2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards:

EPA Response to Comments

United States
Environmental Protection
Agency

2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards:

EPA Response to Comments

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

United States
Environmental Protection
Agency

EPA-420-R-12-017
August 2012

Introduction

The following is the Environmental Protection Agency's (EPA) Response to Comments document for the EPA and National Highway Traffic Safety Administration (NHTSA) Joint Rulemaking: 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards. The following document contains verbatim excerpts of the commenter's text followed by EPA's responses. Citizen comments that raised unique substantive issues are included. In addition, nearly 300,000 citizens provided comments in support of the program and about 400 people provided testimony at three public hearings held for the rulemaking; these comments are not listed or summarized individually, but rather examples are provided. All of the comments and public hearing transcripts are available in docket EPA-HQ-OAR-2010-0799 and/or NHTSA-2010-0131. The comments and responses are organized by topic (see Table of Contents) to help the reader find comments and responses of interest. An index of commenters and the associated docket numbers is also provided.

This is an EPA document and does not contain NHTSA's responses to comments. NHTSA's responses to comments are contained in the preamble Section IV and the NHTSA Final Regulatory Impact Analysis (RIA) for the rule.

Contents

Index of Commenters

Commenter	Docket ID
25x"25 Alliance	EPA-HQ-OAR-2010-0799-11818
AAA	EPA-HQ-OAR-2010-0799-9484-A1, EPA-HQ-OAR-2010-0799-9484
Adams, G.	EPA-HQ-OAR-2010-0799-1550-A1, EPA-HQ-OAR-2010-0799-1550
Addam, Mary	NHTSA-2010-0131-0208
Alexandria Hyundai	EPA-HQ-OAR-2010-0799-11788
Alliance of Automobile Manufacturers	EPA-HQ-OAR-2010-0799-9487-A1, EPA-HQ-OAR-2010-0799-9487, EPA-HQ-OAR-2010-0799-10153-A1, EPA-HQ-OAR-2010-0799-10153-A2, EPA-HQ-OAR-2010-0799-10153, EPA-HQ-OAR-2010-0799-11790-A1, EPA-HQ-OAR-2010-0799-11790, EPA-HQ-OAR-2010-0799-11786, NHTSA-2010-0131-0262-A1, NHTSA-2010-0131-0262, NHTSA-2010-0131-0271-A1, NHTSA-2010-0131-0271, NHTSA-2010-0131-0272-A1, NHTSA-2010-0131-0272
Aluminum Association's Aluminum Transportation Group	EPA-HQ-OAR-2010-0799-11786, NHTSA-2010-0131-0226-A1, NHTSA-2010-0131-0226-A2, NHTSA-2010-0131-0226-A3, NHTSA-2010-0131-0226-A4, NHTSA-2010-0131-0226-A5, NHTSA-2010-0131-0226-A6, NHTSA-2010-0131-0226
America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)	EPA-HQ-OAR-2010-0799-9548-A1, EPA-HQ-OAR-2010-0799-9548-A2, EPA-HQ-OAR-2010-0799-9548
American Chemistry Council (ACC)	EPA-HQ-OAR-2010-0799-9517-A1, EPA-HQ-OAR-2010-0799-9517-A2, EPA-HQ-OAR-2010-0799-9517, EPA-HQ-OAR-2010-0799-11786
American Clean Skies Foundation (ACSF)	EPA-HQ-OAR-2010-0799-9464-A1, EPA-HQ-OAR-2010-0799-9464
American Council for an Energy-Efficient Economy (ACEEE)	EPA-HQ-OAR-2010-0799-9528-A1, EPA-HQ-OAR-2010-0799-9528, EPA-HQ-OAR-2010-0799-9528-A2x, EPA-HQ-OAR-2010-0799-11787
American Council on Renewable Energy (ACORE) and Biomass Coordinating Council (BCC)	EPA-HQ-OAR-2010-0799-9593-A1, EPA-HQ-OAR-2010-0799-9593-A2, EPA-HQ-OAR-2010-0799-9593
American Forest and Paper Association & American Wood Council	EPA-HQ-OAR-2010-0799-9537-A1, EPA-HQ-OAR-2010-0799-9537
American Fuel and Petrochemical Manufacturers (AFPM)	EPA-HQ-OAR-2010-0799-9485-A1, EPA-HQ-OAR-2010-0799-9485
American Honda Motor Co., Inc.	EPA-HQ-OAR-2010-0799-9489-A1, EPA-HQ-OAR-2010-0799-9489, EPA-HQ-OAR-2010-0799-11786, NHTSA-2010-0131-0239-A1, NHTSA-2010-0131-0239
American Iron and Steel Institute (AISI)	EPA-HQ-OAR-2010-0799-9477-A1, EPA-HQ-OAR-2010-0799-9477, EPA-HQ-OAR-2010-0799-11786
American Lung Association	EPA-HQ-OAR-2010-0799-9902-A1, EPA-HQ-OAR-2010-0799-9902-A2, EPA-HQ-OAR-2010-0799-9902
American Lung Association of the Mid-Atlantic	EPA-HQ-OAR-2010-0799-11788
American Medical Association of California	EPA-HQ-OAR-2010-0799-11787
American Petroleum Institute (API)	EPA-HQ-OAR-2010-0799-9469-A1, EPA-HQ-OAR-2010-0799-9469-A2, EPA-HQ-OAR-2010-0799-9469, NHTSA-2010-0131-0238-A1, NHTSA-2010-0131-0238-A2, NHTSA-2010-0131-0238
American Petroleum Institute (API), National Association of Manufacturers (NAM), and American Fuel &	EPA-HQ-OAR-2010-0799-9509-A1, EPA-HQ-OAR-2010-0799-9509

Commenter	Docket ID
Petrochemical Manufacturers (AFPM)	
American Public Gas Association (APGA)	EPA-HQ-OAR-2010-0799-9448-A1x, EPA-HQ-OAR-2010-0799-9448
American Road & Transportation Builders Association (ARTBA)	EPA-HQ-OAR-2010-0799-9403-A1, EPA-HQ-OAR-2010-0799-9403, EPA-HQ-OAR-2010-0799-9451-A1, EPA-HQ-OAR-2010-0799-9451-A2, EPA-HQ-OAR-2010-0799-9451, NHTSA-2010-0131-0233-A1, NHTSA-2010-0131-0233
American Suzuki Motor Corporation	EPA-HQ-OAR-2010-0799-9523-A1, EPA-HQ-OAR-2010-0799-9523
AMP Electric Vehicles	EPA-HQ-OAR-2010-0799-7984-A1, EPA-HQ-OAR-2010-0799-7984, EPA-HQ-OAR-2010-0799-8086-A1x, EPA-HQ-OAR-2010-0799-8086
Anonymous public citizen 4	EPA-HQ-OAR-2010-0799-10317
Anonymous Public Citizen 1	NHTSA-2010-0131-0231
Anonymous public citizen 2	EPA-HQ-OAR-2010-0799-1359
Anonymous public citizen 3	EPA-HQ-OAR-2010-0799-2001
Anonymous public citizen 5	EPA-HQ-OAR-2010-0799-2010
Applied Materials	EPA-HQ-OAR-2010-0799-7292-A1, EPA-HQ-OAR-2010-0799-7292-A2, EPA-HQ-OAR-2010-0799-7292, EPA-HQ-OAR-2010-0799-11787
Arkema Inc.	EPA-HQ-OAR-2010-0799-9468-A1, EPA-HQ-OAR-2010-0799-9468
Association of Global Automakers, Inc. (Global Automakers)	EPA-HQ-OAR-2010-0799-1307-A1, EPA-HQ-OAR-2010-0799-1307, EPA-HQ-OAR-2010-0799-9466-A1, EPA-HQ-OAR-2010-0799-9466, EPA-HQ-OAR-2010-0799-11786, EPA-HQ-OAR-2010-0799-11787, NHTSA-2010-0131-0237-A1, NHTSA-2010-0131-0237
Aston Martin Lagonda Limited, Lotus Cars Limited and McLaren Automotive	EPA-HQ-OAR-2010-0799-5387-A1, EPA-HQ-OAR-2010-0799-5387-A2, EPA-HQ-OAR-2010-0799-5387, EPA-HQ-OAR-2010-0799-11787
Axford, H.	EPA-HQ-OAR-2010-0799-9149-A1, EPA-HQ-OAR-2010-0799-9149
Bassett, S.	EPA-HQ-OAR-2010-0799-8123-A1, EPA-HQ-OAR-2010-0799-8123
Bayer MaterialScience	EPA-HQ-OAR-2010-0799-9198-A1, EPA-HQ-OAR-2010-0799-9198-A2, EPA-HQ-OAR-2010-0799-9198, EPA-HQ-OAR-2010-0799-9265-A1, EPA-HQ-OAR-2010-0799-9265, EPA-HQ-OAR-2010-0799-11786, NHTSA-2010-0131-0228-A1, NHTSA-2010-0131-0228
Biery-Hamilton, Dr. G.	EPA-HQ-OAR-2010-0799-9033-A1, EPA-HQ-OAR-2010-0799-9033
BlueGreen Alliance	EPA-HQ-OAR-2010-0799-11786,EPA-HQ-OAR-2010-0799-11787
BMW of North America, LLC	EPA-HQ-OAR-2010-0799-9579-A1, EPA-HQ-OAR-2010-0799-9579, EPA-HQ-OAR-2010-0799-11788, NHTSA-2010-0131-0251-A1, NHTSA-2010-0131-0251
Borg Warner, Inc.	EPA-HQ-OAR-2010-0799-9320-A1, EPA-HQ-OAR-2010-0799-9320
Bosch	EPA-HQ-OAR-2010-0799-9462-A1, EPA-HQ-OAR-2010-0799-9462
Boyden Gray & Associates PLLC	EPA-HQ-OAR-2010-0799-9506-A1, EPA-HQ-OAR-2010-0799-9506, NHTSA-2010-0131-0242-A1, NHTSA-2010-0131-0242
Business for Innovative Climate & Energy Policy (BICEP)	EPA-HQ-OAR-2010-0799-9450-A1, EPA-HQ-OAR-2010-0799-9450
Cafagna, R.	EPA-HQ-OAR-2010-0799-11689-A1, EPA-HQ-OAR-2010-0799-11689
California Air Resources Board (CARB)	EPA-HQ-OAR-2010-0799-9491-A1, EPA-HQ-OAR-2010-0799-9491, EPA-HQ-OAR-2010-0799-11799-A1, EPA-HQ-OAR-2010-0799-11799-A2, EPA-HQ-OAR-2010-0799-11799, EPA-HQ-OAR-2010-0799-11787
California Manufacturers & Technology Association (CMTA)	EPA-HQ-OAR-2010-0799-9536-A1, EPA-HQ-OAR-2010-0799-9536-A2, EPA-HQ-OAR-2010-0799-9536, EPA-HQ-OAR-2010-0799-10012-A1, EPA-HQ-OAR-2010-0799-10012-A2, EPA-HQ-OAR-2010-0799-10012, NHTSA-2010-0131-0252-A1, NHTSA-2010-0131-0252
California State Sheriffs' Association	

Commenter	Docket ID
(CSSA), California Police Chiefs Association (CPCA), California Narcotic Officers' Association (CNOA)	EPA-HQ-OAR-2010-0799-9488-A1, EPA-HQ-OAR-2010-0799-9488
Capozzelli, J.	NHTSA-2010-0131-0221-A1, NHTSA-2010-0131-0221, NHTSA-2010-0131-0266-A1, NHTSA-2010-0131-0266
Center for Biological Diversity	EPA-HQ-OAR-2010-0799-9479-A1, EPA-HQ-OAR-2010-0799-9479, EPA-HQ-OAR-2010-0799-11787, NHTSA-2010-0131-0255-A1, NHTSA-2010-0131-0255-A2, NHTSA-2010-0131-0255-A3, NHTSA-2010-0131-0255-A4, NHTSA-2010-0131-0255
Center for Sustainable Systems, University of Michigan	EPA-HQ-OAR-2010-0799-9493-A1, EPA-HQ-OAR-2010-0799-9493
CEO Pipe Organs/Golden Ponds Farm	EPA-HQ-OAR-2010-0799-9229-A1, EPA-HQ-OAR-2010-0799-9229
Ceres	EPA-HQ-OAR-2010-0799-9475-A1, EPA-HQ-OAR-2010-0799-9475-A2.pptx, EPA-HQ-OAR-2010-0799-9475, EPA-HQ-OAR-2010-0799-11798-A1, EPA-HQ-OAR-2010-0799-11798, EPA-HQ-OAR-2010-0799-11787
Chrysler Group LLC	EPA-HQ-OAR-2010-0799-9495-A1, EPA-HQ-OAR-2010-0799-9495, EPA-HQ-OAR-2010-0799-11786, EPA-HQ-OAR-2010-0799-11787, EPA-HQ-OAR-2010-0799-11788, NHTSA-2010-0131-0241-A1, NHTSA-2010-0131-0241
Clean Energy	EPA-HQ-OAR-2010-0799-9511-A1, EPA-HQ-OAR-2010-0799-9511, NHTSA-2010-0131-0257-A1, NHTSA-2010-0131-0257
Clean Fuels Development Coalition (CDFC)	EPA-HQ-OAR-2010-0799-9574-A10, EPA-HQ-OAR-2010-0799-9574-A11, EPA-HQ-OAR-2010-0799-9574-A12, EPA-HQ-OAR-2010-0799-9574-A14, EPA-HQ-OAR-2010-0799-9574-A2, EPA-HQ-OAR-2010-0799-9574-A3, EPA-HQ-OAR-2010-0799-9574-A4, EPA-HQ-OAR-2010-0799-9574-A5, EPA-HQ-OAR-2010-0799-9574-A6, EPA-HQ-OAR-2010-0799-9574-A7, EPA-HQ-OAR-2010-0799-9574-A8, EPA-HQ-OAR-2010-0799-9574-A1, EPA-HQ-OAR-2010-0799-9574
Climate Institute	EPA-HQ-OAR-2010-0799-7944-A1, EPA-HQ-OAR-2010-0799-7944
Competitive Enterprise Institute (CEI)	EPA-HQ-OAR-2010-0799-9552-A1, EPA-HQ-OAR-2010-0799-9552
Consumer Federation of America (CFA)	EPA-HQ-OAR-2010-0799-9419-A1, EPA-HQ-OAR-2010-0799-9419-A2, EPA-HQ-OAR-2010-0799-9419-A3, EPA-HQ-OAR-2010-0799-9419-A4, EPA-HQ-OAR-2010-0799-9419, EPA-HQ-OAR-2010-0799-11786, EPA-HQ-OAR-2010-0799-11787, EPA-HQ-OAR-2010-0799-11788
Consumer Reports	EPA-HQ-OAR-2010-0799-11788
Consumers Union	EPA-HQ-OAR-2010-0799-9454-A1, EPA-HQ-OAR-2010-0799-9454-A2, EPA-HQ-OAR-2010-0799-9454-A3, EPA-HQ-OAR-2010-0799-9454
Crime Victims United of California (CVUC)	EPA-HQ-OAR-2010-0799-9883-A1, EPA-HQ-OAR-2010-0799-9883, NHTSA-2010-0131-0254-A1, NHTSA-2010-0131-0254
CTIA - The Wireless Association	EPA-HQ-OAR-2010-0799-11759-A1, EPA-HQ-OAR-2010-0799-11759-A2, EPA-HQ-OAR-2010-0799-11759
Cuenca, M.	EPA-HQ-OAR-2010-0799-10142-A1, EPA-HQ-OAR-2010-0799-10142
Dawid, I.	EPA-HQ-OAR-2010-0799-6325-A1, EPA-HQ-OAR-2010-0799-6325
Defour Group LLC	EPA-HQ-OAR-2010-0799-9319-A1, EPA-HQ-OAR-2010-0799-9319
Delphi Corporation	EPA-HQ-OAR-2010-0799-11786
Denso International America, Inc.	EPA-HQ-OAR-2010-0799-9269-A1, EPA-HQ-OAR-2010-0799-9269, NHTSA-2010-0131-0232-A1, NHTSA-2010-0131-0232
Detroit NAACP	EPA-HQ-OAR-2010-0799-11786
E100 Ethanol Group	EPA-HQ-OAR-2010-0799-7173-A1, EPA-HQ-OAR-2010-0799-7173, EPA-HQ-OAR-2010-0799-11787

Commenter	Docket ID
Eaton Corporation	EPA-HQ-OAR-2010-0799-9494-A1, EPA-HQ-OAR-2010-0799-9494, EPA-HQ-OAR-2010-0799-11786
Ecology Center	EPA-HQ-OAR-2010-0799-11786
EcoMotors International, Inc.	EPA-HQ-OAR-2010-0799-9594-A1, EPA-HQ-OAR-2010-0799-9594-A2, EPA-HQ-OAR-2010-0799-9594
Edison Electric Institute (EEI)	EPA-HQ-OAR-2010-0799-9584-A1, EPA-HQ-OAR-2010-0799-9584-A2, EPA-HQ-OAR-2010-0799-9584
Edmunds.com	EPA-HQ-OAR-2010-0799-11787
Electric Drive Transportation Association	EPA-HQ-OAR-2010-0799-9449-A1, EPA-HQ-OAR-2010-0799-9449
Encana Natural Gas Inc.	EPA-HQ-OAR-2010-0799-9585-A1, EPA-HQ-OAR-2010-0799-9585-A2, EPA-HQ-OAR-2010-0799-9585, NHTSA-2010-0131-0265-A1, NHTSA-2010-0131-0265
Enhanced Protective Glass Automotive Association (EPGAA)	EPA-HQ-OAR-2010-0799-9301-A1, EPA-HQ-OAR-2010-0799-9301
Ennis, M.	EPA-HQ-OAR-2010-0799-5612-A1, EPA-HQ-OAR-2010-0799-5612
Environmental Consultants of Michigan	EPA-HQ-OAR-2010-0799-11760-A1, EPA-HQ-OAR-2010-0799-11760-A2, EPA-HQ-OAR-2010-0799-11760, NHTSA-2010-0131-0166-A1, NHTSA-2010-0131-0166
Environmental Defense Fund (EDF)	EPA-HQ-OAR-2010-0799-9519-A1, EPA-HQ-OAR-2010-0799-9519-A2, EPA-HQ-OAR-2010-0799-9519-A3, EPA-HQ-OAR-2010-0799-9519, EPA-HQ-OAR-2010-0799-11787, EPA-HQ-OAR-2010-0799-11788
EutecticSolutions Inc.	NHTSA-2010-0131-0270
Faria, R.	EPA-HQ-OAR-2010-0799-9834-A1, EPA-HQ-OAR-2010-0799-9834
Feinstein, C.	EPA-HQ-OAR-2010-0799-6745-A1, EPA-HQ-OAR-2010-0799-6745
Ferrari	EPA-HQ-OAR-2010-0799-9535-A1, EPA-HQ-OAR-2010-0799-9535-A2, EPA-HQ-OAR-2010-0799-9535, EPA-HQ-OAR-2010-0799-10037-A1, EPA-HQ-OAR-2010-0799-10037-A2, EPA-HQ-OAR-2010-0799-10037
Ferrari & Maserati of Seattle	EPA-HQ-OAR-2010-0799-9197-A1, EPA-HQ-OAR-2010-0799-9197-A2, EPA-HQ-OAR-2010-0799-9197
Ferrari of Houston, Texas and Ferrari of Austin, Texas	EPA-HQ-OAR-2010-0799-9230-A1, EPA-HQ-OAR-2010-0799-9230-A2, EPA-HQ-OAR-2010-0799-9230
Fisker Automotive, Inc.	EPA-HQ-OAR-2010-0799-9266-A1, EPA-HQ-OAR-2010-0799-9266
Ford Motor Company	EPA-HQ-OAR-2010-0799-9463-A1, EPA-HQ-OAR-2010-0799-9463, EPA-HQ-OAR-2010-0799-11786, EPA-HQ-OAR-2010-0799-11787, EPA-HQ-OAR-2010-0799-11788, NHTSA-2010-0131-0235-A1, NHTSA-2010-0131-0235
Garmin International Inc.	EPA-HQ-OAR-2010-0799-9508-A1, EPA-HQ-OAR-2010-0799-9508, NHTSA-2010-0131-0245-A1, NHTSA-2010-0131-0245
General Motors Company	EPA-HQ-OAR-2010-0799-9465-A1, EPA-HQ-OAR-2010-0799-9465, EPA-HQ-OAR-2010-0799-11786, NHTSA-2010-0131-0236-A1, NHTSA-2010-0131-0236
Gilles, B.	EPA-HQ-OAR-2010-0799-8065-A1, EPA-HQ-OAR-2010-0799-8065
Gordon, Michael	EPA-HQ-OAR-2010-0799-9625
Governors' Biofuels Coalition	EPA-HQ-OAR-2010-0799-9570-A1, EPA-HQ-OAR-2010-0799-9570
Green, K.	EPA-HQ-OAR-2010-0799-1524-A1, EPA-HQ-OAR-2010-0799-1524
Growth Energy	EPA-HQ-OAR-2010-0799-9540-A1, EPA-HQ-OAR-2010-0799-9540-A2, EPA-HQ-OAR-2010-0799-9540, EPA-HQ-OAR-2010-0799-9505-A1, EPA-HQ-OAR-2010-0799-9505-A10, EPA-HQ-OAR-2010-0799-9505-A13, EPA-HQ-OAR-2010-0799-9505-A14, EPA-HQ-OAR-2010-0799-9505-A15, EPA-HQ-OAR-2010-0799-9505-A17, EPA-HQ-OAR-2010-

Commenter	Docket ID
	0799-9505-A19, EPA-HQ-OAR-2010-0799-9505-A20, EPA-HQ-OAR-2010-0799-9505-A23, EPA-HQ-OAR-2010-0799-9505-A24, EPA-HQ-OAR-2010-0799-9505-A3, EPA-HQ-OAR-2010-0799-9505-A8, EPA-HQ-OAR-2010-0799-9505-A9, EPA-HQ-OAR-2010-0799-9505
Guardian Automotive Products, Inc.	EPA-HQ-OAR-2010-0799-9299-A1, EPA-HQ-OAR-2010-0799-9299
Haroldson, C.	EPA-HQ-OAR-2010-0799-11137-A1, EPA-HQ-OAR-2010-0799-11137
Hohenstein, H.	EPA-HQ-OAR-2010-0799-1515-A1, EPA-HQ-OAR-2010-0799-1515
Honeywell International, Inc.	EPA-HQ-OAR-2010-0799-9497-A1, EPA-HQ-OAR-2010-0799-9497, EPA-HQ-OAR-2010-0799-11786, EPA-HQ-OAR-2010-0799-11788, NHTSA-2010-0131-0244-A1, NHTSA-2010-0131-0244
Honeywell Transportation Systems	EPA-HQ-OAR-2010-0799-9474-A1, EPA-HQ-OAR-2010-0799-9474
Horst, R.	EPA-HQ-OAR-2010-0799-6353-A1, EPA-HQ-OAR-2010-0799-6353
House of Representatives, Congress of the United States	EPA-HQ-OAR-2010-0799-1221-A1, EPA-HQ-OAR-2010-0799-1221
Houston Tea Party Society	EPA-HQ-OAR-2010-0799-9583
Howard, P.	EPA-HQ-OAR-2010-0799-10063-A1, EPA-HQ-OAR-2010-0799-11384-A1, EPA-HQ-OAR-2010-0799-10063, EPA-HQ-OAR-2010-0799-11384
Hrin, S.	EPA-HQ-OAR-2010-0799-1568
Hyundai America Technical Center	EPA-HQ-OAR-2010-0799-9542-A1, EPA-HQ-OAR-2010-0799-9542, EPA-HQ-OAR-2010-0799-9547-A1, EPA-HQ-OAR-2010-0799-9547, EPA-HQ-OAR-2010-0799-11786, EPA-HQ-OAR-2010-0799-11787, EPA-HQ-OAR-2010-0799-11788, NHTSA-2010-0131-0250-A1, NHTSA-2010-0131-0250
ICM Inc.	EPA-HQ-OAR-2010-0799-9541-A1, EPA-HQ-OAR-2010-0799-9541-A2, EPA-HQ-OAR-2010-0799-9541
Institute for Energy Research (IER)	EPA-HQ-OAR-2010-0799-9573-A1, EPA-HQ-OAR-2010-0799-9573
Institute for Policy Integrity, New York University School of Law	EPA-HQ-OAR-2010-0799-9480-A1, EPA-HQ-OAR-2010-0799-9480-A2, EPA-HQ-OAR-2010-0799-9480-A3, EPA-HQ-OAR-2010-0799-9480-A4, EPA-HQ-OAR-2010-0799-9480, EPA-HQ-OAR-2010-0799-11485-A1, EPA-HQ-OAR-2010-0799-11485-A2, EPA-HQ-OAR-2010-0799-11485-A3, EPA-HQ-OAR-2010-0799-11485-A4, EPA-HQ-OAR-2010-0799-11485-A5, EPA-HQ-OAR-2010-0799-11485
Insurance Institute for Highway Safety (IIHS)	NHTSA-2010-0131-0222-A1, NHTSA-2010-0131-0222
Integrated Consultants, Inc.	NHTSA-2010-0131-0217-A1, NHTSA-2010-0131-0217
International Council on Clean Transportation (ICCT)	EPA-HQ-OAR-2010-0799-9364-A1, EPA-HQ-OAR-2010-0799-9364-A2, EPA-HQ-OAR-2010-0799-9364, EPA-HQ-OAR-2010-0799-9365-A1, EPA-HQ-OAR-2010-0799-9365, EPA-HQ-OAR-2010-0799-9512-A1, EPA-HQ-OAR-2010-0799-9512, EPA-HQ-OAR-2010-0799-11786, EPA-HQ-OAR-2010-0799-11787, NHTSA-2010-0131-0225-A1, NHTSA-2010-0131-0225-A2, NHTSA-2010-0131-0225, NHTSA-2010-0131-0227-A1, NHTSA-2010-0131-0227, NHTSA-2010-0131-0258-A1, NHTSA-2010-0131-0258
Investor Network on Climate Risk (INCR) - Ceres	EPA-HQ-OAR-2010-0799-9516-A1x, EPA-HQ-OAR-2010-0799-9516
Jackson, F.W.	EPA-HQ-OAR-2010-0799-7113-A1, EPA-HQ-OAR-2010-0799-7113, EPA-HQ-OAR-2010-0799-8041-A1, EPA-HQ-OAR-2010-0799-8041, EPA-HQ-OAR-2010-0799-11785-A1, EPA-HQ-OAR-2010-0799-11785
Jaguar Land Rover North America, LLC (JLRNA)	EPA-HQ-OAR-2010-0799-8102-A1, EPA-HQ-OAR-2010-0799-8102
Johnson Controls, Inc.	NHTSA-2010-0131-0253-A1, NHTSA-2010-0131-0253
Johnson, C.	EPA-HQ-OAR-2010-0799-6528-A1, EPA-HQ-OAR-2010-0799-6528

Commenter	Docket ID
Jordon, A.	EPA-HQ-OAR-2010-0799-9857-A1, EPA-HQ-OAR-2010-0799-9857
Kendall, A.	EPA-HQ-OAR-2010-0799-11787
Kia Motors	EPA-HQ-OAR-2010-0799-11786
Knapp, B.	EPA-HQ-OAR-2010-0799-8255-A1, EPA-HQ-OAR-2010-0799-8255
Kobus, D.	EPA-HQ-OAR-2010-0799-1370-A1, EPA-HQ-OAR-2010-0799-1370
Kunz, R. and J.	EPA-HQ-OAR-2010-0799-9562-A1, EPA-HQ-OAR-2010-0799-9562
Leach, Kyle	EPA-HQ-OAR-2010-0799-9626
League of Women Voters of Michigan	NHTSA-2010-0131-0198
Lennon, S.	EPA-HQ-OAR-2010-0799-9019-A1, EPA-HQ-OAR-2010-0799-9019
Links, W.	EPA-HQ-OAR-2010-0799-10348-A1, EPA-HQ-OAR-2010-0799-10348
Lipetzky, P.	EPA-HQ-OAR-2010-0799-8184-A1, EPA-HQ-OAR-2010-0799-8184
Magna E-Car Systems	EPA-HQ-OAR-2010-0799-9263-A1, EPA-HQ-OAR-2010-0799-9263
Manufacturers of Emission Controls Association (MECA)	EPA-HQ-OAR-2010-0799-9452-A1, EPA-HQ-OAR-2010-0799-9452-A2, EPA-HQ-OAR-2010-0799-9452-A3, EPA-HQ-OAR-2010-0799-9452, EPA-HQ-OAR-2010-0799-11786
Marks, R.	EPA-HQ-OAR-2010-0799-1680-A1, EPA-HQ-OAR-2010-0799-1680
Marlinghaus, E.	EPA-HQ-OAR-2010-0799-1581-A1, EPA-HQ-OAR-2010-0799-1581
Marshall, C.	EPA-HQ-OAR-2010-0799-5917-A1, EPA-HQ-OAR-2010-0799-5917-A2, EPA-HQ-OAR-2010-0799-5917
Marz, Loren C.	NHTSA-2010-0131-0213-A1x, NHTSA-2010-0131-0213
Mass Comment Campaign (1,121) (World Wildlife Fund)	EPA-HQ-OAR-2010-0799-5181_MASS
Mass Comment Campaign (1,338) (Sierra Club-2)	EPA-HQ-OAR-2010-0799-11762-A1, EPA-HQ-OAR-2010-0799-11762
Mass Comment Campaign (10) (National Wildlife Federation Action Fund-1)	EPA-HQ-OAR-2010-0799-1244-A1_MASS, EPA-HQ-OAR-2010-0799-1244_MASS
Mass Comment Campaign (13,300) (National Wildlife Federation Action Fund-3)	EPA-HQ-OAR-2010-0799-9965-A1_MASSx, EPA-HQ-OAR-2010-0799-9965_MASS
Mass Comment Campaign (137 (Citizens for Pennsylvania's Future (PennFuture))	EPA-HQ-OAR-2010-0799-3114-A1_MASS, EPA-HQ-OAR-2010-0799-3114_MASS
Mass Comment Campaign (15) (League of Conservation Voters)	EPA-HQ-OAR-2010-0799-1555-A1_MASS, EPA-HQ-OAR-2010-0799-1555_MASS
Mass Comment Campaign (15) (Sierra Club-3)	EPA-HQ-OAR-2010-0799-11763-A1, EPA-HQ-OAR-2010-0799-11763
Mass Comment Campaign (195) (Environment New Mexico-1)	EPA-HQ-OAR-2010-0799-9577-A1_MASS, EPA-HQ-OAR-2010-0799-9577_MASS
Mass Comment Campaign (2,120) (Pew Environmental Group)	EPA-HQ-OAR-2010-0799-1247-A1_MASS, EPA-HQ-OAR-2010-0799-1247_MASS
Mass Comment Campaign (2,156) (Environment Michigan)	EPA-HQ-OAR-2010-0799-9683-A1_MASS, EPA-HQ-OAR-2010-0799-9683_MASS
Mass Comment Campaign (2,851) (Unknown Organization)	EPA-HQ-OAR-2010-0799-9591-A1_MASS, EPA-HQ-OAR-2010-0799-9591_MASS
Mass Comment Campaign (20) (Union of Concerned Scientists-1)	EPA-HQ-OAR-2010-0799-1558-A1_MASS, EPA-HQ-OAR-2010-0799-1558_MASS
Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)	EPA-HQ-OAR-2010-0799-10166-A1_MASS, EPA-HQ-OAR-2010-0799-10166-A2_MASS, EPA-HQ-OAR-2010-0799-10166_MASS
Mass Comment Campaign (213) (Environment Virginia)	EPA-HQ-OAR-2010-0799-9576-A1_MASS, EPA-HQ-OAR-2010-0799-9576_MASS

Commenter	Docket ID
Mass Comment Campaign (22,122) (Unknown Organization)	EPA-HQ-OAR-2010-0799-9736_MASS
Mass Comment Campaign (262) (Environment New Mexico-2)	EPA-HQ-OAR-2010-0799-9700-A1_MASS, EPA-HQ-OAR-2010-0799-9700_MASS
Mass Comment Campaign (27,108) (Unknown Organization)	EPA-HQ-OAR-2010-0799-9596-A1_MASS, EPA-HQ-OAR-2010-0799-9596_MASS
Mass Comment campaign (3,855) (National Wildlife Federation Action Fund-2)	EPA-HQ-OAR-2010-0799-1557-A1_MASS, EPA-HQ-OAR-2010-0799-1557_MASS
Mass Comment Campaign (375) (Union of Concerned Scientists-2)	EPA-HQ-OAR-2010-0799-1246-A1_MASS, EPA-HQ-OAR-2010-0799-1246_MASS
Mass Comment Campaign (39) (Unknown Organization)	EPA-HQ-OAR-2010-0799-1245-A1_MASS, EPA-HQ-OAR-2010-0799-1245_MASS
Mass Comment Campaign (39,464) (Environmental Defense Fund (EDF))	EPA-HQ-OAR-2010-0799-9590-A1_MASS, EPA-HQ-OAR-2010-0799-9590_MASS
Mass Comment Campaign (399) (Rhode Island Sierra Club)	EPA-HQ-OAR-2010-0799-11761-A1, EPA-HQ-OAR-2010-0799-11761
Mass Comment Campaign (4,505) (Unknown Organization)	EPA-HQ-OAR-2010-0799-9595-A1_MASS, EPA-HQ-OAR-2010-0799-9595_MASS
Mass Comment Campaign (45) (Environment Minnesota)	EPA-HQ-OAR-2010-0799-9588-A1_MASS, EPA-HQ-OAR-2010-0799-9588_MASS
Mass Comment Campaign (61) (The Social Justice Group)	EPA-HQ-OAR-2010-0799-7406-A1_MASS, EPA-HQ-OAR-2010-0799-7406_MASS
Mass Comment Campaign (680) (PennEvironment)	EPA-HQ-OAR-2010-0799-1556-A1_MASS, EPA-HQ-OAR-2010-0799-1556_MASS
Mass Comment Campaign (8,741) (Natural Resources Defense Council (NRDC))	EPA-HQ-OAR-2010-0799-9589-A1_MASS, EPA-HQ-OAR-2010-0799-9589_MASS
Mass Comment Campaign (80) (Unknown Organization)	EPA-HQ-OAR-2010-0799-9682-A1_MASS, EPA-HQ-OAR-2010-0799-9682_MASS
Mass Comment Campaign (9,570) (Unknown Organization)	EPA-HQ-OAR-2010-0799-9578-A1_MASS, EPA-HQ-OAR-2010-0799-9578_MASS
Mass Comment Campaign (927) (Sierra Club-1)	EPA-HQ-OAR-2010-0799-1554-A1_MASS, EPA-HQ-OAR-2010-0799-1554_MASS
Mass Comment Campaign (99) (Environment Texas)	EPA-HQ-OAR-2010-0799-9701-A1_MASS, EPA-HQ-OAR-2010-0799-9701_MASS
Mass Comment Campaign (Multiple Submitters) (Unknown Organization)	NHTSA-2010-0131-0219-A1_MASS, NHTSA-2010-0131-0219_MASS
Massachusetts Institute of Technology (MIT)	NHTSA-2010-0131-0229-A1, NHTSA-2010-0131-0229
Mazda North American Operations	EPA-HQ-OAR-2010-0799-11787
Medinger, R.	EPA-HQ-OAR-2010-0799-9035-A1, EPA-HQ-OAR-2010-0799-9035
Mehrotra, Rahul	NHTSA-2010-0131-0206
Mercedes-Benz USA, LLC	EPA-HQ-OAR-2010-0799-9483-A1, EPA-HQ-OAR-2010-0799-9483
Michigan House of Representatives, 49th District	EPA-HQ-OAR-2010-0799-7983-A1, EPA-HQ-OAR-2010-0799-7983
Michigan State House of Representatives	EPA-HQ-OAR-2010-0799-9175
Michigan State Senate, District 18	EPA-HQ-OAR-2010-0799-5594-A1x, EPA-HQ-OAR-2010-0799-5594-A1, EPA-HQ-OAR-2010-0799-5594
Miller Motorcars	EPA-HQ-OAR-2010-0799-8141-A1, EPA-HQ-OAR-2010-0799-8141-A2,

Commenter	Docket ID
	EPA-HQ-OAR-2010-0799-8141
Miller, P.	EPA-HQ-OAR-2010-0799-1755-A1, EPA-HQ-OAR-2010-0799-1755
Minnesota Department of Commerce	EPA-HQ-OAR-2010-0799-7363-A1x, EPA-HQ-OAR-2010-0799-7363
Mitsubishi Motors R&D of America, Inc. (MRDA)	EPA-HQ-OAR-2010-0799-9507-A1, EPA-HQ-OAR-2010-0799-9507, EPA-HQ-OAR-2010-0799-11787
Moravian College	EPA-HQ-OAR-2010-0799-5536-A1, EPA-HQ-OAR-2010-0799-5536
Motor & Equipment Manufacturers Association (MEMA)	EPA-HQ-OAR-2010-0799-9478-A1, EPA-HQ-OAR-2010-0799-9478
National Alliance of Forest Owners (NAFO)	EPA-HQ-OAR-2010-0799-9481-A1, EPA-HQ-OAR-2010-0799-9481, EPA-HQ-OAR-2010-0799-9534-A1, EPA-HQ-OAR-2010-0799-9534-A2, EPA-HQ-OAR-2010-0799-9534
National Association of Clean Air Agencies (NACAA)	EPA-HQ-OAR-2010-0799-8084-A1, EPA-HQ-OAR-2010-0799-8084, EPA-HQ-OAR-2010-0799-11787, EPA-HQ-OAR-2010-0799-11788
National Association of Convenience Stores (NACS)	EPA-HQ-OAR-2010-0799-9543-A1, EPA-HQ-OAR-2010-0799-9543
National Association of Manufacturers (NAM)	EPA-HQ-OAR-2010-0799-9538-A1, EPA-HQ-OAR-2010-0799-9538-A2, EPA-HQ-OAR-2010-0799-9538, EPA-HQ-OAR-2010-0799-9587-A1, EPA-HQ-OAR-2010-0799-9587
National Automobile Dealers Association (NADA)	EPA-HQ-OAR-2010-0799-1308-A1, EPA-HQ-OAR-2010-0799-1308, EPA-HQ-OAR-2010-0799-9575-A1, EPA-HQ-OAR-2010-0799-9575-A2, EPA-HQ-OAR-2010-0799-9575-A3, EPA-HQ-OAR-2010-0799-9575-A4, EPA-HQ-OAR-2010-0799-9575-A5, EPA-HQ-OAR-2010-0799-9575, EPA-HQ-OAR-2010-0799-11786, EPA-HQ-OAR-2010-0799-11787, EPA-HQ-OAR-2010-0799-11788, NHTSA-2010-0131-0261-A1, NHTSA-2010-0131-0261-A2, NHTSA-2010-0131-0261-A3, NHTSA-2010-0131-0261-A4, NHTSA-2010-0131-0261-A5, NHTSA-2010-0131-0261, NHTSA-2010-0131-0267-A1, NHTSA-2010-0131-0267
National Caucus of Environmental Legislators	EPA-HQ-OAR-2010-0799-9443-A1, EPA-HQ-OAR-2010-0799-9443
National Corn Growers Association et al.	EPA-HQ-OAR-2010-0799-9565-A1, EPA-HQ-OAR-2010-0799-9565, NHTSA-2010-0131-0249-A1, NHTSA-2010-0131-0249
National Propane Gas Association (NPGA)	EPA-HQ-OAR-2010-0799-9482-A1, EPA-HQ-OAR-2010-0799-9482
National Wildlife Federation (NWF)	EPA-HQ-OAR-2010-0799-9887-A1, EPA-HQ-OAR-2010-0799-9887-A2, EPA-HQ-OAR-2010-0799-9887, EPA-HQ-OAR-2010-0799-11786
Natural Resources Defense Council (NRDC)	EPA-HQ-OAR-2010-0799-9472-A1, EPA-HQ-OAR-2010-0799-9472-A2, EPA-HQ-OAR-2010-0799-9472, EPA-HQ-OAR-2010-0799-11786
Necheles, L.	EPA-HQ-OAR-2010-0799-2487-A1, EPA-HQ-OAR-2010-0799-2487
New Jersey Senate, Third Legislative District	EPA-HQ-OAR-2010-0799-9970-A1, EPA-HQ-OAR-2010-0799-9970
New York City Council, 35th District	EPA-HQ-OAR-2010-0799-9901-A1, EPA-HQ-OAR-2010-0799-9901-A2, EPA-HQ-OAR-2010-0799-9901
New York State Assembly Committee on Government Operations	EPA-HQ-OAR-2010-0799-9453-A1, EPA-HQ-OAR-2010-0799-9453-A2, EPA-HQ-OAR-2010-0799-9453
New York State Senate, 26th District	EPA-HQ-OAR-2010-0799-9884-A1, EPA-HQ-OAR-2010-0799-9884
NGV America	EPA-HQ-OAR-2010-0799-9461-A1, EPA-HQ-OAR-2010-0799-9461, NHTSA-2010-0131-0234-A1, NHTSA-2010-0131-0234
Nissan North America, Inc.	EPA-HQ-OAR-2010-0799-9471-A1, EPA-HQ-OAR-2010-0799-9471, EPA-HQ-OAR-2010-0799-11786
Northeast States for Coordinated Air Use Management (NESCAUM)	EPA-HQ-OAR-2010-0799-9476-A1, EPA-HQ-OAR-2010-0799-9476, EPA-HQ-OAR-2010-0799-11788
Oblong Land Conservancy	EPA-HQ-OAR-2010-0799-9915-A1, EPA-HQ-OAR-2010-0799-9915

Commenter	Docket ID
Pacific Legal Foundation (PLF)	EPA-HQ-OAR-2010-0799-8108-A1, EPA-HQ-OAR-2010-0799-8108
Parker, M.	EPA-HQ-OAR-2010-0799-9017-A1, EPA-HQ-OAR-2010-0799-9017
Paul, M.	EPA-HQ-OAR-2010-0799-9027-A1, EPA-HQ-OAR-2010-0799-9027
Pearce, F.	EPA-HQ-OAR-2010-0799-10343-A1, EPA-HQ-OAR-2010-0799-10343
Pennsylvania Department of Environmental Protection	EPA-HQ-OAR-2010-0799-7821-A1, EPA-HQ-OAR-2010-0799-7821
Pennsylvania State Senate et al.	EPA-HQ-OAR-2010-0799-9914-A1, EPA-HQ-OAR-2010-0799-9914
Penske Corporation	EPA-HQ-OAR-2010-0799-9187-A1, EPA-HQ-OAR-2010-0799-9187-A2, EPA-HQ-OAR-2010-0799-9187
Pew Charitable Trusts	EPA-HQ-OAR-2010-0799-9496-A1, EPA-HQ-OAR-2010-0799-9496-A2x, EPA-HQ-OAR-2010-0799-9496-A3, EPA-HQ-OAR-2010-0799-9496, EPA-HQ-OAR-2010-0799-11788
Pittsburgh Glass Works (PGW)	EPA-HQ-OAR-2010-0799-9300-A1, EPA-HQ-OAR-2010-0799-9300
Plant Oil Powered Diesel Fuel Systems, Inc.	EPA-HQ-OAR-2010-0799-9882-A1, EPA-HQ-OAR-2010-0799-9882, EPA-HQ-OAR-2010-0799-10337-A1, EPA-HQ-OAR-2010-0799-10337-A2, EPA-HQ-OAR-2010-0799-10337, EPA-HQ-OAR-2010-0799-9882-A2, EPA-HQ-OAR-2010-0799-9882-A5, EPA-HQ-OAR-2010-0799-9882-A11, EPA-HQ-OAR-2010-0799-9882-A12, EPA-HQ-OAR-2010-0799-9882-A13, EPA-HQ-OAR-2010-0799-9882-A6, EPA-HQ-OAR-2010-0799-9882-A8, EPA-HQ-OAR-2010-0799-9882-A9, EPA-HQ-OAR-2010-0799-9882-A3
Porsche Cars North America, Inc. (PCNA)	EPA-HQ-OAR-2010-0799-9264-A1, EPA-HQ-OAR-2010-0799-9264, NHTSA-2010-0131-0224-A1, NHTSA-2010-0131-0224
Pregibon, D.	EPA-HQ-OAR-2010-0799-8987-A1, EPA-HQ-OAR-2010-0799-8987
Rafter, M.	EPA-HQ-OAR-2010-0799-11587-A1, EPA-HQ-OAR-2010-0799-11587
Renewable Energy Long Island	EPA-HQ-OAR-2010-0799-7933-A1x, EPA-HQ-OAR-2010-0799-7933
Renewable Fuels Association (RFA)	EPA-HQ-OAR-2010-0799-9490-A1, EPA-HQ-OAR-2010-0799-9490
Ross, D.	EPA-HQ-OAR-2010-0799-11788
Roush Industries, Inc.	EPA-HQ-OAR-2010-0799-7823-A1, EPA-HQ-OAR-2010-0799-7823-A2, EPA-HQ-OAR-2010-0799-7823
RVIA	EPA-HQ-OAR-2010-0799-9550-A1, EPA-HQ-OAR-2010-0799-9550-A2, EPA-HQ-OAR-2010-0799-9550
SABIC Innovative Plastics US LLC	EPA-HQ-OAR-2010-0799-9467-A1, EPA-HQ-OAR-2010-0799-9467, EPA-HQ-OAR-2010-0799-11786
Salinas, A.	EPA-HQ-OAR-2010-0799-7119-A1, EPA-HQ-OAR-2010-0799-7119
Securing America's Future Energy (SAFE)	EPA-HQ-OAR-2010-0799-9518-A1, EPA-HQ-OAR-2010-0799-9518, EPA-HQ-OAR-2010-0799-11787, NHTSA-2010-0131-0259-A1, NHTSA-2010-0131-0259
Shick, R.	EPA-HQ-OAR-2010-0799-6215-A1, EPA-HQ-OAR-2010-0799-6215
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council	EPA-HQ-OAR-2010-0799-9549-A1, EPA-HQ-OAR-2010-0799-9549-A2, EPA-HQ-OAR-2010-0799-9549-A3, EPA-HQ-OAR-2010-0799-9549, EPA-HQ-OAR-2010-0799-11786
Slemp III, R. L.	EPA-HQ-OAR-2010-0799-6314-A1, EPA-HQ-OAR-2010-0799-6314
Smith, Frank Houston	NHTSA-2010-0131-0240-A1, NHTSA-2010-0131-0240-A2, NHTSA-2010-0131-0240
Smith, G.	EPA-HQ-OAR-2010-0799-8438-A1, EPA-HQ-OAR-2010-0799-8438
Society of the Plastics Industry, Inc. (SPI)	EPA-HQ-OAR-2010-0799-9492-A1, EPA-HQ-OAR-2010-0799-9492
South Coast AQMD	EPA-HQ-OAR-2010-0799-11787
St. Clair-Detroit River Sturgeon for Tomorrow	EPA-HQ-OAR-2010-0799-4151

Commenter	Docket ID
State of New York The Assembly	EPA-HQ-OAR-2010-0799-10155-A1, EPA-HQ-OAR-2010-0799-10155
Statman, P.	EPA-HQ-OAR-2010-0799-1472-A1, EPA-HQ-OAR-2010-0799-1472
Steffanoff, N.	EPA-HQ-OAR-2010-0799-9335-A1, EPA-HQ-OAR-2010-0799-9335
Steyn, R.	EPA-HQ-OAR-2010-0799-8724-A1, EPA-HQ-OAR-2010-0799-8724
Stirling, D.	EPA-HQ-OAR-2010-0799-10065-A1, EPA-HQ-OAR-2010-0799-10065
Sullivan, T.	EPA-HQ-OAR-2010-0799-10341-A1, EPA-HQ-OAR-2010-0799-10341
Susan R.	EPA-HQ-OAR-2010-0799-10792-A1, EPA-HQ-OAR-2010-0799-10792
Tarazevich, Yegor	NHTSA-2010-0131-0199
TechAmerica	EPA-HQ-OAR-2010-0799-9470-A1, EPA-HQ-OAR-2010-0799-9470
Tesla Motors, Inc.	EPA-HQ-OAR-2010-0799-9539-A1, EPA-HQ-OAR-2010-0799-9539-A2, EPA-HQ-OAR-2010-0799-9539, EPA-HQ-OAR-2010-0799-9592-A1, EPA-HQ-OAR-2010-0799-9592, EPA-HQ-OAR-2010-0799-11787, NHTSA-2010-0131-0260-A1, NHTSA-2010-0131-0260
The Catskill Center for Conservation and Development	EPA-HQ-OAR-2010-0799-9913-A1, EPA-HQ-OAR-2010-0799-9913
Toyota Motor North America	EPA-HQ-OAR-2010-0799-9586-A1, EPA-HQ-OAR-2010-0799-9586
U.S. Chamber of Commerce	EPA-HQ-OAR-2010-0799-9521-A1, EPA-HQ-OAR-2010-0799-9521-A2, EPA-HQ-OAR-2010-0799-9521-A3, EPA-HQ-OAR-2010-0799-9521
U.S. Coalition for Advanced Diesel Cars	EPA-HQ-OAR-2010-0799-11786, NHTSA-2010-0131-0246-A1, NHTSA-2010-0131-0246
Union of Concerned Scientists (UCS)	EPA-HQ-OAR-2010-0799-9567-A1, EPA-HQ-OAR-2010-0799-9567-A2, EPA-HQ-OAR-2010-0799-9567, EPA-HQ-OAR-2010-0799-9713-A1, EPA-HQ-OAR-2010-0799-9713-A2, EPA-HQ-OAR-2010-0799-9713, EPA-HQ-OAR-2010-0799-11787, EPA-HQ-OAR-2010-0799-11788
United Automobile Workers (UAW)	EPA-HQ-OAR-2010-0799-9563-A1, EPA-HQ-OAR-2010-0799-9563-A2, EPA-HQ-OAR-2010-0799-9563, EPA-HQ-OAR-2010-0799-11786, NHTSA-2010-0131-0248-A1, NHTSA-2010-0131-0248
United States Senate	NHTSA-2010-0131-0264-A1, NHTSA-2010-0131-0264
United States Steel Corporation	EPA-HQ-OAR-2010-0799-11786, NHTSA-2010-0131-0256-A1, NHTSA-2010-0131-0256
United Steel Workers (USW)	EPA-HQ-OAR-2010-0799-9580-A1, EPA-HQ-OAR-2010-0799-9580-A2, EPA-HQ-OAR-2010-0799-9580
University of Michigan	EPA-HQ-OAR-2010-0799-7986-A1, EPA-HQ-OAR-2010-0799-7986
Utility Air Regulatory Group (UARG)	EPA-HQ-OAR-2010-0799-9510-A1, EPA-HQ-OAR-2010-0799-9510
Van Coppenolle, J. and L.	EPA-HQ-OAR-2010-0799-1284-A1, EPA-HQ-OAR-2010-0799-1284
Van Voorhies, M.	EPA-HQ-OAR-2010-0799-1629-A1, EPA-HQ-OAR-2010-0799-1629
Varley, R.	EPA-HQ-OAR-2010-0799-1948-A1, EPA-HQ-OAR-2010-0799-1948
Vehicle Production Group LLC (VPG)	EPA-HQ-OAR-2010-0799-7985-A1, EPA-HQ-OAR-2010-0799-7985-A2, EPA-HQ-OAR-2010-0799-7985
VNG.Co (VNG)	EPA-HQ-OAR-2010-0799-7941-A1, EPA-HQ-OAR-2010-0799-7941-A2, EPA-HQ-OAR-2010-0799-7941, EPA-HQ-OAR-2010-0799-11797-A1, EPA-HQ-OAR-2010-0799-11797-A2, EPA-HQ-OAR-2010-0799-11797-A3, EPA-HQ-OAR-2010-0799-11797, NHTSA-2010-0131-0218-A1, NHTSA-2010-0131-0218
Volkswagen	EPA-HQ-OAR-2010-0799-1309-A1, EPA-HQ-OAR-2010-0799-1309
Volkswagen Group of America	EPA-HQ-OAR-2010-0799-9569-A1, EPA-HQ-OAR-2010-0799-9569, NHTSA-2010-0131-0247-A1, NHTSA-2010-0131-0247
Volvo Car Corporation (VCC)	EPA-HQ-OAR-2010-0799-9551-A1, EPA-HQ-OAR-2010-0799-9551-A2, EPA-HQ-OAR-2010-0799-9551, NHTSA-2010-0131-0243-A1, NHTSA-2010-0131-0243
Weiner, L.	EPA-HQ-OAR-2010-0799-11787

Commenter	Docket ID
Wenzel, T.	EPA-HQ-OAR-2010-0799-11787
WESPAC Foundation	EPA-HQ-OAR-2010-0799-9459-A1, EPA-HQ-OAR-2010-0799-9459
Whitefoot, K. and Skerlos, S.	EPA-HQ-OAR-2010-0799-9447-A1x, EPA-HQ-OAR-2010-0799-9447
Wide World Ferrari, Wide World of Cars, LLC	EPA-HQ-OAR-2010-0799-8142-A1, EPA-HQ-OAR-2010-0799-8142-A2, EPA-HQ-OAR-2010-0799-8142, EPA-HQ-OAR-2010-0799-9231-A1, EPA-HQ-OAR-2010-0799-9231-A2, EPA-HQ-OAR-2010-0799-9231
World Resources Institute (WRI)	EPA-HQ-OAR-2010-0799-7086-A1, EPA-HQ-OAR-2010-0799-7086-A2, EPA-HQ-OAR-2010-0799-7086
World Steel Association	EPA-HQ-OAR-2010-0799-7766-A1, EPA-HQ-OAR-2010-0799-7766
WorldAutoSteel	EPA-HQ-OAR-2010-0799-7174-A1, EPA-HQ-OAR-2010-0799-7174

1. National Program

1.1. General Support for the National Program

Organizations Included in this Section

Alexandria Hyundai
Alliance of Automobile Manufacturers
Aluminum Association's Aluminum Transportation Group
American Chemistry Council (ACC)
American Council for an Energy-Efficient Economy (ACEEE)
American Honda Motor Co., Inc
American Lung Association
American Lung Association of the Mid-Atlantic
American Medical Association of California
American Suzuki Motor Corporation
Applied Materials
Association of Global Automakers, Inc. (Global Automakers)
Aston Martin Lagonda Limited, Lotus Cars Limited and McLaren Automotive
Biery-Hamilton, Dr. G.
BlueGreen Alliance
BMW of North America, LLC
Borg Warner, Inc.
Business for Innovative Climate & Energy Policy (BICEP)
California Air Resources Board (CARB)
Capozzelli, J.
Center for Biological Diversity
CEO Pipe Organs/Golden Ponds Farm
Ceres
Chrysler Group LLC
Climate Institute
Consumer Federation of America (CFA)
Consumer Reports
Consumers Union
Delphi Corporation
Detroit NAACP
E100 Ethanol Group
Eaton Corporation
Ecology Center
EcoMotors International, Inc.
Edmunds.com
Electric Drive Transportation Association
Environmental Defense Fund (EDF)
Ferrari
Fisker Automotive, Inc.

Ford Motor Company
General Motors Company
Growth Energy
Guardian Automotive Products, Inc.
Honeywell International, Inc.
Honeywell Transportation Systems
House of Representatives, Congress of the United States
Howard, P.
Hyundai America Technical Center
ICM Inc.
Insurance Institute for Highway Safety (IIHS)
International Council on Clean Transportation (ICCT)
Investor Network on Climate Risk (INCR) – Ceres
Jaguar Land Rover North America, LLC (JLRNA)
Johnson Controls, Inc.
Kendall, A.
Kia Motors
Kobus, D.
League of Women Voters of Michigan
Magna E-Car Systems
Manufacturers of Emission Controls Association (MECA)
Marshall, C.
Marz, Loren C.
Mass Comment Campaign (1,121) (World Wildlife Fund)
Mass Comment Campaign (1,338) (Sierra Club-2)
Mass Comment Campaign (13,300) (National Wildlife Federation Action Fund-3)
Mass Comment Campaign (137 (Citizens for Pennsylvania's Future (PennFuture))
Mass Comment Campaign (15) (League of Conservation Voters)
Mass Comment Campaign (15) (Sierra Club-3)
Mass Comment Campaign (195) (Environment New Mexico-1)
Mass Comment Campaign (2,120) (Pew Environmental Group)
Mass Comment Campaign (2,156) (Environment Michigan)
Mass Comment Campaign (2,851) (Unknown Organization)
Mass Comment Campaign (20) (Union of Concerned Scientists-1)
Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)
Mass Comment Campaign (213) (Environment Virginia)
Mass Comment Campaign (22,122) (Unknown Organization)
Mass Comment Campaign (262) (Environment New Mexico-2)
Mass Comment Campaign (27,108) (Unknown Organization
Mass Comment campaign (3,855) (National Wildlife Federation Action Fund-2)
Mass Comment Campaign (375) (Union of Concerned Scientists-2)
Mass Comment Campaign (39) (Unknown Organization)
Mass Comment Campaign (39,464) (Environmental Defense Fund (EDF))
Mass Comment Campaign (399) (Rhode Island Sierra Club)
Mass Comment Campaign (4,505) (Unknown Organization)
Mass Comment Campaign (45) (Environment Minnesota)

Mass Comment Campaign (61) (The Social Justice Group)
Mass Comment Campaign (680) (PennEvironment)
Mass Comment Campaign (80) (Unknown Organization)
Mass Comment Campaign (9,570) (Unknown Organization)
Mass Comment Campaign (927) (Sierra Club-1)
Mass Comment Campaign (99) (Environment Texas)
Mass Comment Campaign (Multiple Submitters) (Unknown Organization)
Mazda North American Operations
Mehrotra, Rahul
Mercedes-Benz USA, LLC
Michigan House of Representatives, 49th District
Michigan State House of Representatives
Michigan State Senate, District 18
Miller, P.
Minnesota Department of Commerce
Mitsubishi Motors R&D of America, Inc. (MRDA)
Moravian College
Motor & Equipment Manufacturers Association (MEMA
National Association of Clean Air Agencies (NACAA)
National Automobile Dealers Association (NADA)
National Caucus of Environmental Legislators
National Propane Gas Association (NPGA)
National Wildlife Federation (NWF)
Natural Resources Defense Council (NRDC)
New Jersey Senate, Third Legislative District
New York City Council, 35th District
New York State Assembly Committee on Government Operations
New York State Senate, 26th District
Nissan North America, Inc.
Northeast States for Coordinated Air Use Management (NESCAUM)
Oblong Land Conservancy
Pennsylvania Department of Environmental Protection
Pennsylvania State Senate et al.
Pew Charitable Trusts
Porsche Cars North America, Inc. (PCNA)
Renewable Energy Long Island
Renewable Fuels Association (RFA)
Ross, D.
Salinas, A.
Securing America's Future Energy (SAFE)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Society of the Plastics Industry, Inc. (SPI)
South Coast AQMD
State of New York The Assembly
Tarazevich, Yegor
Tesla Motors, Inc.

The Catskill Center for Conservation and Development
Toyota Motor North America
U.S. Coalition for Advanced Diesel Cars
Union of Concerned Scientists (UCS)
United Automobile Workers (UAW)
United States Senate
United States Steel Corporation
United Steel Workers (USW)
Volkswagen Group of America
Volvo Car Corporation (VCC)
Weiner, L.
WESPAC Foundation
Whitefoot, K. and Skerlos, S.

Organization: Alexandria Hyundai

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 63.]

Along with my Hyundai colleague, I appreciate the effort on the part of all agencies in developing feasible and harmonized national greenhouse gas and CAFE standards.

Organization: Alliance of Automobile Manufacturers

Two years ago the Alliance testified and commented in support of the model year (MY) 2012-16 greenhouse gas (GHG) and corporate average fuel economy (CAFE) rule and encouraged EPA, NHTSA and the California Air Resources Board (CARB) to continue the single National Program beyond MY 2016. We continue to support having a single National Program and appreciate the agencies' efforts to pursue this goal. [EPA-HQ-OAR-2010-0799-9487-A1, p.3]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 95.]

Organization: Aluminum Association's Aluminum Transportation Group

We congratulate EPA and NHTSA on the outstanding body of work reflected in the NPRM. [NHTSA-2010-0131-0226-A1, p. 1]

In sum, we want to thank the agencies for their continued emphasis on reducing fuel consumption and GHG emissions and commitment to size-based standards. [NHTSA-2010-0131-0226-A1, p. 4]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 219-220.]

We recognize that developing a comprehensive national fuel economy regulation is a formidable task with profound consequences, and we want to sincerely congratulate the agencies on the outstanding job. We sincerely see it as an outstanding body of work and the conclusions are realistic, attainable and will achieve our national objectives in energy so we think it's an outstanding job and a credit to all of the agencies and individuals who are involved. It's been a pleasure to work with the organizations.

Organization: American Chemistry Council (ACC)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 264-265.]

We do want to state on the record that we support the CAFE standards moving forward. We think that they are aggressive but achievable.

The American Chemistry Council's plastics division would like commend both EPA and NHTSA on its approach and on this proposal. We believe the proposal takes a huge step forward in increasing fuel efficiency requirements in automobiles.

Organization: American Council for an Energy-Efficient Economy (ACEEE)

The American Council for an Energy-Efficient Economy (ACEEE) supports the light-duty fuel economy and greenhouse gas rule proposed by NHTSA and the EPA for model years 2017-2025. The proposal represents a very substantial reduction in fuel consumption and greenhouse gas emissions relative to business as usual, as well as enormous saving at the pump for consumers. The economic impacts of the rule will be substantial and net positive. [EPA-HQ-OAR-2010-0799-9528-A2, p.1]

Conclusions

Notwithstanding the multiple recommendations we have made that we believe would strengthen the final rule, we reiterate here our strong support for the proposed standards. We believe that the joint work done by NHTSA and the EPA, along with the California ARB, has resulted in a proposal that is highly significant and sound, from both policy and technical perspectives. We thank the agencies for the opportunity to provide comments and hope that our comments can help to bring about an even better final rule. [EPA-HQ-OAR-2010-0799-9528-A2, p.9]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 108-113.]

On behalf of ACEEE, I'm here to actively support the role of productive investments in more energy-efficient technologies as they might positively improve the robustness of the U.S. economy. In particular, we applaud the U.S. Environmental Protection Agency, the National Highway Traffic Safety Administration, the administration more generally, and the State of California for taking steps that will improve the fuel economy of our nation's light-duty vehicles.

So in sum, the rule, we think, will drive further gains in gasoline vehicles and begin to pull advanced technologies into the market. Cost-effective investments in more fuel-efficient vehicles resulting from this rule should accelerate and optimize benefits, whether jobs, cleaner air and a more robust economy, especially when we take recent consumer interest in fuel economy into account.

Organization: American Honda Motor Co., Inc.

American Honda Motor Co., Inc. (“Honda”) appreciates the efforts made by EPA and NHTSA to create the single national program to address motor vehicle greenhouse gas emissions and fuel economy standards for model years 2017 – 2025. [EPA-HQ-OAR-2010-0799-9489-A1, p. 1]

Honda supports the overarching goal of the NPRM, which is to establish a “coordinated and harmonized approach” to implementing the Clean Air Act’s mandate that EPA regulate motor vehicle emissions, and the mandate in the Energy Policy and Conservation Act (EPCA) that NHTSA regulate motor vehicle fuel economy. [EPA-HQ-OAR-2010-0799-9489-A1, p. 1]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 115-116.]

This NPRM builds upon the important foundation established by the seminal greenhouse gas and CAFE standards adopted for the '12 to '16 model years. These newly proposed standards represent an ambitious, challenging, and dramatic set of goals for most of the automobile industry.

These proposed regulations set forth in the NPRM when harmonized with the proposed regulations now under consideration in California have the potential to simplify and rationalize OEM obligations throughout the United States. Without these harmonized regulations, there is a significant risk that OEMs would face fragmented, conflicting and burdensome regulation of fuel economy and greenhouse gases. There's a strong likelihood that the California regulations, which likely would be adopted by additional states, would diverge from the Federal Regulations resulting in a patchwork of standards that differed in stringency, testing requirements, and flexibilities throughout the country.

Organization: American Lung Association

The American Lung Association is pleased that the U.S. Environmental Protection Agency seeks to reduce these emissions from light-duty vehicles. The joint proposed Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards will reduce carbon dioxide emissions to 163 grams per mile while mandating an average economy of 54.5 miles per gallon in 2025. [EPA-HQ-OAR-2010-0799-9902-A2, p. 1]

While the proposed rule will have significant benefits, there are still areas of critical need. Implementation of the proposed rule will benefit from improved testing and calculation of actual vehicle emissions, reliable air quality impacts assessments of electric vehicles, and averted costs associated with higher projected fuel costs. [EPA-HQ-OAR-2010-0799-9902-A2, p. 2]

The American Lung Association again thanks the U.S. Environmental Protection Agency for consideration of our comments and for the Agency's effort to curb the impacts of air pollution. The American Lung Association urges the Agency to promulgate the proposed rule. The true cost of pollution from mobile sources is paid in compromised human health. As such, the proposed rule will help to reduce those costs. [EPA-HQ-OAR-2010-0799-9902-A2, p. 2]

Organization: American Lung Association of the Mid-Atlantic

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 80-82.]

American Lung Association of the Mid-Atlantic is pleased that the Environmental Protection Agency and the National Highway Traffic Safety Administration have jointly proposed more stringent national standards to reduce greenhouse gas emissions and to increase corporate average fuel economy.

When implemented the new standards will be remarkable achievements.

We support the proposed rule, and we encourage EPA and NHTSA to promulgate a final rule that achieves at least the degree of reduction in air pollutants as a proposal would accomplish.

Organization: American Medical Association of California

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 44-48.]

The American Lung Association in California applauds the collaborative effort put forth by the Obama administration, the State of California, automakers and environmental stakeholders to develop this proposal that we believe will have a lasting impact on improving public health. The American Lung Association in California encourages the administration to pursue strong, clean air programs to improve the health and air of not only Californians, but all Americans.

Increasing fuel economy standards to 54.5 miles per gallon in 2025 and tightening emissions standards to halve greenhouse gas emissions by 2025 compared to today has the potential to transform our nation's vehicles into a cleaner, more efficient fleet that will reduce our addiction to oil, save consumers at the pump, provide expanded choices in cleaner vehicle technologies, and at the same time, cut harmful emissions that endanger the public's health.

The new greenhouse gas and fuel economy standards are an important milestone in the fight against climate change, air pollution and the serious public health impacts of our petroleum dependency and consumption.

Therefore, we urge you to implement strong rules that will withstand any attempts to undermine these goals.

Organization: American Suzuki Motor Corporation

Suzuki Motor Corporation ('Suzuki') supports the concept of a harmonized national approach to reducing greenhouse gas (GHG) emissions and improving fuel economy. [EPA-HQ-OAR-2010-0799-9523-A1, p.1]

Organization: Applied Materials

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 198-201.]

But we are very supportive of the proposal that's being reviewed today; the NHTSA and EPA proposal, and we applaud the Obama Administration for proposing these historic fuel economy and greenhouse gas emission standards.

We believe that sound public policy can be a critical accelerator for industrial development, and we think that's embodied in this current proposal.

No. 1, we do believe that sound science-based standards can drive innovation.

We think that the standards as proposed are achievable.

Lastly, again, in terms of industrial development, we're very supportive of the mile per gallon standard and we believe it's important that there be a domestic industry in this sector as well. And we think that while this is going to be a global effort, it's going to lead to our domestic industry being stimulated as well.

Organization: Association of Global Automakers, Inc. (Global Automakers)

This notice of proposed rulemaking brings us another step closer to the goal of having a long term harmonized national program. Global Automakers and its members have always endorsed a comprehensive and harmonized national approach to reducing GHG emissions and improving fuel economy. [EPA-HQ-OAR-2010-0799-9466-A1, letter p. 1]

We have been working diligently with the agencies, including the California Air Resources Board, to create a harmonized program that meets our national environmental and energy objectives while providing manufacturers the needed flexibility and lead-time to design and build a full range of advanced technology vehicles that consumers want to buy. [EPA-HQ-OAR-2010-0799-9466-A1, letter p. 1]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 65.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 49-50.]

Global Automakers and its members have always endorsed a comprehensive and harmonized national approach to reducing GHG emissions and improving fuel economy. The alternative of having to comply with a patchwork of state requirements would add significant costs resulting in higher vehicle prices, with no corresponding environmental or energy security benefits. We have been working with the Environmental Protection Agency (EPA), Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA), and California Air Resources Board (ARB) to create a program that meets national environmental and energy objectives while providing manufacturers the flexibility and lead-time necessary to design and build advanced technology vehicles that will provide consumers a full range of vehicle choices. This notice of proposed rulemaking (NPRM) brings us another step closer to the goal of having a long term, single national program. [EPA-HQ-OAR-2010-0799-9466-A1, p. 1]

Organization: Aston Martin Lagonda Limited, Lotus Cars Limited and McLaren Automotive

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 117-118.]

We all fully support the EPA and NHTSA proposal.

Organization: Biery-Hamilton, Dr. G.

I strongly support the proposed new fuel efficiency and greenhouse gas standards for cars and trucks to require cars and trucks to an average 54.5 miles per gallon by model year 2025. [EPA-HQ-OAR-2010-0799-9033-A1,p.1]

Together with the 'Phase One' model year 2012-2016 rule finalized in 2010, these tough new standards would more than double America's average fuel economy and are expected to:

-- Save families an estimated $8,200 in fuel savings over the lifetime of a new vehicle by 2025, for a total of $1.7 trillion in national fuel savings over the life of the program.

-- Reduce oil consumption by an estimated 2.2 million barrels a day by 2025 more than our daily 2010 oil imports from the entire Persian Gulf.

-- Reduce carbon dioxide pollution by over 6 billion metric tons over the life of the program equivalent to the emissions from the United States in 2010. [EPA-HQ-OAR-2010-0799-9033-A1, p.1]

Generating less pollution, putting more money in consumers' wallets, easing our addiction to oil, modernizing America's fleet of cars and trucks what's not to like? [EPA-HQ-OAR-2010-0799-9033-A1, p.1]

I am thrilled that this dramatic and bold proposal has earned the support of automakers, autoworkers, national security groups, environmental groups, and many other key stakeholders. And I am proud to add my support to this important rule. [EPA-HQ-OAR-2010-0799-9033-A1, p.1]

I have a small child. Do you have children or grandchildren? If you love them and want them to have a good future, you will support ANY measure to reduce the use of fossil fuels, and the resulting CO_2 emissions. Furthermore, you will support policies to change our industrial farming to reduce methane emissions, also, which change the atmosphere around the planet. [EPA-HQ-OAR-2010-0799-9033-A1, p.1]

Organization: BlueGreen Alliance

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 58-60.]

The BlueGreen Alliance strongly supports the light-duty vehicle standards for model year 2017 to 2025 that will raise fuel efficiency to 54.5 miles per gallon, nearly double what today's fuel efficiency standard is and limit the greenhouses gas emissions as it's been noted to 163 grams per mile.

We also request continuing federal programs to support these auto industry efforts in retooling to meet the demand for cleaner, more efficient cars.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 60-61.]

This is a unique opportunity to fulfill your commitments to create American jobs, protect consumers whether they drive a car or truck from high gas prices and to cut America's dependence on foreign oil. Our 15 BlueGreen Alliance partners and their 15 million members are committed to promoting the fact that green auto jobs are a win-win for all Americans, and we're committed to raise awareness among consumers of the significance of these fuel-saving technologies.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 37-40.]

We strongly support the proposed vehicle standards, which are a great example of how we can achieve simultaneous progress on our economic and environmental challenges. The proposed standard offers the opportunity to create quality manufacturing jobs, to reduce our reliance on imported energy, to reduce our vulnerability to crude oil price volatility, to lean the air and reduce the accumulation of heat-trapping gases in the atmosphere, and to improve our energy security and national security.

While job creation is a paramount concern, we should not discount the other benefits that the proposal will consider. If we are ever to make meaningful progress on our imported energy dependency and avoid accelerated climate destabilization, we will need well-conceived policies such as these.

Organization: BMW of North America, LLC

BMW is committed to working constructively with both EPA and NHTSA to continue a Single National Program for MYs 2017 through 2025 that also realizes the aggressive greenhouse gas reductions sought by the State of California in this timeframe. [EPA-HQ-OAR-2010-0799-9579-A1, p. 1]

The continuation of Single National Program is critical to BMW's ability to plan, design, and build the most efficient vehicles for all of America. [EPA-HQ-OAR-2010-0799-9579-A1, p. 1]

BMW is committed to delivering sustainable products and supports such standards because we think it is the right step in order to successfully address the global environmental challenge facing all nations. [EPA-HQ-OAR-2010-0799-9579-A1, p. 2]

In keeping with our corporate commitment to reduce vehicle greenhouse gas (GHG) emissions, BMW commends both EPA and NHTSA for their efforts to continue to refine the program established for MYs 2012 through 2016 that permits automakers to build a single light duty national fleet, satisfying the requirements of each Agency program as well as those of the State of California. We also greatly appreciate the efforts of the State of California to ensure this outcome. A Single National Program is critical for us so we can plan, design, and build the most efficient vehicles for all of America. [EPA-HQ-OAR-2010-0799-9579-A1, p. 2]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 78.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 78-79.]

We commend both the EPA and the NHTSA for the efforts to continue to refine the program that was previously established for model years 2012 to 2016.

And that program permits auto makers to build a single light-duty national fleet supplying the requirements of each agency program as well as those of the State of California.

Achievable greenhouse gas emission reductions and commensurate fuel economy increases depends on both designing more fuel-efficient vehicles and increasing market demand for such vehicles. We can build the vehicles, but consumers must buy them.

A comprehensive emission reduction policy needs to consider all aspects, most importantly consumer demand.

In conclusion, the BMW Group is committed to working constructively with EPA and NHTSA to continue a single national program for model years 2017 to 2025.

We very much appreciate the efforts of the State of California to ensure the continuation of a single national program going forward.

Organization: Borg Warner, Inc.

BorgWarner would first like to commend the EPA and NHTSA for their combined efforts to continue to harmonize these footprint-based standards and give the automotive industry some much needed long term clarity. [EPA-HQ-OAR-2010-0799-9320-A1, p. 1]

As a global technology leader focused on improving fuel economy and reducing emissions, BorgWarner has experienced what can be achieved in other parts of the world and we are eager to help the U.S. market reach the new standards. [EPA-HQ-OAR-2010-0799-9320-A1, p. 1]

In closing, BorgWarner is supportive of the EPA's and NHTSA's efforts and sees the proposal as a major step forward in our desire for energy independence and reduced CO_2 emissions. We urge the EPA and NHTSA to revisit the proposed rulemaking to ensure it is purely performance based, technology neutral and uses accurate measurement and calculation methods. The marketplace will see the real world results, making the auto industry more stable, globally competitive and a larger contributor to achieving our nation's goals. [EPA-HQ-OAR-2010-0799-9320-A1, p. 2]

Organization: Business for Innovative Climate & Energy Policy (BICEP)

As major U.S. businesses representing nearly 500,000 American jobs and over $100 billion in annual revenue, we are writing to voice our strong support for the proposed Greenhouse Gas (GHG) Emissions and Corporate Average Fuel Economy (CAFE) Standards. These standards represent a critical opportunity to strengthen our economy by creating jobs, benefiting the U.S. auto industry, saving consumers and businesses money on fuel, and reducing greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-9450-A1, p. 1]

As successful American businesses, we know the importance of recognizing and seizing opportunities. This rulemaking is a rare opportunity to strengthen our economy, save consumers and businesses money, create jobs, and mitigate climate risk. We urge the adoption of the strongest possible fuel economy and GHG standards. [EPA-HQ-OAR-2010-0799-9450-A1, p. 2]

Organization: California Air Resources Board (CARB)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket number EPA-HQ-OAR-2010-0799-11787, pp. 11-12.]

As you know, the results of our efforts reveal the enormous benefits of the proposed greenhouse gas standards. Greenhouse gas emissions of 2025 models will be a third lower than those of 2016. Fuel savings will be so substantial that the total cost of owning and operating a low greenhouse gas vehicle will be less than it is today, despite the higher initial cost of the vehicle. And the fuel savings means money that would have gone overseas to produce petroleum will stay in our country where it will be spent and create new jobs for Americans. This is truly a win-win proposal that will benefit America.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 12-13]

As part of our effort to ensure a national program, CARB has committed to accept compliance with the EPA greenhouse gas standards as compliance with our state standards. Once this occurs, hopefully by this summer, CARB will hold another hearing to consider a regulatory provision to formalize our commitment allowing compliance with EPA standards to fully satisfy the states' regulation. This is the same process and sequence of events we followed to allow EPA's compliance with 2012 to 2016 greenhouse gas standards to satisfy CARB standards for those years. Our intent is clear from our proposal and it will be memorialized in a formal resolution that would go before our board later this week.

Organization: Capozzelli, J.

The proposed fuel-efficiency and greenhouse gas standards for passenger vehicles and light trucks are a good step in reducing dangerous global warming, increasing national security and improving our economy. Compared to business as usual, they will prevent millions of tons of global warming emissions, save consumers billions of dollars at the gas pump and reduce America's dependence on dirty fossil fuels. [NHTSA-2010-0131-0221-A1, p.1]

We can no longer afford to pass up this tremendous opportunity. Setting fuel efficiency standards, because curbing global warming pollution from our transportation sector is one of the easiest and most effective ways to slow the quickening pace of climate change. [NHTSA-2010-0131-0221-A1, p.1]

Please adopt the strongest possible standards and close the SUV loophole. We must reduce carbon pollution from our cars, not increase it.

Organization: Center for Biological Diversity

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 214-216.]

We really appreciate the effort of the EPA in the sense that it should be ruled, and it's a laudable effort.

Organization: CEO Pipe Organs/Golden Ponds Farm

I support the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, which will allow cars and light trucks to drive farther on a gallon of gas and reduce USA dependence on imported oil. The price of gas is once again squeezing the budgets of USA families, who already are forced to cut back in other areas just to pay for basic transportation needs. [EPA-HQ-OAR-2010-0799-9229-A1, p.1]

This spring, you set a goal of reducing oil imports by one-third this decade, and in November you proposed fuel efficiency standards that will effectively double current requirements. I commend your efforts. I believe it is important to increase USA investment in fuel efficient technologies, save consumers money at the pump, help this country break its dependence on foreign oil, and protect the global environment. [EPA-HQ-OAR-2010-0799-9229-A1, p.1]

Do not let these standards be watered down. Protect and finalize the new fuel efficiency rules. [EPA-HQ-OAR-2010-0799-9229-A1, p.1]

Organization: Ceres

As a national coalition of investors, environmental organizations and other public interest groups working with companies to address sustainability challenges such as global climate change, we are writing to voice our strong support for the proposed Greenhouse Gas (GHG) Emissions and Corporate Average Fuel Economy (CAFE) Standards. [EPA-HQ-OAR-2010-0799-9475-A1, p. 1]

In sum, independent, credible analysis shows that the proposed standards will both benefit the auto industry, especially the Detroit 3, and create jobs. In addition, the proposed standards will spur innovation, reduce both our dependence on oil and climate risk, and save businesses and consumers money. Accordingly, we urge the adoption of the strongest standards possible. [EPA-HQ-OAR-2010-0799-9475-A1, p. 2]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 74-76.]

Organization: Chrysler Group LLC

Chrysler strongly supports a single, harmonized national greenhouse gas and fuel economy performance standard ("National Program") that allows manufacturers to build "a single fleet of U.S. vehicles that [will] satisfy all requirements under both programs as well as under California's [greenhouse gas] program, helping to reduce costs and regulatory complexity while providing significant energy and environmental benefits." In its letter of support for the proposed 2017-2025 model year ("MY") National Program, Chrysler committed to the proposed standards as substantially described in the agencies' August 2011 Supplemental Notice of Intent. [EPA-HQ-OAR-2010-0799-9495-A1, p. 1]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 52-53.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 25.]

This rulemaking builds upon the landmark Federal greenhouse gas and CAFE program for model year ("MY") 2012-2016 light-duty vehicles, referred to as the "National Program". Chrysler has long supported both the original National Program and this extension to it. [EPA-HQ-OAR-2010-0799-9495-A1, p. 5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 51.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 57-60.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 24-25.]

Chrysler recognizes the benefit for the country of continuing the national program to address fuel economy and greenhouse gases. EPA and NHTSA began this program in 2009 with standards for model years 2012 through '16, and now the agencies are continuing for model years 2017 through '25.

Chrysler supports the goals of the program.

The foundation principles are: (1) strong performance requirements, (2) a midterm review to assess customer acceptance, and (3) a broad use of incentives to encourage technology innovations and early integration into production vehicles.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 52-53.]

However, Chrysler fully supports the goals of this program. Sergio Marchionne, our CEO is also the CEO of Fiat, which is the industry's fuel economy leader in Europe. He understands and endorses these commitments and is determined to pursue the product actions necessary for Chrysler to meet these 2017 and beyond goals.

Chrysler will support the final rules if they reflect the commitments and the foundational principles of the framework agreement. These foundational principles are one, strong performance requirements; two, a mid-term review to assess customer acceptance; and, three, the broad use of incentives to encourage technology innovations and early integration into production vehicles.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 55.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 62.]

In conclusion, I reiterate Chrysler's support for a single harmonized national standard for fuel economy and greenhouse gas emissions.

Organization: Climate Institute

I am writing in support of the strong fuel-efficiency and carbon pollution standards for new cars and trucks. Having been the scientist whose brief Justice Stevens cited in his majority opinion in Massachusetts et al. v. EPA to justify granting standing, I would reiterate that the damages occurring now and projected in the future as a result of greenhouse gas emissions are significant and the risk of much more severe conditions ahead is very great. [EPA-HQ-OAR-2010-0799-7944-A1, p. 1]

As my brief also made clear, the transport sector is a key contributor to CO_2 emissions and they must be reduced. Greatly increasing the mileage standards is a critical step and I urge you to move forward. [EPA-HQ-OAR-2010-0799-7944-A1, p.1]

Organization: Consumer Federation of America (CFA)

A LANDMARK POLICY SUPPORTED BY AN UNPRECEDENTED CONSENSUS

Seven Presidents have declared the goal of reducing U.S. dependence on oil, but little progress has been made. Statements at the public hearings held by the National Highway Traffic Safety Administration (NHTSA) and the Environmental Protection Agency (EPA) on the recently proposed auto standards for 2017-2025 indicate a remarkable shift in the policy landscape with the emergence of an unprecedented consensus in support of fuel economy standards that would double the efficiency of cars and trucks in less than two decades and dramatically reduce oil consumption and imports. [EPA-HQ-OAR-2010-0799-9419-A1, p. 1]

Public witnesses say and consumer advocates present survey and behavioral evidence that consumers want and will pay for more fuel efficient vehicles.

Automakers and auto workers say they can and will manufacture those vehicles.

National security experts and environmentalists say the nation will benefit from the standards.

The only stakeholder that does not seem “to get” it is the National Automotive Dealers Association. [EPA-HQ-OAR-2010-0799-9419-A1, p. 1]

Over the course of a decade, the growing public concern about gasoline and its burden on household budgets drove a policy consensus in support of higher standards. This consensus includes not only almost all of the stakeholders in the industry, but it also crosses the federal and state levels, all branches of government, and both political parties. [EPA-HQ-OAR-2010-0799-9419-A1, p. 1]

These comments and the attached Technical Appendices explain why the standards have earned such widespread support and why the concerns of the dealers, genuine though they may be, are unfounded. We present over a dozen reasons that the standards will benefits consumers, the economy, national security, and the environment. [EPA-HQ-OAR-2010-0799-9419-A1, p. 1]

The future of the auto industry lies in developing and delivering more fuel efficient vehicles. The future of the American economy lies in using energy much more efficiently. The proposed standards will help to ensure that the U.S. auto industry and the U.S. economy successfully negotiate the transition. These comments show that because these fuel economy standards are the most important energy policy in a quarter of century, they deserve the remarkable national consensus support they have received. [EPA-HQ-OAR-2010-0799-9419-A1, p. 1]

CONSUMER GROUP COMMENTERS AND APPROACH

The Consumer Federation of America (CFA) and 23 of its member groups appreciate the opportunity to submit comments on the proposed standards for cars and light duty trucks. As summarized in Exhibit S-1, we have been actively involved in this important area of energy policymaking at both the federal and state levels. Over the past seven years, CFA has issued dozens of reports on the technology, auto market behavior and consumer economics of auto fuel economy, as well as conducted numerous surveys on consumer attitudes about gasoline consumption and fuel economy standards. [See Exhibit S-1 on p. 2 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, p. 1]

CFA has analyzed the economics of fuel economy and monitors the development of fuel economy standards in an effort to ensure that policymakers set a standard that is good for consumers and the nation. These comments build on that background and incorporate several of the early analyses as technical appendices. The comments launch from and focus on the key factors that impact the consumer, but also reflect the factors that affect the industry and the conditions that Congress has required the agencies to take into account in the rulemaking. The following list summarizes the analyses we have conducted to reach the conclusion that the proposed standards will benefit consumers. The Roman numerals identify the section in the technical appendix in which data is presented addressing each issue. [EPA-HQ-OAR-2010-0799-9419-A1, p. 1]

I. CONSUMER REALITY: CONSUMERS NEED MORE FUEL EFFICIENT VEHICLES

Over the past decade, gasoline prices have gyrated wildly around a strong upward trend. Exhibit S-2 shows the average annual expenditure on vehicle ownership (new and used vehicles) compared to the expenditure on gasoline, as reported in Bureau of Labor Statistics' annual Consumer Expenditure Survey. [See Exhibit S-2 on p. 3 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, p. 3]

Gasoline prices set a record high in 2011 averaging $3.53 per gallon. The average price for January 2012 was the highest on record for the month of January. [EPA-HQ-OAR-2010-0799-9419-A1, p. 3]

Household gasoline expenditures set a record last year, reaching an average of over $2,850 per year. [EPA-HQ-OAR-2010-0799-9419-A1, p. 3]

Rising gasoline prices have changed the structure of the cost of driving. Ten years ago, the average cost of owning a vehicle was the largest single component of the cost of driving. Today, the average cost of owning a vehicle has come down approximately 20% and the cost of gasoline has tripled. [EPA-HQ-OAR-2010-0799-9419-A1, p. 3]

In 2011, the cost of gasoline will equal or exceed the cost of owning the vehicle for the first time. [EPA-HQ-OAR-2010-0799-9419-A1, p. 3]

In 2011, gasoline expenditures were 40 percent higher than expenditures on home energy (electricity, natural gas and heating oil); ten years ago, they were 13% lower. [EPA-HQ-OAR-2010-0799-9419-A1, p. 3]

II. CONSUMERS ATTITUDES: CONSUMERS WANT MORE FUEL EFFICIENT VEHICLES AND SUPPORT FUEL ECONOMY STANDARDS.

Given the burden on household budgets and the continuing problem of oil vulnerability, it is not surprising to find that 75 percent or more of respondents to our public opinion polls: [EPA-HQ-OAR-2010-0799-9419-A1, p. 4]

- are concerned about gasoline prices and dependence on Mid-East oil;
- think it is important to reduce oil consumption; and,
- support higher fuel economy standards as a good way to do so.
- In fact, almost two-thirds of the respondents support a 60 mile per gallon standard with a payback period of 3-5 years and think it will be good for automakers. [EPA-HQ-OAR-2010-0799-9419-A1, p. 4]

Exhibit S-3 shows widespread support for fuel economy standards that are even higher than those proposed by NHTSA-EPA in a national random sample poll of over 2000 respondents. Substantial majorities support standards across different types of states and the political spectrum, even with payback periods of ten years. [See Exhibit S-3 on p. 4 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, p. 4]

III. CONSUMER BEHAVIOR: CONSUMERS HAVE SHOWN THEY ARE WILLING TO PAY FOR MORE FUEL EFFICIENT VEHICLES

Consumers don’t just say they want more fuel efficient vehicles--they have shown they are willing to buy them. Looking at the total light duty markets (cars and light trucks) between 2004, the year when the worst price increases began, and 2011, the market shares of:] [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

- cars increased from 48% to 59% of all vehicles,
- 4-cylinder engines increased from 28% to 48%,
- the use of variable transmissions and the number of gears has increase dramatically, and
- sales of small and mid-sized SUVs increased by more than one-third to almost 21% of all vehicles sold, while large SUVs dropped by 70% to less than 2% of vehicles sold.

Looking at cars only, [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

- hybrids increased from less than 1% of cars sold to more than 6%, but
- small cars remained constant at 47% of all cars sold. [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

THE EMERGENCE OF A NATIONAL POLICY CONSENSUS

The reality of soaring consumer expenditures on gasoline and the response by consumers in the marketplace provides the context for the dramatic shift in public policy and the growth of a political consensus over the first decade of the 21st century. Although the gasoline price spike of 2000-2001 proved to be a blip, compared to later developments, it got the attention of the public and policy makers. [EPA-HQ-OAR-2010-0799-9419-A1, p. 14]

At least since the National Academy of Sciences concluded in 2002 that technologies exist to dramatically increase fuel economy at manageable costs, the public policy debate has been about how far and how fast the fuel economy of the vehicle fleet can be raised. In the early 2000s, California exercised its authority under the Clean Air Act to propose new standards to cut emissions from automobiles, which have the effect of also increasing fuel economy. When 13 states and the District of Columbia adopted the Clean Cars Program, they created a market that ranks in the top five in the world and gave a big push to raising standards.1 The automakers could not ignore such a market. [EPA-HQ-OAR-2010-0799-9419-A1, p. 15]

The much more dramatic price spikes of the middle of the decade moved concerns about gasoline consumption to center stage, so much so that President Bush made a dramatic statement about it in his 2006 State of the Union Address by declaring “here we have a serious problem: America is addicted to oil, which is often imported from unstable parts of the world. The best way to break this addiction is through technology.”2 Democrat and Republican legislators, federal and state policy makers as well as all three branches came together to support a significant increase in fuel economy standards. [EPA-HQ-OAR-2010-0799-9419-A1, p. 15]

In response, Congress, with Republican majorities in both houses, enacted the Energy Independence and Security Act of 2007 (EISA). The law, which both the Bush administration and the Obama administration moved quickly to implement, reformed and improved the approach to standards and restarted the process of setting standards, after almost three decades in which the fuel economy standards program had been essentially dormant. [EPA-HQ-OAR-2010-0799-9419-A1, p. 15]

Congressional action significantly improved the approach to standard setting in several ways. For example, by requiring NHTSA to set an attribute-based standard, the incentive to downsize the fleet is reduced. Authorizing several forms of flexibility promotes efficiency in meeting the standard. Incentives encourage development of new technologies. The momentum for higher standards was reinforced by the courts and legal action. A Supreme Court decision upholding the authority of the U. S. Environmental Protection Agency (EPA) to regulate greenhouse gasses as a pollutant strengthened federal authority. The federal government supported the Clean Cars program and the courts upheld state authority. [EPA-HQ-OAR-2010-0799-9419-A1, p. 15]

The Obama Administration has used Executive Branch authority to improve the overall process. The White House issued an executive order that required EPA and NHTSA to coordinate with each other and the California Air Resources Board--coordination that immediately led to increases in the standard that will save consumers over $35 billion in the 2012-2015 period alone. The ongoing effort to set a long-term standard responds to the oft repeated observation that the auto industry needs time to adapt. [EPA-HQ-OAR-2010-0799-9419-A1, p. 15]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 42.]

The simple fact of the matter is that with every scenario considered by the two agencies the benefits vastly exceed the costs, and everyone gets that. That's why you heard labor, you have heard the environmentalist, you've heard automakers and you've heard consumers support this program.

Simply put, these standards may well be the most important energy policy of the last quarter of a century. They are a win-win-win for consumers, for the economy, for national security and the environment.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 58.]

The proposed standards will deliver major economic security, air quality benefits to consumers and the nation while putting the U.S. auto industry back on the path to global success.

We are not alone in the support of this standard. Consumers, automakers and autoworkers recognize the important need for achievability of more fuel-efficient vehicles.

It is remarkable that 13 of the 16 major car manufacturers support these standards. Clearly, they know they can manufacture the vehicles that meet the standard, and they understand it's what their consumers want and will pay for.

The only major opponents of this consumer-backed policy are the car dealers. Their opposition shows what I believe to be an incomprehensible reaction to the desires of their customers, the capability of manufacturers that they sell the cars for, and the critically important need to reduce our dependency on foreign oil. So we appreciate the opportunity to respond to our good friends in the auto dealers community.

---

1 The Clean Cars states (Arizona, Connecticut, Washington D.C., Florida, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont, and Washington). account for 40% of U.S. registered vehicles (Bureau of the Census, STATISTICAL ABSTRACT OF THE UNITED STATES http://www.census.gov/compendia/statab/2006/transportation/motor_vehicle_registrations/) making the market larger than all markets except the rest of the U.S., the European Union and Japan,

2 'Here we have a serious problem: America is addicted to oil, which is often imported from unstable parts of the world. The best way to break this addiction is through technology,' he said,

adding that technological advances will help achieve a 'great goal: to replace more than 75 percent of our oil imports from the Middle East by 2025.” http://articles.cnn.com/2006-01-31/politics/sotu.energy_1_oil-prices-oil-imports-big-oil?_s=PM:POLITICS

Organization: Consumer Reports

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 168-169.]

In summary, we support the proposed fuel economy standards because in addition to achieving national security and environmental goals, they will save consumers thousands of dollars, and improve the selection of fuel efficient and alternative fuel vehicles and maintain the range of wide vehicle options.

Organization: Consumers Union

Introduction

Consumers Union supports the proposed Corporate Average Fuel Economy (CAFE) standards and recommends that the National Highway Traffic Safety Administration (NHTSA) and the Environmental Protection Agency (EPA) move forward to update the program for 2017-2025 to build upon the progress made in the last CAFE rulemaking for model years 2012-2016. While we believe a higher CAFE target, particularly for light trucks, would drive even greater fuel savings and technological advancement, the proposed target is reasonable and provides excellent value for consumers. [EPA-HQ-OAR-2010-0799-9454-A2, p.1]

Comments

I. Consumers benefit from the proposed standards

Improving fuel economy standards serves important national security, economic, and environmental goals and provides outstanding consumer benefits. Requiring better fuel efficiency from every auto manufacturers’ fleet will drive innovation, provide more certainty for investment in cleaner and more efficient technologies, and help erode the price premium often charged for superior fuel economy. Right now, many automakers charge more for more fuel efficient versions of certain vehicles,[2] and hybrid power trains often run thousands of dollars more expensive than their traditional counterparts. Improving fuel economy standards will spur greater investment and deployment of more efficient gasoline engines and create incentive for improvements in battery technology that will lower costs and improve performance of electric and hybrid-electric power trains. [EPA-HQ-OAR-2010-0799-9454-A2, pp.1-2]

In conclusion, Consumers Union commends NHTSA and EPA for developing robust, forward-looking CAFE standards that should yield substantial consumer benefits and encourages the agencies to head off and monitor any compliance strategies that undermine the projected benefits. A more efficient fleet will save consumers thousands of dollars in fuel costs, improve selection of fuel efficient and alternative fuel vehicles, and maintain a range of options across vehicle class. Thank you for considering our views. [EPA-HQ-OAR-2010-0799-9454-A2, pp.7-8]

---

2 - Examples include the Ford Fiesta SFE, Ford Focus SFE and Honda Civic HF.

Organization: Delphi Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 108-112.]

We support the continuation of a national program that incorporates energy efficiency and emission reduction benefits, while remaining technology neutral without favoring selective approaches.

Again, we feel a national program that incorporates energy efficiency and emission reduction benefits should remain technology neutral. I think you can see that Delphi has taken this approach in order to provide its customers the broadest range of technologies to meet their individual requirements.

Organization: Detroit NAACP

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 139.]

We applaud the EPA, NHTSA as well as DOT as well as California and the Obama Administration for taking another large step along a long road to sustainable transportation systems.

Organization: E100 Ethanol Group

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 202.]

The E100 Ethanol Group fully supports the objectives of this program as evidenced by the White House graphic released last July.

Organization: Eaton Corporation

Our comments are meant to strike a balance between GHG reduction goals and the economic realities of the U.S. automotive and transportation industries, taking into account the diverse goals of all stakeholders ranging from original equipment manufacturers (OEM), automotive technology suppliers, dealers and environmental advocates. We believe that the framework outlined in the NPRM is a good step toward a final regulation that will drive innovation and foster both technology and competition, while maintaining fleet diversity and incentivizing over-achievement of emissions and fuel economy targets. [EPA-HQ-OAR-2010-0799-9494-A1, p. 2]

We hope that our comments contribute to the current framework outlined in the NPRM and lead to a final regulation that will drive innovation and foster both technology and competition, while maintaining vehicle performance, safety and affordability. [EPA-HQ-OAR-2010-0799-9494-A1, p. 3]

Organization: Ecology Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 191.]

Beyond the direct benefits of the standard, the Ecology Center would like to commend the EPA and NHTSA on its successful negotiation that is reflected in the standards we are discussing here today. It is no small feat to be able to bring together such a broad representation of interests including the automotive, environmental and consumer groups as well as the State of California to negotiate a rule that all parties can support. We believe it is important to recognize the successful process that the agencies have managed and led, including the cooperation between the two agencies itself.

Organization: EcoMotors International, Inc.

EcoMotors supports continuation of a coordinated National Program to reduce GHG emissions and improve fuel economy, and generally supports the manner in which the agencies have proposed to harmonize their regulations. [EPA-HQ-OAR-2010-0799-9594-A2, p. 1]

Organization: Edmunds.com

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 100.]

I'd like to first note that the Edmunds.com agrees with the motivation behind the proposed CAFE standards; that is, we agree it is necessary for the government to intervene in the market in order to significantly reduce vehicle emissions and increase reliance on foreign oil.

Organization: Electric Drive Transportation Association

EDTA supports many aspects of this proposal, including the zero-emissions compliance value and the inclusion of a multiplier for electric drive vehicles. These incentives will enable manufacturers to accelerate the development and deployment of electric drive technologies, which will give consumers a wide array of vehicle choices, while also helping to reduce emissions and reduce our dependence on petroleum fuels. [EPA-HQ-OAR-2010-0799-9449-A1, p. 1]

We urge EPA and NHTSA to finalize a rule that retains strong incentives for electric drive vehicles, while also addressing the specific concerns raised in these comments. [EPA-HQ-OAR-2010-0799-9449-A1, p. 7]

Organization: Environmental Defense Fund (EDF)

We applaud the collaboration between EPA, NHTSA, auto companies, the workers that forge cleaner cars and the state of California in building this proposal, together, through tough negotiations and an abiding commitment to a common good for our nation. The success of this collaboration is reflected in the broad support for this rule from small businesses, consumers, veterans, national security experts, and many more across our land. [EPA-HQ-OAR-2010-0799-9519-A1, p.2]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 171.]

In 2010, NHTSA and EPA together finalized the first-ever joint greenhouse gas and fuel economy standards for light-duty vehicles – a laudable achievement. The Agencies estimate that the standards for MY2012-2016 cars and light trucks will save consumers more than $3000 over the lifetime of a 2016 vehicle. The rule is also expected to reduce GHG emissions from the light-duty fleet by approximately 21 percent by 2030 and save 1.8 billion barrels of oil over the lifetime of the fleet.12 [EPA-HQ-OAR-2010-0799-9519-A1, p.3]

Following this first phase of fuel economy and GHG standards, in a May 2010 Presidential Memorandum, President Obama requested that EPA and NHTSA continue a coordinated National Program to improve fuel efficiency and reduce greenhouse gas emissions of light-duty vehicles for MY2017–2025. The President stated that the second phase should “seek to achieve substantial annual progress in reducing transportation sector greenhouse gas emissions and fossil fuel consumption” and “strengthen the industry and enhance job creation in the United States.”13 In this proposal the agencies estimate the second phase of the National Program will save approximately 4 billion barrels of oil and 2 billion metric tons of GHG emissions over the lifetimes of those vehicles sold in MY 2017-2025. The agencies also estimate that the fuel savings will far outweigh higher vehicle costs, and that the net benefits to society of the proposed standards will be as much as $421 billion over the lifetime of MY 2017-2025 vehicles.14 [EPA-HQ-OAR-2010-0799-9519-A1, p.3]

If finalized, these standards, together with MY 2012-2016 standards, will create a formidable National Program that will greatly reduce our reliance on foreign oil and our contribution to climate altering greenhouse gas emissions, while saving Americans over a trillion dollars. [EPA-HQ-OAR-2010-0799-9519-A1, p.3]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 287.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 172-173.]

The proposed rule under consideration today will help to provide energy security, economic security and climate security for our nation. Increasing the efficiency of our passenger fleet is one of the single most effective solutions we can employ to reduce our dependence on oil, and will likely be President Obama's greatest climate and energy security legacy.

Organization: Ferrari

Ferrari appreciates the efforts made by EPA and NHTSA to work closely together and with CARB in order to develop a proposal for a single coordinated national program (herewith National Program) to regulate greenhouse gases and fuel economy for the period MYs 2017-2025, as it was done for the final rule for MYs 2012-16. This is a prerequisite that allows auto manufacturers to build a single national light-duty fleet that would comply with both the GHG and the CAFE standards, and also with CARB GHG regulation. [EPA-HQ-OAR-2010-0799-9535-A2, p.10]

We deem it is essential to have federal regulations on these important topics, to avoid a patchwork of different State rules. Accordingly, it is necessary that, once the National Program is adopted as final rule, the California will accept the compliance with it and no other State rules on this subject will be enacted in the future years. [EPA-HQ-OAR-2010-0799-9535-A2, p.10]

It is important to define regulations which do not penalize certain types of vehicles, and manufacturers to allow consumers to choose from the same mix of vehicles that are currently in the marketplace. [EPA-HQ-OAR-2010-0799-9535-A2, p.10]

CO_2 emissions and fuel economy are strictly related to each other. Therefore, we appreciate the effort of EPA and NHTSA to harmonize the corresponding regulations to the greatest extent feasible, taking into account the respective statutory obligations. Hopefully such harmonization should be extended to the provisions reserved to small-volume manufacturers and small business entities. [EPA-HQ-OAR-2010-0799-9535-A2, p.14]

Organization: Fisker Automotive, Inc.

Fisker Automotive applauds EPA and NHTSA for their leadership in establishing a National Program that jointly reduces greenhouse gas emissions and improves fuel economy in the light-duty fleet. This is an important step the builds upon the groundbreaking May 7, 2010 rule to establish fleet greenhouse gas emissions and fuel economy standards for model years 2012-2016. [EPA-HQ-OAR-2010-0799-9266-A1, p. 1]

Fisker believes that protecting the environment and the nation’s energy security are important goals that play an increasingly prominent role in car buying decisions. We also believe that car buyers would like to reduce their impact without compromising the performance, luxury, or freedom that they expect from today’s cars. [EPA-HQ-OAR-2010-0799-9266-A1, p. 1]

We remain overall strongly supportive of both agencies’ efforts to reduce emissions and fuel consumption, and urge them to allow our company to fully participate in these efforts as soon as reasonably possible. [EPA-HQ-OAR-2010-0799-9266-A1, p. 5]

Organization: Ford Motor Company

Just over two years ago we provided comments on the regulation that harmonized greenhouse gas emissions and CAFE standards for passenger cars and light duty trucks for model years 2012 through 2016. At that time we encouraged the Agencies to continue to work together to ensure continuation of the harmonized requirements beyond 2016. This proposal seeks to achieve that goal. We applaud the combined efforts of EPA and NHTSA in the development of a joint proposal to extend One National Program. Only a harmonized, nationwide set of GHG and fuel economy standards will enable manufacturers to plan and invest for the future with confidence. [EPA-HQ-OAR-2010-0799-9463-A1, p. 1]

While the new requirements go far beyond the first regulation, both in the timeframe covered as well as the challenges they pose for our industry, we support the national goals for greenhouse gas reduction and energy independence that have driven these aggressive targets. [EPA-HQ-OAR-2010-0799-9463-A1, p. 1]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 42-43.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 30-31.]

We applaud the combined efforts of the EPA and NHTSA, as well as the California Air Resources Board. This proposal provides our industry both the single program moving forward, as well as the regulatory framework that enables manufacturers to plan and invest for the future with confidence.

As a result, we are continually investing in our product strategy to improve the fuel economy and reduce the greenhouse gas emissions of our fleet.

Starting this year, one-third of our vehicle line up will offer a model that achieve at least 40 miles per gallon.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 43.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 30-31.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 10-11.]

The standards proposed are aggressive, but so are the demands from our customers for greater fuel efficiency.

Organization: General Motors Company

General Motors Company recognizes the benefits to the country and to vehicle manufacturers of continuing the National Program to address fuel economy and greenhouse gases that the Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) began in 2009 with the standards for model years 2012 through 2016, and that those agencies are proposing to continue for 2017 and later model years. As indicated in our comments at the January 17, 2012 public hearing in Detroit, General Motors Company supports the proposal and hopes it serves as the basis for a continued National Program. [EPA-HQ-OAR-2010-0799-9465-A1, p. 2]

The agencies' have crafted a proposal that is consistent with the intent of the framework announced by the administration on July 29, 2011. We commend the technical staffs of both agencies for working together on this highly complex issue, and appreciate their efforts to produce a harmonized approach for federal regulation of new vehicle fuel economy and greenhouse gas emissions. We further commend the agencies for the leadership that the federal government has shown in trying to minimize the disruptive impacts of having multiple and different programs at the federal and state levels. [EPA-HQ-OAR-2010-0799-9465-A1, p. 2]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 34-35.]

GM supports the flexibilities in the proposal. They reflect due consideration of the technical data and are appropriately designed to encourage early investment in technologies that will produce both fuel consumption and environmental benefits -- the same technologies that will be necessary to meet the challenging future standards. [EPA-HQ-OAR-2010-0799-9465-A1, p 3]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 38.]

In conclusion, we urge both EPA and NHTSA to continue the strong leadership role they have displayed at the federal level with an integrated approach that addresses infrastructure of vehicles themselves, fuels, and customer behavior as well as all other sectors of the economy. This proposal is a positive first step and a good foundation on which we can all build.

Organization: Growth Energy

Growth Energy and its members salute the efforts by NHTSA and EPA (collectively, "the Agencies") to solicit data, analysis and views on the Joint NPRM, and to respond to the public's comments. [EPA-HQ-OAR-2010-0799-9505-A1, p. 1]

Organization: Guardian Automotive Products, Inc.

Guardian also applauds the harmonization of fuel economy and CO_2 emissions credits. [EPA-HQ-OAR-2010-0799-9299-A1, p. 1]

Organization: Honeywell International, Inc.

Honeywell commends EPA and NHTSA for their hard work and foresight in developing a Proposed Rule that responds to 'our country's critical need to address global climate change and to reduce oil consumption' for the foreseeable future. [EPA-HQ-OAR-2010-0799-9497-A1, p.3]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 206.]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 259.]

Honeywell supports the National Program of increasing fuel economy and reducing greenhouse gas emissions. A harmonized regulatory structure allows OEMs to define product pathways forward toward compliance. This, in turn, allows suppliers to focus research and development in order to provide the most substantial short and long-term benefits.

Organization: Honeywell Transportation Systems

Honeywell appreciates the opportunity to contribute to this rulemaking and remains committed to offering solutions to reduce GHG emissions in the United States in a manner that allows the nation’s automotive industry to thrive. [EPA-HQ-OAR-2010-0799-9474-A1, p.6]

Organization: House of Representatives, Congress of the United States

We write to commend you for bringing certainty to fuel economy and tailpipe emission standards for model years 2017-25 cars and light trucks to 54.5 miles per gallon (mpg). [EPA–HQ–OAR–2010–0799-1221-A1, p. 1]

The framework agreement brought together automotive manufacturers, labor, the environmental community, and government agencies. Industry groups such as the National Association of Manufacturers praised the agreement as a 'positive step.' As a result, automakers will enjoy regulatory certainty, which will help them design and build the advanced technology vehicles of the future and compete in an increasingly global marketplace. The agreement protects American jobs and consumers, and as such was a remarkable achievement. [EPA–HQ–OAR–2010–0799-1221-A1, p. 1]

These regulations, taken together with the first phase of the standards for model years 2012-16 vehicles, will remove the need for as much as 3.8 million barrels of petroleum per day by 2030. Consumers will save thousands of dollars at the pump for gasoline they will no longer need to buy over the lifetime of their vehicles. [EPA–HQ–OAR–2010–0799-1221-A1, p. 1]

In conclusion, we believe that these standards to reduce petroleum use in cars and light trucks represent an opportunity to increase our national and economic security in an unprecedented way by dramatically decreasing our dependence on foreign sources of petroleum. They also bring a certainty to the regulatory framework for the industry and workers who design and build these vehicles. [EPA–HQ–OAR–2010–0799-1221-A1, p. 1]

Organization: Howard, P.

I am writing in support of the strong fuel-efficiency and carbon pollution standards for new cars and trucks. [EPA-HQ-OAR-2010-0799-10063-A1, p. 1]

The benefits of strong standards are overwhelming. By giving automakers a clear direction for improving their new vehicles, EPA and DOT together are ensuring that new vehicles in 2025 will be almost twice as efficient as new vehicles today. I know the automakers can do better and these standards will ensure that automakers innovate and put the best technologies to work to cut dangerous carbon pollution and help America move beyond oil. [EPA-HQ-OAR-2010-0799-10063-A1, p. 1]

I applaud the EPA and DOT for working together to propose these standards that will strengthen fuel efficiency and carbon pollution standards for new passenger cars and trucks to 54.5 mpg by 2025. It matters to me that we take this critical step to curb the dangers of climate disruption, cut our addiction to oil, and keep billions of dollars in our economy instead of spending them on oil. [EPA-HQ-OAR-2010-0799-10063-A1, p. 1]

Organization: Hyundai America Technical Center

The improvement of fuel economy and the control of GHGs are very important to Hyundai. Hyundai has long been an industry fuel efficiency leader and, in 2010, we publicly pledged to reach fleet-wide performance of 50 plus mpg by 2025. In our discussions with the agencies on this rulemaking, we have consistently supported a standard in excess of 50 mpg and we continue to support the agencies on this rulemaking. [EPA-HQ-OAR-2010-0799-9547-A1, p.1]

We appreciate the significant effort on the part of all the agencies in the difficult task of developing feasible and harmonized national greenhouse gas and CAFE standards. We believe that it is the right thing to do for the environment and for the nation's energy security. [EPA-HQ-OAR-2010-0799-9547-A1, p.1]

In summary, Hyundai applauds the agencies' efforts in putting together a national program to reduce GHG emissions and improve fuel economy. [EPA-HQ-OAR-2010-0799-9547-A1, p.8]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 172.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 22.]

We continue to support the agencies in this rulemaking. We believe that it's the right thing to do for the environment and for the nation's energy security.

Organization: ICM Inc.

There are a multitude of reasons for pursuing higher fuel economy fuel standards in light-duty trucks and passenger vehicles ranging from energy security to improved air quality to economic development. We believe the CAFE Rule presents an opportunity to touch all of these objectives, which, of course, begin with the simple notion of reducing our use of imported petroleum. [EPA-HQ-OAR-2010-0799-9541-A2, p.1]

Organization: Insurance Institute for Highway Safety (IIHS)

As we have done in the past, IIHS supports NHTSA's efforts to increase fuel economy while maintaining vehicle safety through the use of a size-based system. [NHTSA-2010-0131-0222-A1, p.1]

Organization: International Council on Clean Transportation (ICCT)

This proposed rule builds upon the impressive improvements in the 2012---16 final rules and takes another large step towards catching up with vehicle efficiency in Europe, Japan, and other nations (Figure 1). We applaud EPA and NHTSA, along with California, the Administration, and the vehicle manufacturers, for taking another step along the road to a sustainable transportation system and enhancing U.S. credibility worldwide. [See Figure 1 on p. 1 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 1]

There are tremendous opportunities to dramatically reduce climate change emissions from passenger vehicles in the near term. Internal combustion engines are over a century old and are widely perceived as nearing the end of their development, but the reality is exactly the opposite. The same is true for materials that make up the vehicle body and parts. Rapid improvements in computer---based tools are opening up technology gains that were never possible before. Computer simulations and computer---aided---design are enabling vastly improved designs and on---board computers allow unprecedented integration of engine, transmission, and hybrid operation. Instead of slowing down, the pace of technology development just keeps accelerating. This is especially true of lightweight material design. [EPA-HQ-OAR-2010-0799-9512-A1, p. 2]

Aggressive standards and long---term signals are needed to fully realize this technology potential. ICCT strongly supports a strong federal rule and recognizes and applauds the constructive role that California has played in building the technical and public support for this critical rulemaking. [EPA-HQ-OAR-2010-0799-9512-A1, p. 2]

The proposed 2017---25 rules provide the long---term goals needed for manufacturers to develop consistent, long---term technology and product plans, and serves as a valuable precedent for other countries worldwide evaluating future efficiency and greenhouse gas standards. The overall stringency of the proposed rules is potentially adequate, provided that it is not eroded significantly by additional credits or changes in the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 2]

As shown in Figure 1, countries worldwide are also adopting efficiency standards and promoting technology improvements. Similar standards are needed in the US to ensure that our domestic manufacturers remain fully competitive in the world market and maintain domestic employment.

[Figure 1 can be found on p. 1 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 13]

Efficiency standards are a win for consumers, a win for energy security, a win for manufacturers, and a win for the economy. It is all paid for by oil exporting countries, as efficiency standards will both reduce their oil exports and depress the amount they get paid per barrel. [EPA-HQ-OAR-2010-0799-9512-A1, p. 13]

Efficiency standards or incentives tied directly to vehicle efficiency are necessary to capture these huge benefits for energy security and the economy. There are no other options. Certainly, care must be taken to set the standards appropriately, as has been done in the proposed rule, but rolling back or stopping the standards is equivalent to shutting down oil wells in the US. In fact, it is worse due to the missed opportunity to improve the economy. [EPA-HQ-OAR-2010-0799-9512-A1, p. 13]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 192.]

We applaud EPA, NHTSA, along with California, the Administration and the vehicle manufacturers for taking another large step along the road to a sustainable transportation system.

In closing the ultimate goal is to create a sustainable transportation system. ICCT looks forward to working with everyone involved including, first of all, including the federal and state agencies and vehicle manufacturers to help shape the best policies and programs to meet our clean air, energy security and climate change objectives.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 28-29.]

I want to congratulate you and the staff of EPA, as well as the California Resources Board, NHTSA, for building on the earlier rule and aggressively setting the stage so that the U.S. can not only catch up but surpass countries in the world in the desire to improve fuel economy, reduce greenhouse gases and reduce dependence on fossil fuels.

Organization: Investor Network on Climate Risk (INCR) - Ceres

As long-term investors, and as members of the Investor Network on Climate Risk (INCR), which represents over $10 trillion in assets, we are writing to voice our strong support for the proposed Greenhouse Gas (GHG) Emissions and Corporate Average Fuel Economy (CAFE) Standards. Independent analysis shows that strong standards will lead to job creation across the country, as well as increased profitability for the auto industry, a major driver of the economy. Further, these standards represent an unprecedented opportunity to shield us from volatile oil price spikes as well as to reduce climate risk.[EPA-HQ-OAR-2010-0799-9516-A1, p. 1]

In sum, strong standards will strengthen our economy, spur innovation, reduce both our dependence on oil and climate risk, save businesses and consumers money, and create jobs.

Accordingly, we urge the adoption of the strongest standards possible. [EPA-HQ-OAR-2010-0799-9516-A1, p. 2]

Organization: Jaguar Land Rover North America, LLC (JLRNA)

We would like to take the opportunity to thank both the Environmental Protection Agency and National Highway Traffic Safety Administration for their efforts in pulling together this proposal for a single national standard for 2017 – 2025 model years. Going forward this will continue to provide stability to enable future business and product strategy planning to take place. [EPA-HQ-OAR-2010-0799-8102-A1, cover letter]

Organization: Johnson Controls, Inc.

Johnson Controls is encouraged that NHTSA and EPA are continuing to work together on this second phase of the national program for MYs 2017-2025. Johnson Controls strongly supports the continuation of a uniform national program. It allows vehicle manufacturers to focus investments on cost-effective technologies for their fleets in order to meet the requirements of the proposed rule, while delivering products that consumers will want and represents a viable economic solution. This activity allows the energy storage manufacturer to continually innovate, advancing development, and deliver commercially viable products. [NHTSA-2010-0131-0253-A1, p. 2]

Furthermore, Johnson Controls supports the efforts of the agencies to harmonize and align their respective standards, where appropriate. Synchronizing standards improves regulatory clarity and provides certainty. [NHTSA-2010-0131-0253-A1, p. 4]

• Harmonization for this next phase of the National Program is critical to its long-term success. Johnson Controls supports the proposals to harmonize the GHG emissions and CAFE standards.

Organization: Kendall, A.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 166.]

I'd also like to state my support for the rulemaking or proposed rulemaking and offer praise for all the in-depth research that's already happened.

Organization: Kia Motors

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 100-101.]

I want to start by saying that Kia emphatically supports the proposal and believes that it is important for the agencies to set tough but feasible standards while providing flexibilities which allow each automaker to maximize their strengths in achieving the standards.

Organization: Kobus, D.

As an Environmental Scientist, I know the importance of this kind of policy in turning our future toward one of renewables in the time we need to do it. [EPA-HQ-OAR-2010-0799-1370-A1, p. 2]

The projected annual benefits of such standards by 2030 are enormous:

* 23 billion gallons of gasoline saved

* 280 million metric tons of global warming pollution avoided

* $45 billion in savings at the gas pump [EPA-HQ-OAR-2010-0799-1370-A1, p. 2]

I support the proposed standards, and I urge you to ensure that these projected benefits become a reality by keeping these standards free of loopholes that could undermine their environmental and economic benefits. [EPA-HQ-OAR-2010-0799-1370-A1, pp. 2-3]

Organization: League of Women Voters of Michigan

The League of Women Voters of Michigan supports the proposed rules for fuel efficiency and emissions standards and believes they will have significant public health and economic benefits. [NHTSA-2010-0131-0198, p.1]

We support the new standards because they will substantially reduce pollution caused by vehicle emissions. We know that air pollution damages people's health and causes premature death, particularly in children, the elderly, and people with chronic health problems. Air pollution is a major trigger of asthma attacks. [NHTSA-2010-0131-0198, p.1]

We support these regulations for the benefit of our children's health and future. [NHTSA-2010-0131-0198, p.1]

In addition to lives saved and quality of life benefits, air quality improvements have tangible economic benefits, due to better health and productivity and reduced medical expenses. The new vehicle standards will also spur innovation and investment in new technologies, which will create jobs in advanced automotive technology [NHTSA-2010-0131-0198, p.1]

Organization: Magna E-Car Systems

I'm pleased to comment in support of the 54.5 mpg proposed fuel economy standards put forward by the Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA). [EPA-HQ-OAR-2010-0799-9263-A1, p. 1]

The 54.5 mpg fuel economy standards are necessary spur investment and innovation in the hybrid and electric vehicle technologies, like Magna E-Car Systems and other automotive suppliers essential to meeting our growing 21st century transportation energy needs. [EPA-HQ-OAR-2010-0799-9263-A1, p. 2]

Organization: Manufacturers of Emission Controls Association (MECA)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 179-183.]

We believe an important opportunity exists to significantly reduce greenhouse gas emissions and improve fuel economy from passenger cars, light-duty vehicle trucks and medium duty passenger vehicles.

To conclude, MECA commends EPA, NHTSA and California for taking important steps to further reduce greenhouse gas emissions and improve fuel economy for light-duty vehicles. Our industry is prepared to do its part and deliver cost-effective advanced emission control technologies to the market for these more fuel efficient vehicles.

Organization: Marshall, C.

When I first read of the goal of 54.5 mpg for the year 2025, my reaction was that I liked the rule, but it seemed ambitious. Then I read that the rule was a negotiated rulemaking, and that the auto community participated. My spirits soared. I think negotiated rulemakings that include members of the affected community make better regulations in the long-run than imposed regulations. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

I think this particular regulation is a win-win-win program because of all the benefits for (1) reducing carbon emissions, ozone precursors, and other auto emission pollutants, (2) reducing oil consumption, imports, and extraction, and (3) making the U.S. more competitive in this technological realm. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Organization: Marz, Loren C.

I generally support the proposed rule to increase fuel economy of cars and light trucks from 2017 to 2025. EPA and NHTSA are to be commended for proposing such significant increases in the Corporate Average Fuel Economy (CAFE). Our economy and climate would benefit from such reductions in fuel consumption and greenhouse gas (GHG) emissions. [NHTSA-2010-0131-0213-A1, p.1]

Organization: Mass Comment Campaign (1,121) (World Wildlife Fund)

I am writing in support of the proposed fuel efficiency standards for new cars and light trucks. [EPA-HQ-OAR-2010-0799-5181_MASS, p.1]

The proposed standards will strengthen fuel efficiency and reduce the carbon pollution contributing to climate change. By increasing standards for new passenger cars and light trucks to 54.5 mpg by 2025, we will show the world that the U.S. is serious about curbing climate change and reducing our dependence on oil. [EPA-HQ-OAR-2010-0799-5181_MASS, p.1]

I urge both the Environmental Protection Agency and the Department of Transportation to finalize these strong standards. [EPA-HQ-OAR-2010-0799-5181_MASS, p.1]

Organization: Mass Comment Campaign (1,338) (Sierra Club-2)

America's dependence on oil puts our environment, economy and national security at risk. You recently took an important step toward addressing this problem when you outlined new vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of a 54.5 mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-11762-A1, p.1]

The projected annual benefits of such a standard by 2030 are enormous:

-$80 billion in savings at the gas pump

-23 billion gallons of gasoline saved

-280 million metric tons of global warming pollution avoided [EPA-HQ-OAR-2010-0799-11762-A1, p.1]

Moving forward, I urge you to ensure that these projected benefits become a reality by keeping this standard as strong as possible through the rulemaking process, and avoiding loopholes that could undermine the standard's environmental and economic benefits. [EPA-HQ-OAR-2010-0799-11762-A1, p.1]

Organization: Mass Comment Campaign (13,300) (National Wildlife Federation Action Fund-3)

I am submitting the following comments in support of strong fuel efficiency standards, along with the names of the 13,300 supporters of the National Wildlife Federation Action Fund who have sent similar comments to the docket via emails to a-and-r-Docket@epa.gov: [EPA-HQ-OAR-2010-0799-9965_MASS, p.1]

I support making our nation's cars and trucks more efficient to cut the carbon pollution from car exhaust that is driving global warming, which threatens the future of American wildlife. [EPA-HQ-OAR-2010-0799-9965_MASS, p.1]

Taken together, the new and proposed fuel economy standards will cut our demand for oil by 3.4 million barrels per day. That equates to nearly a third of today's transportation fuel use and it cuts carbon pollution by more than 600 million metric tons per year in 2030--that's about 10% of total US carbon pollution today. [EPA-HQ-OAR-2010-0799-9965_MASS, p.1]

These deep oil savings also mean less pressure for risky new drilling projects in the Arctic or to clear cut forest for Canadian tar sands. [EPA-HQ-OAR-2010-0799-9965_MASS, p.1]

Please move forward with strong fuel efficiency standards that cut oil use and reduce carbon pollution. [EPA-HQ-OAR-2010-0799-9965_MASS, p.1]

Organization: Mass Comment Campaign (137 (Citizens for Pennsylvania's Future (PennFuture))

I applaud you and President Obama for proposing strong new fuel economy and tailpipe pollution standards that will result in cleaner cars and cleaner air. The reduction in greenhouse gas and criteria pollution that these standards would achieve are critically important in stabilizing the climate and protecting human health. [EPA-HQ-OAR-2010-0799-3114-A1_MASS, p.1]

-By 2030, the standards would cut annual global warming pollution the equivalent of shutting down 80 coal-fired power plants for a year. This would be of tremendous benefit in slowing climate change.

-The proposed standards would create almost 500,000 jobs across the country, including 21,000 in Pennsylvania.

-The standards would save as much oil in 2030 alone as we currently import from Saudi Arabia and Iraq. [EPA-HQ-OAR-2010-0799-3114-A1_MASS, p.1]

Please make sure the proposed standards are not weakened in any way before being enacted. I am copying my Congressional representatives on this email so that they know how important a strong clean cars rule is to me, and that I want them to support a strong rule as well. Thank you for your efforts reflected in this proposal that will improve public health, enhance national security, protect the environment, and strengthen our economy. [EPA-HQ-OAR-2010-0799-3114-A1_MASS, p.1]

Organization: Mass Comment Campaign (15) (League of Conservation Voters)

I support the proposed new rules that would increase national fuel economy standards to 54.5 miles per gallon by the year 2025 and I commend the Obama administration for continuing to pursue strong, clean vehicle standards that will reduce our dangerous dependence on oil and cut global warming pollution, while creating much-needed jobs and saving drivers money at the pump. Additionally, these landmark standards remind us of the valuable role that the federal government can play in strengthening the economy and protecting the planet. [EPA-HQ-OAR-2010-0799-1555-A1_MASS, p.1]

We can do this! [EPA-HQ-OAR-2010-0799-1555-A1_MASS, p.1]

Organization: Mass Comment Campaign (15) (Sierra Club-3)

Electric vehicles can help America move beyond oil. I support your effort to improve fuel efficiency and carbon pollution standards for new cars and light trucks to 54.5 mpg and 163 grams per mile carbon pollution in 2025. These standards ensure that Americans will have better fuel efficiency and advanced technology choices in their new vehicles for years to come. [EPA-HQ-OAR-2010-0799-11763-A1, p.1]

Americans can expect real benefits from your standards. In 2030 alone, strong standards will deliver:

• $44 billion in net savings at the gas pump

• 23 billion gallons of gasoline saved

• 280 million metric tons of carbon pollution avoided. [EPA-HQ-OAR-2010-0799-11763-A1, p.1]

A well designed program will help bring electric vehicles to the market while ensuring that the pollution reduction, oil savings and consumer benefits of the standards are achieved. I urge you to ensure these standards deliver real benefits for America and avoid loopholes that could undermine the program. [EPA-HQ-OAR-2010-0799-11763-A1, p.1]

Organization: Mass Comment Campaign (195) (Environment New Mexico-1)

America's dependence on oil puts our environment, economy, and national security at risk. Your recent proposal of new fuel efficiency standards was a historic step toward addressing this problem. [EPA-HQ-OAR-2010-0799-9577-A1_MASS, p.1]

The environmental benefits of such a standard by 2030 are enormous. By 2030, we could:

-save more oil than we imported from Saudi Arabia last year, and

-slash global warming pollution by an amount equivalent to shutting down 70 coal-fired power plants. [EPA-HQ-OAR-2010-0799-9577-A1_MASS, p.1]

Moving forward, I urge you to ensure that these projected benefits become a reality by keeping this standard as strong as possible through the rulemaking process, and avoiding loopholes that could undermine the standard's environmental benefits. [EPA-HQ-OAR-2010-0799-9577-A1_MASS, p.1]

Organization: Mass Comment Campaign (2,120) (Pew Environmental Group)

I support the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, which will allow cars and light trucks to drive farther on a gallon of gas and reduce U.S. dependence on imported oil. The price of gas is once again squeezing the budgets of American families, who already are forced to cut back in other areas just to pay for basic transportation needs. [EPA-HQ-OAR-2010-0799-1247-A1_MASS, p.1]

This spring, you set a goal of reducing oil imports by one-third this decade, and in November you proposed fuel efficiency standards that will effectively double current requirements. I commend your efforts. I believe it is important to increase U.S. investment in fuel efficient technologies, save consumers money at the pump, help this country break its dependence on foreign oil, and protect the environment. Don't let these standards be watered down--protect and finalize the new fuel efficiency rules. [EPA-HQ-OAR-2010-0799-1247-A1_MASS, p.1]

Organization: Mass Comment Campaign (2,156) (Environment Michigan)

America's dependence on oil puts our environment, economy and national security at risk. You recently took an important step toward addressing this problem when you proposed new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of a 54.5 mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-9683-A1_MASS, p.1]

The projected annual benefits of such standards by 2030 are enormous:

• $45 billion in savings at the gas pump

• 23 billion gallons of gasoline saved

• 280 million metric tons of global warming pollution avoided [EPA-HQ-OAR-2010-0799-9683-A1_MASS, p.1]

I support the proposed standards, and I urge you to ensure that these projected benefits become a reality by keeping these standards free of loopholes that could undermine their environmental and economic benefits. [EPA-HQ-OAR-2010-0799-9683-A1_MASS, p.1]

Organization: Mass Comment Campaign (2,851) (Unknown Organization)

I'm writing today in support of stronger fuel-economy and carbon pollution standards for new cars and trucks. [EPA-HQ-OAR-2010-0799-9591-A1_MASS, p.1]

The EPA and the Department of Transportation have an opportunity to ensure that new vehicles in 2025 will be nearly twice as fuel efficient as vehicles today. Adopting stronger standards will drive innovation and incentivize automakers to put their best technologies to work. [EPA-HQ-OAR-2010-0799-9591-A1_MASS, p.1]

The proposed 54.5 mpg standard will be a major step forward to reduce our dependence on fossil fuels. Additionally, it will save Americans billions of dollars annually which can be reinvested in our economy. [EPA-HQ-OAR-2010-0799-9591-A1_MASS, p.1]

Please adopt the strongest fuel-economy and carbon pollution standards possible. [EPA-HQ-OAR-2010-0799-9591-A1_MASS, p.1]

Organization: Mass Comment Campaign (20) (Union of Concerned Scientists-1)

As a scientist, I believe it is vitally important to take this major step to reduce global warming emissions. As proposed, the standard would reduce U.S. emissions by as much as 290 million metric tons in 2030, the equivalent of taking over 40 million of today's typical cars and trucks off the road for a year. [EPA-HQ-OAR-2010-0799-1558-A1_MASS, p.1]

Strong fuel efficiency and vehicle emissions standards have the potential to cut America's oil dependence by 1.5 million barrels per day in 2030, more oil than we currently import from Saudi Arabia and Iraq combined. [EPA-HQ-OAR-2010-0799-1558-A1_MASS, p.1]

A strong clean car program is good for all Americans. [EPA-HQ-OAR-2010-0799-1558-A1_MASS, p.1]

Organization: Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)

UCS applauds the agencies for proposing standards that represent historic progress for American consumers, the U.S. auto industry, clean air, and U.S. energy security. However, key provisions in the proposal could erode these benefits if automakers exploit them, and should be addressed by the agencies before the standards are finalized. [EPA-HQ-OAR-2010-0799-10166-A1_MASS, p.1]

America's dangerous dependence on oil puts our environment, economy, and national security at risk. That's why I strongly support the proposed fuel efficiency and global warming emissions standards for new cars and light trucks sold in model years 2017-2025. [EPA-HQ-OAR-2010-0799-10166-A2_MASS, p.1]

The proposed standards are achievable and reasonable and will save me money at the pump, curb millions of tons of harmful global warming emissions, and save as much oil in 2030 alone as we currently import from Saudi Arabia and Iraq. They will also drive innovation in the U.S. auto industry, creating new jobs across the country. [EPA-HQ-OAR-2010-0799-10166-A2_MASS, p.1]

Though I strongly support these standards, I am concerned about possible loopholes that automakers could exploit. [EPA-HQ-OAR-2010-0799-10166-A2_MASS, p.1]

We cannot afford to delay in confronting the threats of climate change and our dangerous oil dependence. I urge you to move forward with the strongest possible standards free of harmful loopholes. [EPA-HQ-OAR-2010-0799-10166-A2_MASS, p.2]

Organization: Mass Comment Campaign (213) (Environment Virginia)

America's dependence on oil puts our environment, economy, and national security at risk. You recently took an important step toward addressing this problem when you proposed new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of a 54.5 mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-9576-A1_MASS, p.1]

The projected annual benefits of such standards by 2030 are enormous:

-- 23 billion gallons of gasoline saved

-- 280 million metric tons of global warming pollution avoided

-- $45 billion in savings at the gas pump [EPA-HQ-OAR-2010-0799-9576-A1_MASS, p.1]

I support the proposed standards, and I urge you to ensure that these projected benefits become a reality by keeping these standards free of loopholes that could undermine their environmental and economic benefits. [EPA-HQ-OAR-2010-0799-9576-A1_MASS, p.1]

Organization: Mass Comment Campaign (22,122) (Unknown Organization)

I support the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, which will allow cars and light trucks to drive farther on a gallon of gas and reduce U.S. dependence on imported oil. [EPA-HQ-OAR-2010-0799-9736_MASS, p.1]

The price of gas is once again squeezing the budgets of American families, who already are forced to cut back in other areas just to pay or basic transportation needs. [EPA-HQ-OAR-2010-0799-9736_MASS,p.1]

This spring, you set a goal of reducing oil imports by one-third this decade, and in November you proposed fuel efficiency standards that will effectively double current requirements. I commend your efforts. I believe it is important to increase U.S. investment in fuel efficient technologies, save consumers money at the pump, help this country break its dependence on foreign oil, and protect the environment. Don't let these standards be watered down -- protect and finalize the new fuel efficiency rules. [EPA-HQ-OAR-2010-0799-9736_MASS, p.1]

Organization: Mass Comment Campaign (262) (Environment New Mexico-2)

America's dependence on oil puts our environment, economy and national security at risk. You recently took an important step toward addressing this problem when you proposed new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of a 54.5 mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-9700-A1_MASS, p.1]

The projected annual benefits of such standards by 2030 are enormous:

• $45 billion in savings at the gas pump

• 23 billion gallons of gasoline saved

• 280 million metric tons of global warming pollution avoided [EPA-HQ-OAR-2010-0799-9700-A1_MASS, p.1]

I support the proposed standards, and I urge you to ensure that these projected benefits become a reality by keeping these standards free of loopholes that could undermine their environmental and economic benefits. [EPA-HQ-OAR-2010-0799-9700-A1_MASS, p.1]

Organization: Mass Comment Campaign (27,108) (Unknown Organization)

I am writing in support of the strong fuel-efficiency and carbon pollution standards for new cars and trucks. [EPA-HQ-OAR-2010-0799-9596-A1_MASS, p.1]

The benefits of strong standards are overwhelming. By giving automakers a clear direction for improving their new vehicles, EPA and DOT together are ensuring that new vehicles in 2025 will be almost twice as efficient as new vehicles today. I know the automakers can do better and these standards will ensure that automakers innovate and put the best technologies to work to cut dangerous carbon pollution and help America move beyond oil. [EPA-HQ-OAR-2010-0799-9596-A1_MASS, p.1]

I applaud the EPA and DOT for working together to propose these standards that will strengthen fuel efficiency and carbon pollution standards for new passenger cars and trucks to 54.5 mpg by 2025. It matters to me that we take this critical step to curb the dangers of climate disruption, cut our addiction to oil, and keep billions of dollars in our economy instead of spending them on oil. [EPA-HQ-OAR-2010-0799-9596-A1_MASS,p.1]

Organization: Mass Comment campaign (3,855) (National Wildlife Federation Action Fund-2)

I support making our nation's cars and trucks more efficient to cut the carbon pollution from car exhaust that is driving global warming, which threatens the future of American wildlife. [EPA-HQ-OAR-2010-0799-1557-A1_MASS, p.1]

Taken together, the new and proposed fuel economy standards will cut our demand for oil by 3.4 million barrels per day. That equates to nearly a third of today's transportation fuel use and it cuts carbon pollution by more than 600 million metric tons per year in 2030--that's about 10% of total US carbon pollution today. [EPA-HQ-OAR-2010-0799-1557-A1_MAS, p.1]

These deep oil savings also mean less pressure for risky new drilling projects in the Arctic or to clear cut forest for Canadian tar sands. [EPA-HQ-OAR-2010-0799-1557-A1_MASS, p.1]

Please move forward with strong fuel efficiency standards that cut oil use and reduce carbon pollution. [EPA-HQ-OAR-2010-0799-1557-A1_MASS, p.1]

Organization: Mass Comment Campaign (375) (Union of Concerned Scientists-2)

America's dangerous dependence on oil puts our environment, economy, and national security at risk. That's why I strongly support the proposed fuel efficiency and global warming emissions standards for new cars and light trucks sold in model years 2017-2025. [EPA-HQ-OAR-2010-0799-1246-A1_MASS, p.1]

The proposed standards are achievable and reasonable and will save me money at the pump, curb millions of tons of harmful global warming emissions, and save as much oil in 2030 alone as we currently import from Saudi Arabia and Iraq. They will also drive innovation in the U.S. auto industry, creating new jobs across the country. [EPA-HQ-OAR-2010-0799-1246-A1_MASS, p.1]

Though I strongly support these standards, I am concerned about possible loopholes that automakers could exploit. [EPA-HQ-OAR-2010-0799-1246-A1_MASS, p.1]

We cannot afford to delay in confronting the threats of climate change and our dangerous oil dependence. I urge you to move forward with the strongest possible standards free of harmful loopholes. [EPA-HQ-OAR-2010-0799-1246-A1_MASS, p.1]

We cannot afford to delay in confronting the threats of climate change and our dangerous oil dependence. I urge you to move forward with the strongest possible standards free of harmful loopholes. [EPA-HQ-OAR-2010-0799-1246-A1_MASS, p.1]

Organization: Mass Comment Campaign (39) (Unknown Organization)

I strongly support the proposed CAFE standards for cars and light trucks from 2017 to 2025. The goals summarized in these standards (Docket ID No. EPA-HQ-OAR-2010-0799 and/or NHTSA-2010-0131) show a promising future for the nation's health, environment, national security, and economy. [EPA-HQ-OAR-2010-0799-1245-A1_MASS, p.1]

The estimates released by the White House show the potential for an enormous reduction in green house gas emissions. The decrease in air pollution will be substantial. I am happy to support this strong environmental regulation - one that will directly improve citizen health. [EPA-HQ-OAR-2010-0799-1245-A1_MASS, p.1]

Organization: Mass Comment Campaign (39,464) (Environmental Defense Fund (EDF))

I strongly support the proposed new fuel efficiency and greenhouse gas standards for cars and trucks to require cars and trucks to an average 54.5 miles per gallon by model year 2025. [EPA-HQ-OAR-2010-0799-9590-A1_MASS, p.1]

Together with the 'Phase One' model year 2012-2016 rule finalized in 2010, these tough new standards would more than double America's average fuel economy and are expected to:

-- Save families an estimated $8,200 in fuel savings over the lifetime of a new vehicle by 2025, for a total of $1.7 trillion in national fuel savings over the life of the program.

-- Reduce oil consumption by an estimated 2.2 million barrels a day by 2025 more than our daily 2010 oil imports from the entire Persian Gulf.

-- Reduce carbon dioxide pollution by over 6 billion metric tons over the life of the program equivalent to the emissions from the United States in 2010. [EPA-HQ-OAR-2010-0799-9590-A1_MASS, p.1]

Generating less pollution, putting more money in consumers' wallets, easing our addiction to oil, modernizing America's fleet of cars and trucks what's not to like? [EPA-HQ-OAR-2010-0799-9590-A1_MASS, p.1]

I am thrilled that this dramatic and bold proposal has earned the support of automakers, autoworkers, national security groups, environmental groups, and many other key stakeholders. And I am proud to add my support to this important rule. [EPA-HQ-OAR-2010-0799-9590-A1_MASS, p.1]

Organization: Mass Comment Campaign (399) (Rhode Island Sierra Club)

Dear President Obama,

You recently highlighted the urgency of moving beyond oil and pledged to reduce America's dependence on foreign oil by one third. [EPA-HQ-OAR-2010-0799-11761-A1, p.1]

You can deliver on your pledge to American people by setting new standards requiring cars and light trucks to achieve the standard of at least 60 miles per gallon and emit no more than 143 grams of global warming pollution per mile by 2025. [EPA-HQ-OAR-2010-0799-11761-A1, p.1]

Using American ingenuity, we can build cars and trucks that will reduce our dependence on oil by 2.5 million barrels each day by 2030 - that's almost 50 percent more oil than we currently import from the entire Persian Gulf. We need your leadership to set strong pollution and fuel efficiency standards for new cars and trucks that will help break our county's dependence on oil. [EPA-HQ-OAR-2010-0799-11761-A1, p.1]

Organization: Mass Comment Campaign (4,505) (Unknown Organization)

The proposed fuel-efficiency and greenhouse gas standards for passenger vehicles and light trucks are a laudable step in reducing dangerous global warming, increasing national security and improving our economy. Compared to business as usual, they will prevent millions of tons of global warming emissions, save consumers billions of dollars at the gas pump and reduce America's dependence on dirty fossil fuels. But these rules can and should be significantly strengthened. [EPA-HQ-OAR-2010-0799-9595-A1_MASS, p.1]

Increasing the fuel efficiency of our vehicles is the low-hanging fruit in the battle against dangerous climate change, and we can no longer afford to pass up this tremendous opportunity. Please adopt the strongest possible standards and close the SUV loophole. [EPA-HQ-OAR-2010-0799-9595-A1_MASS, p.1]

Organization: Mass Comment Campaign (45) (Environment Minnesota)

America's dependence on oil puts our environment, economy, and national security at risk. Your recent proposal of new fuel efficiency standards was a historic step toward addressing this problem. [EPA-HQ-OAR-2010-0799-9588-A1_MASS, p.1]

THANK YOU. Let's please keep working on cutting our dependence on oil. [EPA-HQ-OAR-2010-0799-9588-A1_MASS, p.1]

The environmental benefits of such a standard by 2030 are enormous:

- save more oil than we imported from Saudi Arabia last year, and

- slash global warming pollution by an amount equivalent to shutting down 70 coal-fired power plants. [EPA-HQ-OAR-2010-0799-9588-A1_MASS, p.1]

Moving forward, I urge you to ensure that these projected benefits become a reality by keeping this standard as strong as possible through the rule-making process, and avoiding loopholes that could undermine the standard's environmental benefits. [EPA-HQ-OAR-2010-0799-9588-A1_MASS, p.1]

Organization: Mass Comment Campaign (61) (The Social Justice Group))

We support these improved fuel efficiency standards not only for our own personal benefit, but also for the sake of our national security, our economy, and the world's environment. [EPA-HQ-OAR-2010-0799-7406-A1_MASS, p.2]

THE ISSUE: Support clean air and fight global warming by endorsing the Obama administration's proposal to raise automobile fuel efficiency standards.

The Obama administration has proposed a historic 54.5 miles per gallon fuel efficiency standard. Under this new proposal, it is estimated that American drivers would collectively save $80 billion a year at the pump, a savings that over time would outweigh the cost of the lower emission technology. We would make a significant dent in carbon emissions and drastically reduce our need for oil consumption in transportation. The new standard would mean that cars and trucks would achieve roughly double the fuel economy of the average vehicle on the road today. [EPA-HQ-OAR-2010-0799-7406-A1_MASS, p.6]

Some cars can already meet these standards, but most do not. This is a huge opportunity for American automakers. To remain competitive in the global marketplace. our automakers must make more fuel-efficient vehicles. These new standards will encourage investments in technology and produce new jobs in our domestic auto industry. [EPA-HQ-OAR-2010-0799-7406-A1_MASS, p.6]

The EPA estimates the 54.5 mpg standards will:

** save consumers a net of $4,400. based on the expected fuel savings and the cost of the lower emissions technology

** reduce U.S. dependence on oil by 1 .7 million barrels per day. more than we imported from Saudi Arabia and Iraq in 2010:

** reduce harmful air pollution that causes climate change by 297 million metric tons per year by 2030, which is equivalent to the annual emissions of 76 coal-fired power plants. [EPA-HQ-OAR-2010-0799-7406-A1_MASS, p.6]

This petition will be forwarded to the administration during the public comment period for these proposed standards. [EPA-HQ-OAR-2010-0799-7406-A1_MASS, p.6]

Organization: Mass Comment Campaign (680) (PennEvironment)

America's dependence on oil puts our environment, economy, and national security at risk. You recently took an important step toward addressing this problem when you proposed new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of a 54.5mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-1556-A1_MASS, p.1]

The projected annual benefits of such standards by 2030 are enormous:

* 23 billion gallons of gasoline saved

* 280 million metric tons of global warming pollution avoided

* $45 billion in savings at the gas pump [EPA-HQ-OAR-2010-0799-1556-A1_MASS, p.1]

I support the proposed standards, and I urge you to ensure that these projected benefits become a reality by keeping these standards free of loopholes that could undermine their environmental and economic benefits. [EPA-HQ-OAR-2010-0799-1556-A1_MASS, p.1]

Organization: Mass Comment Campaign (80) (Unknown Organization)

I support the Environmental Protection Agency's (EPA) joint proposal with the National Highway Traffic Safety Administration (NHTSA) to improve fuel economy and reduce greenhouse gas (GHG) emissions for passenger cars and light-trucks for model years 2017 through 2025. The proposed fleet-wide average of 49.6 mpg will create a new generation of clean vehicles and respond to our country's critical need to reduce oil consumption. [EPA-HQ-OAR-2010-0799-9682-A1_MASS, p.1]

This proposal will save four billion barrels of oil and two million metric tons of greenhouse gas emissions over the lifetime of those vehicles. The proposal also incentivizes the expanded production of hybrid and electric vehicles, which will further reduce our dependence on foreign oil and cut greenhouse gases. [EPA-HQ-OAR-2010-0799-9682-A1_MASS, p.1]

I also strongly urge the agencies to carefully evaluate whether basing these fuel standards on the size of a vehicle will incentivize manufacturers to build larger vehicles. Ensuring manufacturers do not benefit from building larger vehicles that emit more emissions is fundamental to the success of the National Program. [EPA-HQ-OAR-2010-0799-9682-A1_MASS, p.1]

Organization: Mass Comment Campaign (9,570) (Unknown Organization)

The proposed standards are achievable and reasonable and will save me money at the pump, curb millions of tons of harmful global warming emissions, and save as much oil in 2030 alone as we currently import from Saudi Arabia and Iraq. They will also drive innovation in the U.S. auto industry, creating new jobs across the country. [EPA-HQ-OAR-2010-0799-9578-A1_MASS, p.1]

Though I strongly support these standards, I am concerned about possible loopholes that automakers could exploit. [EPA-HQ-OAR-2010-0799-9578-A1_MASS, p.1]

We cannot afford to delay in confronting the threats of climate change and our dangerous oil dependence. I urge you to move forward with the strongest possible standards free of harmful loopholes. [EPA-HQ-OAR-2010-0799-9578-A1_MASS, p.1]

Organization: Mass Comment Campaign (927) (Sierra Club-1)

I am writing in support of the proposed fuel-efficiency and carbon pollution standards for new cars and trucks. [EPA-HQ-OAR-2010-0799-1554-A1_MASS, p.1]

I applaud the EPA and DOT for working together to propose these standards that will strengthen fuel efficiency and carbon pollution standards for new passenger cars and trucks to 54.5 mpg by 2025. This is a critical step we can take to curb climate disruption, cut our addiction to oil, and keep billions of dollars in our economy instead of spending them on oil. [EPA-HQ-OAR-2010-0799-1554-A1_MASS, p.1]

In these tough economic times I celebrate these efforts because they will promote innovation and job growth not just in the automotive industry but across the nation, all while helping the U.S. cut dangerous carbon pollution and our addiction to oil. [EPA-HQ-OAR-2010-0799-1554-A1_MASS, p.1]

Once again, I strongly support these vitally important standards that will protect our environment, economy, and national security. I urge both the EPA and DOT to finalize these strong standards. [EPA-HQ-OAR-2010-0799-1554-A1_MASS, p.1]

Organization: Mass Comment Campaign (99) (Environment Texas)

America's dependence on oil puts our environment, economy and national security at risk. You recently took an important step toward addressing this problem when you proposed new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of a 54.5 mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-9701-A1_MASS, p.1]

The projected annual benefits of such standards by 2030 are enormous:

• $45 billion in savings at the gas pump

• 23 billion gallons of gasoline saved

• 280 million metric tons of global warming pollution avoided [EPA-HQ-OAR-2010-0799-9701-A1_MASS, p.1]

I support the proposed standards, and I urge you to ensure that these projected benefits become a reality by keeping these standards free of loopholes that could undermine their environmental and economic benefits.[EPA-HQ-OAR-2010-0799-9701-A1_MASS, p.1]

Organization: Mass Comment Campaign (Multiple Submitters) (Unknown Organization)

The rising price of gas is once again squeezing the budgets of American families, who are being forced to cut back in other areas to pay for basic transportation needs. Please take action to ensure that cars and light trucks can drive farther on a gallon of gas and reduce our dependence on imported oil. [NHTSA-2010-0131-0219-A1_MASS, p.1]

This spring, you set a goal of reducing oil imports by one-third this decade. Fuels efficiency standards of up to 60 miles per gallon by 2025 would increase investments in fuel efficient technologies, save consumers money at the pump, and help the United States break its cycle of addiction to foreign oil by saving more than 1.3 billion barrels. I urge you to support new fuel efficiency standards of up to 60 miles per gallon. [NHTSA-2010-0131-0219-A1_MASS,p.1]

The rising price of gas is once again squeezing the budgets of American families, who are being forced to cut back in other areas to pay for basic transportation needs. Please take action to ensure that cars and light trucks can drive farther on a gallon of gas and reduce our dependence on imported oil. [NHTSA-2010-0131-0219-A1_MASS, p.1]

This spring, you set a goal of reducing oil imports by one-third this decade. Fuels efficiency standards of up to 60 miles per gallon by 2025 would increase investments in fuel efficient technologies, save consumers money at the pump, and help the United States break its cycle of addiction to foreign oil by saving more than 1.3 billion barrels. I urge you to support new fuel efficiency standards of up to 60 miles per gallon. [NHTSA-2010-0131-0219-A1_MASS,p.1]

Organization: Mazda North American Operations

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 63.]

As one of the 13 auto makers that signed the letter of commitment, Mazda welcomes the opportunity to be a partner in helping to advance a continued, harmonized national program on fuel economy and greenhouse gas emissions for the 2017 to 2025 model years. While offering manufacturers the certainty of knowing the fuel economy targets for many years into the future, the proposed standards do represent an extreme technical challenge for the auto industry, and especially for smaller automakers, such as Mazda, who have more limited resources to develop and market advanced technology vehicles. Nonetheless, we are committed to making our best efforts to meet the proposed targets.

Organization: Mehrotra, Rahul

Thank you for even considering proposing a rule to raise average fuel economy standards. [NHTSA-2010-0131-0206, p.1]

Organization: Mercedes-Benz USA, LLC

DAG fully supports the agencies' effort to create a unified program that allows one product pathway towards compliance. [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

Organization: Michigan House of Representatives, 49th District

I'm State Representative Jim Ananich of Flint and I have the distinct honor of serving Michigan's 49th House District. I'm pleased to comment today on and in support of the proposed 54.5 mpg fuel economy standards proposed by the Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA). [EPA-HQ-OAR-2010-0799-7983-A1, p. 1]

Since I took office last year, my top priority has been to improve our economy and help get the people of Genesee County and Michigan back to work. The proposed 54.5 mpg fuel economy standards will be a significant step forward in accomplishing these goals. These standards will help create jobs, save consumers money, and keep the members of our armed services out of harm's way. [EPA-HQ-OAR-2010-0799-7983-A1, p. 1]

The Obama Administration and automakers deserve recognition for their collaborative efforts to reach an agreement on fuel economy at a time when leaders in Washington cannot seem to agree on anything. This shows that we can rise above the divisive rhetoric of our politics and reach agreement on commonsense solutions to our most pressing issues. [EPA-HQ-OAR-2010-0799-7983-A1, p. 2]

Organization: Michigan State House of Representatives

I'm State Rep. Jim Townsend & am pleased to offer my comments on the fuel economy standards proposed by the Environmental Protection Agency & National Highway Traffic Safety Administration.

I serve the 26th Michigan House District, which covers the cities of Madison Heights & Royal Oak. My district includes many people who work in the auto industry & many more earn a living as a result of those who do. I also have worked in the auto industry & would like to recognize the automakers leadership in reaching an agreement with the Obama Administration that's as good for jobs & the economy as it is for consumers. [EPA-HQ-OAR-2010-0799-9175, p. 1]

The 54.5 mpg fuel economy standard will create good paying jobs for American autoworkers. A recent study conducted by the United Auto Workers, Natural Resources Defense Council & National Wildlife Federation found that the proposed standards would create over 150,000 jobs at over 500 facilities that produce parts for advanced internal combustion engines, hybrid & alternative fuel vehicles, plug-in electric vehicles, & shared components. Here in Michigan the standards will create a little more than 38,000 jobs at nearly 100 facilities. [EPA-HQ-OAR-2010-0799-9175, p. 1]

Also, for consumers, who spend about $2,000 a year on fuel, these fuel economy standards can quickly add up to big savings. Americans spend over $1.3 billion each day on gas. Greater fuel efficiency will save consumers up to $6,600 in fuel costs over the lifecycle of a 2025 model. [EPA-HQ-OAR-2010-0799-9175, p. 1]

Finally, the big growth markets for the auto industry are dominated by countries whose consumers expect leadership in fuel economy. These standards will help prepare the industry for the export market & give American-made cars a leg up in other countries. [EPA-HQ-OAR-2010-0799-9175, pp. 1-2]

These standards will spur innovation & encourage the development the hybrids, electric, & more fuel efficient vehicles crucial to the continued success of automakers. I thank the EPA & NHTSA for opportunity to comment. [EPA-HQ-OAR-2010-0799-9175, p. 2]

Organization: Michigan State Senate, District 18

I'm pleased to comment today on the fuel economy rules proposed by the Environmental Protection Agency (EPA) and Department of Transportation (DOT), and to lend my strong support for standards that would increase the fuel efficiency of light duty vehicles to a fleet wide average of 54.5 mpg. [EPA-HQ-OAR-2010-0799-5594-A1, p. 1]

In short, as the auto industry enters this new chapter, all the signs point to a market for more fuel efficient cars, and all the roads to get there run through Greater Metro Detroit. [EPA-HQ-OAR-2010-0799-5594-A1, p. 2]

Organization: Miller, P.

Though I heartily support the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, we can do better!!! [EPA-HQ-OAR-2010-0799-1755-A1, p. 1]

This spring, you set a goal of reducing oil imports by one-third this decade, (make that two-thirds and you would be closer to what we need) and in November you proposed fuel efficiency standards that will effectively double current requirements. I commend your efforts. I believe it is important to increase U.S. investment in fuel efficient technologies, save consumers money at the pump, help this country break its dependence on foreign oil, and protect the environment. Don't let these standards be watered down--protect and finalize the new fuel efficiency rules. [EPA-HQ-OAR-2010-0799-1755-A1, p. 1]

Organization: Minnesota Department of Commerce

I support the stated goals of the proposed rule to improve fuel economy of light-duty vehicles for model years 2017–2025 as a means to further reduce greenhouse gas emissions and reduce oil consumption. [EPA-HQ-OAR-2010-0799-7363-A1, p. 1]

Organization: Mitsubishi Motors R&D of America, Inc. (MRDA)

On May 21, 2010, President Obama issued a Memorandum requesting EPA and NHTSA to jointly develop a coordinated National Program to improve fuel efficiency and reduce GHG emissions of passenger cars and light-duty trucks for MYs 2017 through 2025. To that end, EPA and NHTSA, with continuous consultation from the California Air Resources Board (CARB), published several notices leading up to the NPRM. Mitsubishi Motors applauds the efforts of the Administration and agencies to follow through on their commitment to continue the National Program to regulate GHG emissions and fuel economy of light-duty vehicles for MY 2017 and later MYs. For this reason, in July 2011, Mitsubishi Motors demonstrated its support of the National Program by signing a letter of commitment to the process and structure of the overall program as described in the NPRM. [EPA-HQ-OAR-2010-0799-9507-A1, p.2]

Mitsubishi Motors is appreciative of the inclusive rulemaking process. We stand committed to the continued development of a National Program based on the technical, economic and consumer realities of the United States light-duty automotive market. [EPA-HQ-OAR-2010-0799-9507-A1, p.2]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 95-99.]

Mitsubishi Motors applauds the efforts of the Obama administration and agency staff to follow through on their commitments to continue one national program on the federal level for these model years.

Similarly, Mitsubishi Motors is appreciative of the inclusive process that led to the publication of this NPRM. Mitsubishi Motors stands committed to continuing the development of the national program based on technical, economic and consumer realities in the United States' light-duty automotive market. To ensure these realities are fully considered in setting fuel economy and greenhouse gas standards for these later model years included in this rulemaking, a midterm evaluation is critical to this process.

Organization: Moravian College

Please do your part, in bringing our nation of drivers into welcoming a new generation of automobiles that are more fuel efficient and burn their fuels more cleanly. We need this for energy independence as well as health benefits of a cleaner environment. [EPA-HQ-OAR-2010-0799-5536-A1, p. 1]

Organization: Motor & Equipment Manufacturers Association (MEMA)

In order to meet regulatory requirements and consumer demand for cleaner, more fuel-efficient advanced vehicles, motor vehicle parts manufacturers have increasingly taken on a significant role in the research, development, engineering, and manufacturing of the advanced technologies necessary to meet these ever-increasing goals. Working together, suppliers and vehicle manufacturers develop an assortment of technologies and products that improve vehicle performance, safety, fuel efficiency, and emissions. These components and systems are rigorously tested on a range of platforms, each with varying degrees of performance. [EPA-HQ-OAR-2010-0799-9478-A1, p.1]

MEMA is encouraged that NHTSA and EPA are continuing to work together on this second phase of the National Program for Model Years (MY) 2017-2025. MEMA strongly supports the continuation of a uniform, footprint-based National Program because it permits vehicle manufacturers to focus their resources on investing in the best technologies available for their fleet in order to achieve the levels prescribed by the program. This, in turn, feeds the ability of the supplier base to continually innovate, to advance development, and to turn research technologies into commercially viable products. [EPA-HQ-OAR-2010-0799-9478-A1, pp.1-2]

Furthermore, MEMA supports the efforts of the agencies to harmonize and align their respective standards, where appropriate. Synchronizing improves regulatory clarity and provides certainty. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

Harmonization for this next phase of the National Program is important to its long-term success. MEMA supports the proposals to harmonize the GHG emissions and CAFE standards, as appropriate. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

MEMA welcomes and supports the proposals to harmonize the GHG emissions and CAFE standards, as appropriate. Synchronizing improves regulatory clarity and provides certainty. We support the agencies’ decision to parallel the efficiency credits and fuel consumption improvement values for compliance calculations for their respective GHG emissions and CAFE standards programs. Specifically, aligning the air conditioning and off-cycle elements such that the efficiency improvement credits have an equivalent fuel consumption improvement in the compliance calculations is an appropriate, and needed, improvement to the National Program. Credits are an important tool and can be positively applied and provide the industry necessary options to achieve future standards. [EPA-HQ-OAR-2010-0799-9478-A1, p.4]

Excluding the internal harmonization between the respective EPA and NHTSA programs in this NPRM, MEMA asks the agencies to take into account other regulatory endeavors that may impact the ultimate efficacy of National Program standards. For example, subtle differences in California’s program (compared to the National Program), and the state’s other vehicle-related requirements, are just different enough such that suppliers have to conduct multiple compliance test regimens. On the global front, a multitude of similar, but different regulations and requirements for other parts of the world, further burden companies with compounding testing and compliance costs. [EPA-HQ-OAR-2010-0799-9478-A1, p.4]

A truly harmonized regulatory framework will help with economies of scale and avert multiple layers of compliance programs. Essentially, since motor vehicle parts manufacturers bear a significant proportion of research, development and testing costs, any opportunities for government entities to synergize, harmonize and align related regulatory frameworks and compliance needs are important and should be considered by all stakeholders and, where appropriate, take corrective action. Continued cooperation and harmonization of the EPA, DOT/NHTSA, the State of California and others is extremely important for the long-term success of the Program. [EPA-HQ-OAR-2010-0799-9478-A1, pp.4-5]

Motor vehicle parts manufacturers develop a wide variety of technologies and products that continually improve vehicle performance, safety, fuel efficiency, and emissions. The entire motor vehicle industry needs consistent, long-term policies so that all stakeholders can more effectively meet the regulatory requirements and consumer demands for cleaner, efficient advanced technology vehicles and thrive in the current economic environment. MEMA and the supplier industry are committed to policies that enable the introduction of new technologies needed to support sustainable mobility. MEMA strongly supports the continuation of a uniform National Program because it permits vehicle manufacturers to focus their resources on investing in the best technologies available for their fleet in order to achieve the levels prescribed by the program. Furthermore, these standards must be technology-neutral, performance-based, not impose “preferred technology” pathways and allow for a fully competitive marketplace. [EPA-HQ-OAR-2010-0799-9478-A1, p.13]

Organization: National Association of Clean Air Agencies (NACAA)

NACAA is very pleased to support this proposal. We note also that there is a broad group of stakeholders that supports EPA’s and NHTSA’s actions to continue, and build upon, the national programs adopted in 2010 to reduce greenhouse gas (GHG) emissions from, and improve the fuel economy of, model year (MY) 2011 through 2016 light-duty vehicles (LDVs). On July 29, 2010, 13 major automakers sent letters to EPA and the U.S. Department of Transportation expressing their support for a next phase of the national vehicle program to further reduce GHG emissions and increase fuel economy. These automakers together manufacture over 90 percent of all vehicles sold in the U.S. In their respective letters, the automakers commit to “working with EPA and NHTSA, the states, and other stakeholders to help our country address the need to reduce dependence on oil, to save consumers money, and to ensure regulatory predictability and certainty by developing this kind of strong, coordinated National Program.” The California Air Resources Board, the United Auto Workers and numerous environmental and consumer organizations have also offered their support for this program. [EPA-HQ-OAR-2010-0799-8084-A1, p. 1]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 37.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 33.]

This proposal to further the LDV GHG emissions and CAFE standards programs is also consistent with and complementary to the federal GHG and fuel economy standards for MY 2014 through 2018 medium and heavy-duty vehicles adopted in 2011. [EPA-HQ-OAR-2010-0799-8084-A1, p. 2]

In 2007, 31 percent of all U.S. GHGs were emitted by mobile sources, which, since 1990, have been the fastest-growing source of U.S. GHG emissions. LDVs emit carbon dioxide (CO_2), methane, nitrous oxide and hydrofluorocarbons (HFCs) and are responsible for almost 60 percent of all mobile source GHG emissions. CO_2 emissions in 2007 represented approximately 94 percent of all LDV GHG emissions (including HFCs). [EPA-HQ-OAR-2010-0799-8084-A1, p. 2]

Relative to the national objective of improving energy and national security by reducing dependence on foreign oil, net petroleum imports in 2009 accounted for about 51 percent of U.S. petroleum consumption. In that same year, transportation was responsible for approximately 71 percent of petroleum consumption, with LDVs accounting for about 60 percent of transportation oil use, which equates to about 40 percent of all U.S. oil consumption. [EPA-HQ-OAR-2010-0799-8084-A1, p. 2]

The estimated benefits of this proposal (over the lifetime of the MY 2017 through 2025 vehicles) are a reduction in oil consumption of 4 billion barrels and a reduction in GHG emissions of 2 billion metric tons. The anticipated fuel savings amounts to $347 billion to $444 billion (based on a gasoline price of $3.38 per gallon in 2015 and $3.64 per gallon in 2020). [EPA-HQ-OAR-2010-0799-8084-A1, p. 2]

The total estimated costs of this program (over the lifetime of the MY 2017 through 2025 vehicles) will be around $140 billion and the total monetized benefits will be on the order of $449 billion to $561 billion, for a net benefit to society in the range of $311 billion to $421 billion. [EPA-HQ-OAR-2010-0799-8084-A1, p. 2]

Based on EPA's analysis, the fuel cost savings will "far outweigh" higher vehicle costs. For consumers, the new standards would add, on average, about $2,000 to the cost of a new vehicle in MY 2025. However, a consumer who pays cash when purchasing a MY 2025 vehicle can expect to make up this cost in about three and a half years and, thereafter, continue to accrue savings in fuels costs. A consumer who purchases a MY 2025 vehicle using credit will save more each year in fuel costs than the amount of the increased payments on the car loan. [EPA-HQ-OAR-2010-0799-8084-A1, p. 2]

The co-benefits to be derived from such a program extend far beyond climate change, fuel savings and energy security, and include the following:

- reduced $PM_{2.5}$ and NO_x emissions due to reduced gasoline distribution emissions associated with tanker trucks; [EPA-HQ-OAR-2010-0799-8084-A1, p. 2]

- mitigation of some of the disproportionate adverse health impacts (including those associated with toxic air pollutants and criteria pollutants) on environmental justice communities affected by emissions from high traffic and located near gasoline refining and distribution facilities; [EPA-HQ-OAR-2010-0799-8084-A1, p. 3]
- reduced adverse health impacts near roadways due to the increase in cleaner vehicles;
- reduced risk of accidental spills of volatile crude oil due to proportional reduction in oil imports via marine tankers;
- buffering against gasoline price volatility for consumers and a hedge against rising fuel prices due to the increased use of domestic and alternative fuel sources;
- economic growth and the creation of high-quality jobs across the country due to the need for the innovative automotive technologies upon which the standards rely; and
- reduced hydrocarbon emissions due to lower fuel throughput at retail distribution outlets. [EPA-HQ-OAR-2010-0799-8084-A1, p. 3]

Fourth, NACAA is aware that state and local governments are struggling to maintain current road infrastructure and to fund enhancements. NACAA believes that the issue of how to provide longterm transportation infrastructure funding is a critical national need that should be addressed. However, the debate over long-term transportation funding should not affect the level or delay adoption of the proposed fuel economy standards. [EPA-HQ-OAR-2010-0799-8084-A1, p. 4]

Finally, NACAA urges that EPA and NHTSA ensure that this final rule is promulgated by July 2012, as planned. Further, NACAA encourages EPA, upon promulgation of this rule, to begin assessing the efficacy of another phase of standards to apply to post-2025 MY vehicles. [EPA-HQ-OAR-2010-0799-8084-A1, p. 4]

Organization: National Automobile Dealers Association (NADA)

NADA continues to believe that a single national light-duty vehicle fuel-economy/GHG program is essential to the extent that it avoids any unworkable patchwork of state laws. The EISA mandate for a fleet-wide combined fuel economy average of at least 35 miles per gallon by 2020 (with a commensurate reduction in GHGs of at least 30 percent), followed by standards set to achieve maximum achievable performance is Congress' clear direction. [EPA-HQ-OAR-2010-0799-9575-A1, p. 12]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 69.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 92.]

NADA supports a single national program for light vehicle fuel economy.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 56-57.]

NADA strongly believes that the issues and goals involved in this rulemaking are national in scope, and that California regulators should not be dictating national policy or setting fuel economy standards.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 69.]

NADA supports the single national program governing light-duty vehicle fuel economy as that is what Congress sought in 2007 when it enacted the Energy Independence and Security Act.

Organization: National Caucus of Environmental Legislators

America's deepening dependence on oil puts our economy, environment, and national security at risk. The introduction of new global warming pollution and vehicle efficiency standards ensuring new cars and light trucks meet the equivalent of 54.5 miles per gallon fleet-wide by 2025 is an important step in the right direction. These standards will reduce pollution and save Americans money through greater fuel efficiency. [EPA-HQ-OAR-2010-0799-9443-A1, p. 1]

Reducing the nation’s reliance on foreign oil is an important objective that these standards can help to achieve. It is critical that the consumer and environmental benefits of these standards are maximized by rejecting efforts to weaken the standards. We support keeping the standards as strong as possible through the rulemaking process. [EPA-HQ-OAR-2010-0799-9443-A1, p. 1]

Americans understand that cleaner, more fuel-efficient vehicles can help break our addiction to oil, and they overwhelmingly support strong fuel efficiency and pollution standards. In a recent poll, Consumer Reports found that 80 percent of survey respondents favored raising the national standard to around 55-mpg. [EPA-HQ-OAR-2010-0799-9443-A1, p. 1]

The standards proposed for 2017-2025 will greatly decrease the average new vehicle's global warming pollution, cutting annual nationwide emissions by 280 million metric tons in 2030— equivalent to the annual emissions from roughly 70 coal-fired power plants. The standards outlined will also reduce U.S. gasoline consumption by 23 billion gallons in 2030— equivalent to the 2010 U.S. imports from Saudi Arabia and Iraq. Allowing for loopholes to weaken these standards would needlessly send money to foreign countries and extend our dependence on oil. [EPA-HQ-OAR-2010-0799-9443-A1, pp. 1-2]

These standards will determine the efficiency of cars and trucks our children will drive decades from now. As state legislators, on behalf of our constituents we applaud efforts to break America's addiction to oil, keep billions of dollars in our economy and reduce the threat of climate change. We urge your administration to ensure that the standards developed for 2017-2025 vehicles are as strong as possible, in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-9443-A1, p. 2]

Organization: National Propane Gas Association (NPGA)

NPGA supports the Environmental Protection Agency's (EPA) and the National Highway Traffic Safety Administration's (NHTSA) goals to further reduce Greenhouse Gas (GHG) emissions and improve fuel economy for light-duty vehicles for model years 2017-2025. Further, we support the President's request to address global climate change and reduce our nation's oil consumption. And, we firmly believe the use of Liquefied Petroleum Gas (LPG), an EPA approved clean alternative fuel, will help reduce our nation's dependency on oil and reduce CO_2 emissions, a stated goal of the subject proposed rulemaking. [EPA-HQ-OAR-2010-0799-9482-A1, p. 1]

Organization: National Wildlife Federation (NWF)

The standards are also an example of how industry, labor, and conservationists can and must continue to work together to use the Clean Air Act as a tool for innovation and to solve critical environmental, energy and economic challenges that we face. [EPA-HQ-OAR-2010-0799-9887-A2, pp. 1-2]

The proposed 2017-2025 standards will approximately double fuel economy of our cars, SUV's and pickups from today's levels to an average of 54.5 miles per gallon by 2025. Vehicles built under the standard will save America 4 billion barrels of oil and 2 billion metric tons of carbon pollution. [EPA-HQ-OAR-2010-0799-9887-A2, pp. 2-3]

Taken together with the 2012-2016 light duty standards and the 2014-2018 medium and heavy duty standards being implemented now, the proposed standards will cut carbon pollution over 650 million metric tons a year in 2030 – about 10% of total US carbon pollution today. This is an historic step forward to combat our climate challenge. [EPA-HQ-OAR-2010-0799-9887-A2, p. 3]

Taken together these standards are also the largest step the nation has ever taken to cut oil use and enhance our energy security. As shown in Figure 1, above, these standards together will cut our demand for oil by 3.6 million barrels per day; more than all the oil we import today from the Persian Gulf, Venezuela and Russia combined. [Figure 1 can be found on p. 2 of Docket number EPA-HQ-OAR-2010-0799-9887-A2] [EPA-HQ-OAR-2010-0799-9887-A2, p. 3]

And as we are ensuring that every car and truck uses less fuel, steady expansion of electric and advanced vehicle technology can take us even further– to a mass market, high performance vehicle fleet that uses little oil and produces near zero pollution. [EPA-HQ-OAR-2010-0799-9887-A2, p. 3]

Deep cuts in the oil we need means less pressure for risky new drilling projects in the Arctic or for clear cutting forest for Canadian tar sands. It means less need for new pipelines, fewer leaks and threats to people, wildlife and our public and private lands. [EPA-HQ-OAR-2010-0799-9887-A2, p. 3]

These standards show we can take real steps to roll back climate change and protect wildlife for generations to come. [EPA-HQ-OAR-2010-0799-9887-A2, p. 3]

The proposed standard is also critical to regain and sustain our leadership in the most advanced vehicle technologies - including hybrid and electric cars and trucks. The strong long term targets embodied in the 2017-2025 rule are essential to justify ongoing investments in hybrid and electric technology necessary to combat high fuel prices and environmental challenges, and to ensure the competitiveness of the American auto industry in a changing world. Weto [*sic*] meet to build robust network of domestic innovators, suppliers and manufacturers ready to meet national and global demand, to ensure an industry able to lead the clean global auto industry of the future, and to ensure consumers are protected against the real and present risk of rising and volatile oil prices. [EPA-HQ-OAR-2010-0799-9887-A2, pp. 5-6]

Standards are also strongly supported by the public.

A recent survey by Consumers Reports found 80% of car owners in support of fuel economy standards that would achieve 55 mpg by 2025, and the agencies' recent field hearings were swamped with overwhelmingly positive testimony. 14 The public knows fuel economy standards work. They work for wildlife, they work American families, they work for the auto industry and autoworkers and they work for the economy. [EPA-HQ-OAR-2010-0799-9887-A2, p. 7]

We thank the agencies for their clarity of vision and perseverance in developing this essential standard. [EPA-HQ-OAR-2010-0799-9887-A2, p. 7]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 27-28.]

America needs a strong, clean industrial sector that employs billions with good jobs while producing the most efficient products possible. Our members depend on all kinds of vehicles from small hybrids to cars to pick-ups to off-road vehicles. We still believe in the potential of the American auto industry.

Over the past two years, the hard working people here in Detroit and in Ohio and Missouri and North Carolina and all across the country have been proving dramatically that they have what it takes for America to lead in a prosperous clean energy future. Their efforts, combined with these new standards, and effective public and private investment show how an industry can be retooled to be vibrant in the present and even more relevant and powerful in the future. Strong standards through the 2025 year are critical to staying on this path.

The standards are also an example of how an industry and labor and the conservation community can and must work together to use the Clean Air Act as a tool for innovation and to solve critical and environmental energy and economic changes we face today.

These standards deliver.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 31-32.]

The proposed standard is also critical to regain and sustain our leadership in the most advanced vehicle technologies including hybrid electric cars and trucks. These technologies will be critical to combating high fuel prices and environmental challenges into the future and the competitiveness of the American auto industry in a changing world.

Investments in cutting edge electric vehicles and other innovations increase fuel efficiency across the board, and long-term targets create certainty in a world tyrannized by volatile oil prices and availability.

Together we must work to build a robust network of innovators, suppliers and caring consumers to lead in the global economy for the auto industry's future.

---

14 http://news.consumerreports.org/cars/2011/11/survey-car-owners-want-better-fuel-economy-supportincreased- standards.html. This recent survey finds comparable results to many previous polls.

Organization: Natural Resources Defense Council (NRDC)

The U.S. EPA and NHTSA proposed passenger vehicle carbon pollution fuel economy standards for model years 2017-2025 is the third historic agreement to bring us cleaner cars and trucks. The latest announcement follows on the joint NHSTA and EPA rules for model years 2012 to 2016 passenger vehicles and for model years 2014 to 2018 medium- and heavy-duty trucks.1,2 These agreements exemplify how leadership, partnership, and compromise can help solve the enormous environmental, economic and energy challenges facing our country. [EPA-HQ-OAR-2010-0799-9472-A2, p. 2]

The model year 2017-2025 National Program standards will act as a powerful economic stimulus by keeping a total of $350 billion in the U.S. economy by 2030 instead of sending it overseas to Saudi Arabia, Iran, Venezuela and other oil-exporting nations.5 This higher level of investment in the U.S. economy, especially auto manufacturing, will result in roughly half a million more jobs by 2030.6 [EPA-HQ-OAR-2010-0799-9472-A2, p. 3]

American consumers are already benefiting from the more fuel-efficient vehicle options available due to the current National Program requirements and will benefit more as the standards get stronger. By 2030, the new agreement will provide the equivalent of a $330 tax rebate to every American household.12 Compared to today’s average vehicle, a 54.5 mpg-equivalent standard will save the average driver $6,600 over the vehicle’s lifetime, with most drivers seeing benefits immediately in the form of reduced total monthly payments for the car and fuel. [EPA-HQ-OAR-2010-0799-9472-A2, p. 5]

The most recent clean car agreement enjoys an unprecedented breadth and depth of support including from almost all of the auto industry14, and from Republicans and Democrats15, consumer advocacy groups16, 17, national security groups18, 19, economists20, business leaders21, small business owners22, the UAW23, and environmental organizations24. [EPA-HQ-OAR-2010-0799-9472-A2, p. 6]

Numerous polls show that a large majority of Americans support substantially strengthening of clean car standards. A Consumer Federation of America found 60 percent of American consumers support a 60 mpg standard with a payback of three and five years.25 A poll for national environmental groups found 83 percent of voters support a 60 mpg standard with a payback of four years.26 Polls by the investor group Ceres found 56 percent of Michigan voters and 59 percent of Ohio voters support 60 mpg with a payback time of four years.27 According to a recent poll by the Consumer Reports National Research Center, 80 percent agreed that fuel economy standards should require auto manufacturers to increase the overall fleet average to at least 55 miles per gallon by 2025.28 Finally, a poll by the Public Policy Institute of California found that an overwhelming 84 percent of Californians support requiring automakers to significantly improve fuel efficiency, including 76 percent of Republicans.29 [EPA-HQ-OAR-2010-0799-9472-A2, pp. 6-7]

Small business owners – many of whom buy cars and trucks for their businesses – also strongly support higher fuel economy standards. A recent poll by the Small Business Majority found that 87 percent of small business owners overwhelmingly support adopting strong fuel efficiency standards now and 80 percent support requiring the auto industry to increase mileage to 60 mpg by 2025.30 According to the Small Business Majority poll: “Small business owners say that in order to survive and remain competitive, they need automobiles that get better gas mileage and cost less to operate.” [EPA-HQ-OAR-2010-0799-9472-A2, p. 7]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 198-201.]

The proposed standards are a giant step forward. The standards are good for the environment, consumers, and the economy. The standards ensure that as a nation we are investing in our future instead of being beholden to a status quo of heavy dependence on oil which is fueling dangerous emissions of carbon pollution and draining our economic wealth.

These standards will help protect our economy by helping reduce extreme weather events such as hurricanes, heat waves and floods.

The national program and this latest set of standards are examples of good government. Despite the gridlock in Congress, the EPA, NHTSA and the California Air Resources Board have demonstrated an effective partnership to develop policies that meet the objectives of the Clean Air Act and the Energy Policy and Conservation Act.

Each agency has played an important and critical role in shaping this proposal. This proposal is also a product of discussions with the automotive industry, labor, environmental, and consumer stakeholders, and the result is a strong set of standards.

1 EPA and NHTSA. "Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for MY 2012-2016 (Final Rule)." 75 FR 25324.

2 EPA and NHTSA. "Greenhouse Gas Emission Standards and Fuel Efficiency Standards for Medium- and Heavy-duty Engines and Vehicles." 76 FR 57106.

5 NRDC calculation based on EPA NPRM (76 FR 74854) estimates of oil consumption reduction, import fractions and incremental vehicle costs. Fuel prices from AEO 2011.

6 Ceres. More Jobs per Gallon: How Strong Fuel Economy/GHG Standards will Fuel American Jobs. July 2011.

12 UCS and NRDC. "Saving Money at the Gas Pump: State-by-State Consumer Savings from Stronger Fuel Efficiency and Carbon Pollution Standards." September 2011.

14 Commitment letters from 13 automakers to Secretary LaHood and Administrator Jackson. Dated July 2011 . Letters from BMW, Chrysler, Ford, GM, Honda, Hyundai, Jaguar Land Rover, Kia, Mazda, Mitsubishi, Nissan, Toyota Volvo. http://epa.gov/otaq/climate/regulations.htm

15 Bipartisan Joint Letter to President Obama. Signed by The Honorable Diane Feinstein, US state Congress, D-California, et al. Dated July 25, 2011.

16 American Consumer Advocacy Groups. Joint Letter to President Obama. Signed by Consumer Federation of American, et al. Dated September 22, 2010.

17 Consumer Union. Consumers Reports Says 56 Miles-Per-Gallon Vehicle Standard is Good, but 62 MPG is Better Aggressive Fuel Economy Standard by 2025 Will Save Consumers Money and Dramatically Cut Oil Consumption. Press Release. June 30, 2011.

18 Securing America's Future Energy. Oil Savings from the Proposed 2017–2025 Fuel Economy Standards. Issue Brief. June 8, 2011

19 Ashley Howe. Truman Thanks Obama in POLITICO. Blog. Truman Project. August 3, 2011. http://www.operationfree.net/2011/08/03/truman-advertisement-featured-in-politico/

20 American Economist Group Joint Letter to President Obama. Signed by Michael Anderson, Ph.D. University of California, Berkley, et al. Dated June 7, 2011

21 Environmental Entrepreneurs (E2) Joint Letter to President Obama. Signed by Curtis Abbott, Lucesco Lighting Inc., et al. Date June 30, 2011

22 Small Business Majority. Small Businesses Strongly Support Raising Fuel Efficiency Standards. Press Release. July 29, 2011

23 UAW. UAW supports administration proposal on light-duty vehicle CAFE and greenhouse gas emissions reductions. Press Release. July 29, 2011.

24 Environmental Advocacy Groups Joint Letter to President Obama. Signed by Cindy Shogan Alaskan Wilderness League, et al. Dated September 9, 2010.

25 Consumer Federation of America. The Consumer Case for Strong Fuel Economy Standards: 56 MPG by 2025 Works. Press Release. June 28, 2011.

26 The Mellman Group, Inc. Memo to Environment America, The National Resources Defense Council, Sierra Club, & Union of Concerned Scientists. Voters Overwhelmingly Support Stricter Fuel Efficiency Standards. Released September 15, 2010.

27 Ceres. Voters in America's Auto & Manufacturing Heartland Want 60 MPG Fuel Economy Standards by 2025. Press release. May 25, 2011.

28 Consumer Reports National Research Center. Consumer Reports Survey: Large Majority of Consumers Support Stronger Fuel Economy Standards to Save Money, Lower Fuel Costs. Press Release. November 14, 2011.

29 Public Policy Institute of California. PPIC Statewide Survey: Californians and the Environment. Press Release of Findings. July 27, 2011.

30 Small Business Majority. Small Businesses Strongly Support Raising Fuel Efficiency Standards. Fuel Efficiency Poll. July 29, 2011.

Organization: New Jersey Senate, Third Legislative District

America's deepening dependence on oil puts our economy, environment, and national security at risk. I am writing to applaud you for taking an important step to confront the dangers of this dependence by proposing new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of the 54.5-mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-9970-A1, p. 1]

I applaud you for seizing this historic opportunity to do more than any previous administration to break America's dependence on oil, keep billions of dollars in our economy and reduce the threat of climate change, I urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rulemaking process in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-9970-A1, p. 1]

Organization: New York City Council, 35th District

Your administration has taken important steps to confront the dangers of our dependence on oil—most recently, proposing new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of the 54.5-mpg fleetwide standard by 2025. I am writing to applaud you for developing these standards. [EPA-HQ-OAR-2010-0799-9901-A2, p. 1]

These standards will determine the efficiency of cars and trucks our children will drive decades from now. I applaud you for seizing this historic opportunity to do more than any previous administration to break America's addiction to oil, keep billions of dollars in our economy and reduce the threat of climate change. I urge you to ensure that the standards your administration develops for 2017-2025 vehicles are as strong as possible, in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-9901-A2, p. 1]

Organization: New York State Assembly Committee on Government Operations

Your administration has taken important steps to confront the dangers of our dependence on oil—most recently, proposing new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of the 54.5-mpg fleetwide standard by 2025. I am writing to applaud you for developing these standards. [EPA-HQ-OAR-2010-0799-9453-A2, p. 1]

These standards will determine the efficiency of cars and trucks our children will drive decades from now. I commend you for seizing this historic opportunity to do more than any previous administration to break America's addiction to oil, keep billions of dollars in our economy and reduce the threat of global climate change. I urge you to ensure that the standards your administration develops for 2017-2025 vehicles are as strong as possible, in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-9453-A2, p. 1]

Organization: New York State Senate, 26th District

Your administration has taken important steps to confront the dangers of our dependence on oil-most recently, proposing new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of the 54.5-mpg fleetwide standard by 2025. I am writing to applaud you for developing these standards. [EPA-HQ-OAR-2010-0799-9884-A1, p. 1]

These standards will determine the efficiency of cars and trucks our country's children will drive decades from now. I applaud you for seizing this historic opportunity to do more than any previous administration to break America's addiction to oil, keep billions of dollars in our economy and reduce the threat of climate change. I urge you to ensure that the standards your administration develops for 2017-2025 vehicles are as strong as possible. in order to maximize their benefits for our economy, our environment, and our national security. [EPA-HQ-OAR-2010-0799-9884-A1, pp. 1-2]

Organization: Nissan North America, Inc.

Nissan remains committed to the program and to the terms and conditions set forth in Nissan's letter dated July 29, 2011, and in the agencies' Second Supplemental Notice of Intent published in the Federal Register on the same date. The following comments further demonstrate the overall benefits and technological underpinning of the proposal, as well as identifying additional improvements and corresponding benefits. [EPA-HQ-OAR-2010-0799-9471-A1, p.1]

Nissan's environmental commitment extends beyond the regulatory program. As a leader in electric powertrains, Nissan brought to market the all-electric Nissan LEAF and will continue to drive development and deployment of electric powertrains. Nissan also remains dedicated to continued improvements in internal-combustion powered vehicles, safe weight reduction and advances in traditional hybrid technology. Nissan expects its fleet during the model years covered by this rulemaking to include a diverse array of technologies and powertrains. [EPA-HQ-OAR-2010-0799-9471-A1, p.1]

Industry-wide success in meeting the proposed standards will certainly depend on the extent to which the market for new vehicle technologies develops during the covered model years. Widespread adoption of battery electric vehicles and other advanced powertrains requires not only industry to broadly embrace investment in these technologies, but also for consumers to adopt these new technologies. Given the planning and lead-times necessary for such a market shift, the proposed incentives for battery electric powertrains (multiplier credit and zero emissions compliance value) and other proposed incentives are essential. Only through the government's support of industrial innovation in the transportation sector can the U.S. achieve its long-term greenhouse gas (GHG) public policy objectives. Not including the proposed Incentives In the final rulemaking will discourage manufacturer investment in these technologies, and signal a significant change in Administration policy and delay the realization of the substantial long-term greenhouse gas reductions associated with these transformational, 'game changing' vehicle technologies. [EPA-HQ-OAR-2010-0799-9471-A1, pp.1-2]

Nissan believes that the proposed program strikes an appropriate balance between aggressive standards and the encouragement of advanced technologies necessary to meet those standards. As proposed, the regulatory program recognizes that although the automobile manufacturers must invest significantly in technological advances, the economic and market conditions-both within the U.S. and globally-must also support such an investment. Thus the structure of the proposal-with standards firmly established for MYs 2017-2021 and with a robust mid-term evaluation of technological and market feasibility for MYs 2022-2025-is essential. [EPA-HQ-OAR-2010-0799-9471-A1, p.2]

Nissan commends the agencies for the comprehensive joint rulemaking, and strongly supports global efforts to curb greenhouse gas emissions. Success in reducing the impact of mobile source greenhouse gas emissions requires a coordinated and thoughtful effort that goes beyond the automobile industry, however. Nissan, for its part, is committed to improving existing internal combustion engines and investing in a future of electric vehicles and other advanced powertrains to reduce the transportation sector's GHG emissions. [EPA-HQ-OAR-2010-0799-9471-A1, p.24]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 126-131.]

Nissan supports the national program and remains committed to the regulatory program as set forth in the notices of intent and the proposed rule.

The proposal also represents a significant leap forward in advancing more environmentally friendly vehicles and zero emissions transportation.

The national program represents a significant step forward in reducing greenhouse gas emissions and fuel consumption through a unified federal and state regulatory structure. We appreciate the efforts of federal agencies and California in providing a regulatory program that allows for one product pathway to compliance and that includes incentives to promote longer term public policy.

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 69-74.]

The proposed rule is a positive step that builds on the progress made under the current CAFE rules, and will achieve important economic and environmental benefits.

These proposed new standards will significantly reduce fuel consumption and greenhouse gas emissions and expand the use of alternative fuels.

We urge EPA to continue to evaluate the greenhouse gas effects of these provisions, and take the necessary steps to ensure preservation of the overall goals of the program.

In summary, the joint EPA/NHTSA effort to address greenhouse gas emissions and fuel consumption through this rulemaking is a positive step that builds on the progress of the current CAFE rules.

Organization: Oblong Land Conservancy

Your agency, with the President's support, is taking the right steps to improve fuel economy in America's fleet of vehicles.

In order to reduce our dependence on foreign oil, and all the costs and dangers that this economic relationship entails, we must wean ourselves from this wasteful source.

There are immense savings at the gas pumps that will benefit almost all Americans, and contribute to economic prosperity.

It will substantially reduce air pollution and reduce the threats of global warming.

Please do your share to maximize the clear benefits to America's economy, our national security and our environment.

The Oblong Land Conservancy commends your efforts, and supports these goals. [EPA-HQ-OAR-2010-0799-9915-A1, p. 1]

Organization: Pennsylvania Department of Environmental Protection

The Commonwealth of Pennsylvania appreciates the opportunity to submit comments on the "2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas (GHG) Emissions and Corporate Average Fuel Economy Standards" proposed by the Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) on December 1, 2011. The proposal is designed to "represent a continued harmonized and consistent National Program" (76 FR 74854). We are pleased that EPA and NHTSA (the agencies) continue to work with automobile manufacturers to harness the large number of available energy efficient engine technologies that offer the potential to increase the nation's energy efficiency. This continued initiative to ensure greater vehicle fuel efficiency will reduce the nation's dependence on foreign sources of energy, help promote an American energy infrastructure that will support the country's transportation needs and save motorists money at the pump. [EPA-HQ-OAR-2010-0799-7821-A1, p. 1]

The benefits of the agencies' final coordinated rule in terms of fuel savings will be substantial. According to the proposed rule, from model years 2017 through 2025, the fuel cost savings will outweigh the higher vehicle costs based on today's price of gasoline. A consumer who pays cash when purchasing a model year 2025 vehicle can expect to recover the $2,000 extra cost for a vehicle through fuel savings in about 3.5 years. Also, according to the proposed rulemaking, passenger cars will see an average annualized rate of carbon dioxide (CO_2) emission reductions of five percent. For light trucks, the average annualized rate of CO_2 emission reductions would be 3.5 percent per year for model years 2017 through 2021 and increase to five percent per year for model years 2022 through 2025. Finally, the proposed rule indicates that the new fuel economy standards will also result in small reductions in criteria pollutant emissions. The Commonwealth urges the agencies to ensure that all of the proposed emission reduction milestones are achieved expeditiously. [EPA-HQ-OAR-2010-0799-7821-A1, p. 2]

It is also imperative that EPA and NHTSA harmonize the National Program with the program established by the California Air Resources Board (CARB) for motor vehicles. For example, harmonization will allow automobile manufacturers to produce similar vehicles for states that require CARB-certified vehicles and those that require Federally-certified vehicles. We support harmonization because of its significant benefits for both the environment and consumers. [EPA-HQ-OAR-2010-0799-7821-A1, p. 2]

We support the agencies' proposed rulemaking (CAFE and GHG emission standards) for motor vehicles including passenger cars and light-duty trucks, which would create more fuel-efficient light-duty vehicles in this country as governments in countries around the world are considering similar efforts. Keeping the nation's vehicle fleet fuel efficient is important for reducing our dependence on unreliable sources of fossil fuels, promoting a homegrown energy supply and infrastructure, and maintaining our nation's competitiveness and standard of living. We also support EPA's efforts to harmonize Federal light-duty vehicle standards with light-duty vehicle standards developed by CARB. [EPA-HQ-OAR-2010-0799-7821-A1, p. 5]

Finally, EPA should properly account for GHG emissions, which includes extending the harmonization effort with CARB by adopting the same position on test fuels as the California program. [EPA-HQ-OAR-2010-0799-7821-A1, p. 5]

Organization: Pennsylvania State Senate et al.

America's deepening dependence on oil puts our economy, environment, and national security at risk. Your administration has taken important steps to confront this challenge-most recently, announcing an outline for a new phase of fuel efficiency and auto pollution standards through 2025. I am writing to applaud you for developing these standards, and urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rulemaking process. [EPA-HQ-OAR-2010-0799-9914-A1, p. 1]

Americans understand that cleaner, more fuel-efficient vehicles can help break our addiction to oil, and they overwhelmingly support strong fuel efficiency and pollution standards. In a nationwide poll, the Mellman Group found that 83 percent of likely voters favored a 60 miles-per-gallon standard -- even if it would add $3,000 to the up-front price of a new vehicle. Strong standards maximize consumer savings at the pump. [EPA-HQ-OAR-2010-0799-9914-A1, p. 1]

The standards your administration has outlined for 2017-2025 will greatly decrease the average new vehicle's global warming pollution, cutting annual nationwide emissions by 280 million metric tons in 2030-equivalent to the annual emissions from 72 coal-fired power plants. The standards you outlined will also reduce U.S. gasoline consumption by 23 billion gallons in 2030-roughly equivalent to the 2010 U.S. imports from Saudi Arabia and Iraq. Allowing for loopholes to weaken these standards would needlessly send money to foreign countries and extend our dependence on oil. [EPA-HQ-OAR-2010-0799-9914-A1, p. 1]

These standards will determine the efficiency of cars and trucks our children will drive decades from now. We applaud you for seizing a historic opportunity to do more than any previous president to break America's addiction to oil, keep billions of dollars in our economy and reduce the threat of climate change. I urge you to ensure that the standards your administration develops for 2017-2025 vehicles are as strong as possible, in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-9914-A1, p. 1]

Organization: Pew Charitable Trusts

Attached please find comments from The Pew Charitable Trusts and more than 36,000 Americans in support of the proposed fuel efficiency rules for model years 2017-2025 light duty cars and trucks under consideration by the Environmental Protection Agency and Department of Transportation. [EPA-HQ-OAR-2010-0799-9496, p. 1]

The proposed rule would double passenger vehicle fuel efficiency from the level enacted in 2007, a significant increase that will save consumers money at the pump, blunt the economic and national security threats presented by oil dependence and price volatility, and help American manufacturers develop new technologies that spur investment in research, development, and production of advanced vehicles. [EPA-HQ-OAR-2010-0799-9496-A2, p. 1]

Pew has long supported higher federal fuel economy standards. In 2007, we worked to help achieve overwhelming bipartisan support in Congress on the first fuel economy increase in 30 years. [EPA-HQ-OAR-2010-0799-9496-A2, p. 1]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2009-2010-0799-11788, p.17]

In addition to the petition submitted to President Obama on November 1, 2011 and signed by more than 31,000 Americans, Pew has, and will continue to, highlight the importance of fuel efficiency with auto supply manufacturers, working families, and veterans at events around the nation. We have also attached a follow-up petition that includes more than 36,000 signatures of Americans that urge EPA and DOT to adopt a strong final rule. [EPA-HQ-OAR-2010-0799-9496-A2, p. 2]

Dear Mr. President:

I support the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, which will allow cars and light trucks to drive farther on a gallon of gas and reduce U.S. dependence on imported oil. The price of gas is once again squeezing the budgets of American families, who already are forced to cut back in other areas just to pay for basic transportation needs. [EPA-HQ-OAR-2010-0799-9496-A3, p. 1]

This spring, you set a goal of reducing oil imports by one-third this decade, and in November you proposed fuel efficiency standards that will effectively double current requirements. I commend your efforts. I believe it is important to increase U.S. investment in fuel efficient technologies, save consumers money at the pump, help this country break its dependence on foreign oil, and protect the environment. Don’t let these standards be watered down—protect and finalize the new fuel efficiency rules. [EPA-HQ-OAR-2010-0799-9496-A3, p. 1]

[Note: This comment was signed by 36,000 Americans.]

We have also sought to inform the public and policymakers across the nation about the dangers of U.S. oil dependence to our nation's economy, national security, and to the lives of the U.S. servicemen and women who defend oil transit routes and chokepoints around the world. [These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp.17-18.]

Organization: Porsche Cars North America, Inc. (PCNA)

Porsche supports the goal of setting ambitious targets for long-range reduction in fuel consumption. Most importantly, it is critical to establish a single National standard for GHG so that manufacturers are able to integrate technologies consistently. [EPA-HQ-OAR-2010-0799-9264-A1, p. 2]

Organization: Renewable Energy Long Island

I applaud you for seizing this historic opportunity to do more than any previous administration to break America's dependence on oil, keep billions of dollars in our economy and reduce the threat of climate change. I urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rulemaking process, in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-7933-A1, p. 1]

Organization: Renewable Fuels Association (RFA)

As detailed in the attached comments, RFA is supportive of the stated goals of the CAFE/GHG program. However, we are concerned by several elements of the proposal, as summarized below: [EPA-HQ-OAR-2010-0799-9490-A1, p.1]

While RFA is supportive of the stated goals of the program, which are "to address global climate change and to reduce oil consumption," we are concerned by several elements of the proposal that appear to discourage the future production of flexible fuel vehicles (FFVs) capable of operating on gasoline blends containing greater than 15%vol. fuel ethanol (E15). [EPA-HQ-OAR-2010-0799-9490-A1, p.3]

Additionally, we believe the agencies must ensure the final CAFE/GHG regulation is harmonized with, and does not undermine the requirements of, other related regulations, such as the Renewable Fuel Standard (RFS) and pending "Tier 3" rules. Vehicle engines, emissions controls, and motor fuels operate as highly integrated systems. Therefore, as they finalize the CAFE/GHG rule, the agencies must carefully consider what fuel properties and characteristics will be necessary for automakers to achieve the proposed standards. [EPA-HQ-OAR-2010-0799-9490-A1, p.3]

In closing, RFA remains steadfastly supportive of consistent, science-based policies that reduce petroleum consumption, decrease transportation costs, and reduce GHG emissions. These objectives work in concert to enhance national energy security, strengthen our economy, and protect our environment. While we applaud EPA/NHTSA for endeavoring toward these goals in the current CAFE/GHG proposal, we are concerned that progress may be undermined by several elements of the proposal that discourage the future production of FFVs. [EPA-HQ-OAR-2010-0799-9490-A1, p.8]

Organization: Ross, D.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 240-244.]

In our very imperfect world, the ongoing political grid-lock, the proposed CAFE and greenhouse gas standards are the single most effective policy option on the table for addressing our over-dependence on fossil fuels.

As an economist and a local government official, I'm clear that the benefits of these standards far outweigh the cost for our environment and our economy.

I thank everyone involved in developing the proposed standards. I thank you for your patience in hearing me out, and urge finalization of strong standards for model years 2017, 2025 this summer.

Organization: Salinas, A.

With transportation accounting for 20% of all U.S. greenhouse gas emissions, the new fuel-efficiency and global warming pollution reduction proposals by the Department of Transportation and the EPA are encouraging. However, the proposed rules need strengthening. [EPA-HQ-OAR-2010-0799-7119-A1, p. 1]

Organization: Securing America's Future Energy (SAFE)

SAFE has long advocated increasing the fuel economy of the light-duty vehicle (LDV) fleet. Doing so is, in the short- to medium-term, one of the most effective ways to decrease the petroleum intensity of our economy, thereby enhancing our energy, economic, and national security. For that reason, SAFE strongly supports the general framework and overall fuel economy and emission reduction goals that were the subject of an agreement between the automakers and the regulators last summer, whose components were incorporated into the proposed rule. SAFE also believes that the rule has the potential to help support the adoption of grid-enabled vehicles (GEVs) (electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs)), which rely entirely on grid-delivered electricity or use substantially less liquid fuels than traditional vehicles with internal combustion engines, substantially enhancing our economic and national security by relying on a diverse portfolio of domestic fuels, with stable prices, instead of the highly volatile global oil market. [EPA-HQ-OAR-2010-0799-9518-A1, p. 2]

SAFE expresses its appreciation for the agencies ongoing efforts to improve fuel economy in order to improve our national and economic security, and hopes that its comments contribute to the agencies ongoing efforts to do so as in a responsible and aggressive manner. SAFE is committed to providing the regulating agencies any possible assistance that will help them as they proceed through this rulemaking process. [EPA-HQ-OAR-2010-0799-9518-A1, p. 19]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 148.]

We strongly support the agreement reached last summer between the administration and automakers and its embodiment in the proposed regulation because of the amount of the oil savings that it will achieve.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

The Sierra Club, Environment America, Safe Climate Campaign and the Clean Air Council applaud EPA and NHTSA for proposing to strengthen vehicle fuel efficiency and greenhouse gas standards for MY 2017-2025 cars and light trucks – what is now called the National Program. Together with standards for 2012-2016 vehicles, this Administration has put new cars on a path to being twice as efficient in 2025 as new vehicles today. More stringent fuel economy and greenhouse gas standards are the biggest single step we can take to curb dangerous climate change and tackle our addiction to oil. [EPA-HQ-OAR-2010-0799-9549-A2, p. 1]

Conclusion: When finalized, strong 2017-2025 standards will provide automakers with a longterm direction for safely improving fuel efficiency and reducing greenhouse gas emissions from new vehicles. There is no doubt that with these standards, combined with the historic standards that these agencies completed for 2012-2016, are the biggest single step we can take to help move American beyond oil and curb dangerous carbon pollution. This long-term path that a full 14 years of standards offers is critical and will unleash innovation. [EPA-HQ-OAR-2010-0799-9549-A2, p. 11]

As proposed, these standards are demanding significant change in the vehicles automakers make and sell with the promise that these vehicles will emit less greenhouse gas emissions. These changes will benefit consumers, our economy, national security and environment. A strong final rule is needed, with limits on the overall impacts of the flexibilities the proposal offers. To fully realize the promised oil savings and emission reductions from these standards the agencies must ensure the program continues though 2025. [EPA-HQ-OAR-2010-0799-9549-A2, p. 11]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 121-126.]

Sierra Club applauds EPA and NHTSA for proposing to strengthen vehicle efficiency and greenhouse gas standards for model year 2017 to 2025 cars and light trucks. Together with the standards for 2012 to 2016 vehicles this Administration has put new cars on the path of being twice as efficient as new cars today. By 2025, the new vehicles are expected to average 54.5 miles per gallon and emit 162 grams per mile of greenhouse gas pollution delivering to consumers vehicles down the road according to the agencies will average 37 miles per gallon.

These standards are the biggest single step we can take to reduce greenhouse gas emissions and tackle our oil addiction. Cars and light trucks drive our addiction to oil to consume over 8 million barrels of oil a day and CO_2 nearly 20 percent of U.S. climate-destructing pollution. Our oil addiction drains our economy as much as $1 billion every day costing jobs and threatening our national security.

There is no doubt with these standards that these are the biggest single steps we can take to move Americans beyond oil and curb carbon pollution. However, more needs to be done. Even with more efficient vehicle standards, we must increase our transportation choices to reduce how much people drive and reduce the carbon content of the fuels we use. When it comes to vehicles, however, President Obama and EPA and NHTSA have guaranteed progress for the next 13 years. We urge EPA and DOT to finalize strong standards in July.

Organization: Society of the Plastics Industry, Inc. (SPI)

SPI appreciates the proposal’s response to the critical need to address global climate change. Our policy statement on climate change encourages continued research to develop strategies to conserve energy and reduce emissions, and expresses our belief in the importance of developing innovative technologies to minimize the impact on climate change. [EPA-HQ-OAR-2010-0799-9492-A1, pp.1-2]

We thank the EPA and NHTSA for collaborating with vehicle manufacturers in the development of the NPRM, [EPA-HQ-OAR-2010-0799-9492-A1, p.2]

Organization: South Coast AQMD

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 68-71.]

The South Coast AQMD staff supports overall the proposed greenhouse gas emissions standards and timeline. The proposed emissions standards and companion fuel economy standards will result in a significant reduction in greenhouse gas emissions, as well as provide crucially important co-benefits in reducing criteria emissions in support of attainment of federal and state air quality standards for ozone and particulates.

In summary, we strongly urge U.S. EPA and NHTSA to finalize the proposed rule as early as possible.

Organization: State of New York The Assembly

Your administration has taken important steps to confront the dangers of our dependence on oil most recently, proposing new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of the 54.5-mpg fleetwide standard by 2025. I am writing to applaud you for developing these standards. [EPA-HQ-OAR-2010-0799-10155-A1, p. 1]

These standards will determine the efficiency of cars and trucks our children will drive decades from now. I applaud you for seizing this historic opportunity to do more than any previous administration to break America's addiction to oil, keep billions of dollars in our economy and reduce the threat of climate change. I urge you to ensure that the standards your administration develops for 2017-2025 vehicles are as strong as possible, in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-10155-A1, p. 1]

Organization: Tarazevich, Yegor

While I do strongly support reducing air pollution and oil dependency by increasing the fuel economy [NHTSA-2010-0131-0199, p.1]

According to a new study from University of Michigan researchers Kate Whitefoot and Steven Skerlos, with new CAFE standard it would be more profitable for automakers to keep building larger and larger vehicles:

http://www.washingtonpost.com/blogs/ezra-klein/post/cafe-loophole-could-lead-to-bigger-cars/2011/12/14/gIQA3bGLuO_blog.html [NHTSA-2010-0131-0199, p.1]

Organization: Tesla Motors, Inc.

As a California based manufacturer devoted solely to the development and manufacture of electric vehicles and electric vehicle batteries and drivetrain systems, Tesla views EPA's and NHTSA's proposal as a step in the right direction. As detailed in these comments, however, Tesla believes there is still room for improvement, as well as a better understanding of the increasing capabilities and decreasing costs of electric vehicle technology. [EPA-HQ-OAR-2010-0799-9539-A2, p. 1]

As an initial matter, Tesla Motors supports the general direction of EPA’s and NHTSA’s proposal. [EPA-HQ-OAR-2010-0799-9539-A2, p. 3]

Tesla Motors again appreciates the opportunity to provide these comments. With reduction of our dependence on petroleum as the exclusive source of transportation fuel a national imperative, EPA and NHTSA are in a unique position to establish a final rule that encourages the promotes the development of alternatives like electric vehicle technology. As Tesla continues to demonstrate the feasibility of ever improving EV technology at lower price points, we would encourage EPA and NHTSA to continue a leadership position by enacting a final rule that pushes technology forward. [EPA-HQ-OAR-2010-0799-9539-A2, pp. 7-8]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 90-93.]

We are largely supportive of the effort to increase vehicle efficiency and to reduce greenhouse gas emissions, and I thank you for your work in this sector.

Thus, while we applaud EPA and NHTSA's proposal, we believe that it represents a good start, but it doesn't properly -- that it doesn't fully take into account the full potential of EV technology. And so we believe that standards could, indeed, be much higher.

Organization: The Catskill Center for Conservation and Development

America's deepening dependence on oil puts our economy, environment, and national security at risk. I am writing to applaud you for taking an important step to confront the dangers of this dependence by proposing new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of the 54.5-mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-9913-A1, p. 1]

I applaud you for seizing this historic opportunity to do more than any previous administration to break America's dependence on oil, keep billions of dollars in our economy and reduce the threat of climate change. I urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rulemaking process, in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-9913-A1, p. 1]

Organization: Toyota Motor North America

Toyota views the joint EPA and NHTSA rulemaking process as a necessary step toward our ultimate objective - a true, single national standard governing fuel economy and greenhouse gas emissions in the future. [EPA-HQ-OAR-2010-0799-9586-A1, p.1]

Toyota appreciates the measures the agencies have taken to further harmonize certain aspects of the two regulations. Yet, the different underlying legal frameworks of each agency prevent harmonization in a few key areas, resulting in differing levels of stringency. [EPA-HQ-OAR-2010-0799-9586-A1, p.2]

Recognizing that Toyota's ultimate goal of a single national standard governing fuel economy and GHG's may not be practical under current law, we appreciate the efforts by the agencies to harmonize as much as possible the various provisions of NHTSA's CAFE standards and EPA's GHG standards. In particular, subject to specific comments provided later in this document, Toyota generally supports NHTSA's adoption of the following provisions in order to further harmonize with EPA's GHG regulations: (1) full-size hybrid pick-up truck credits; (2) A/C efficiency credits; and (3) off-cycle technology credits. [EPA-HQ-OAR-2010-0799-9586-A1, p.5]

Organization: U.S. Coalition for Advanced Diesel Cars

The Coalition expresses its support for federal policies that are aimed at increasing America’s twin goals of energy independence and reducing vehicle emissions. [NHTSA-2010-0131-0246-A1, p.1]

As stated throughout these comments, the Coalition is strongly in favor of the EPA and NHTSA’s twin objectives to increase America’s energy independence through better fuel economy and attempts to reduce GHG emissions from new vehicles. [NHTSA-2010-0131-0246-A1, p.8]

Organization: Union of Concerned Scientists (UCS)

On behalf of the Union of Concerned Scientists and our more than 350,000 supporters, please accept the attached technical comments regarding the proposed rule for 2017 and later model year light-duty vehicle greenhouse gas emissions and corporate average fuel economy standards. [EPA-HQ-OAR-2010-0799-9567-A2, letter p. 1]

UCS strongly supports the proposed standards, and applauds the work of the U.S. Environmental Protection Agency (EPA), the National Highway Traffic Safety Administration (NHTSA), and the California Air Resources Board (CARB) for their respective roles in the development of the proposed standards. [EPA-HQ-OAR-2010-0799-9567-A2, letter p. 1]

Your proposal represents historic progress, simultaneously helping tackle the threat of climate change, assisting the recovery of our domestic automotive industry, improving our nation's energy security, and strengthening the economy by saving consumers money at the pump. [EPA-HQ-OAR-2010-0799-9567-A2, letter p. 1]

Importantly, however, key provisions included in the proposal could erode these benefits, and should be addressed by the agencies before the standards are finalized. We provide further detail on these issues in our submitted comments. We urge the agencies to address these concerns and finalize strong vehicle standards for model years 2017-2025 by July 2012, consistent with the timeline issued in the most recent Notice of Intent. [EPA-HQ-OAR-2010-0799-9567-A2, letter p. 1]

Whether it is the threat of international terrorism, the devastating impacts of global climate change, or lost income and jobs due to oil price shocks, the damage caused by America's heavy reliance on oil is clear. Since transportation accounts for the majority of America's oil consumption, making our cars and light trucks cleaner and more fuel efficient is one of the most effective steps we can take to cut our reliance on oil, reduce the heat-trapping pollution that causes global warming, and put money back into the pockets of American consumers. [EPA-HQ-OAR-2010-0799-9567-A2, p. 1]

The proposed light-duty vehicle standards for model years (MYs) 2017-2025 represent a historic step forward. Combined with the existing standards for MYs 2012-2016, the proposed standards would nearly double the fuel efficiency and halve the greenhouse gas emissions of light duty vehicles sold in MY2025 compared to new vehicles sold today. This represents the most significant action ever taken by the federal government to cut America's oil dependence and curb global warming pollution. [EPA-HQ-OAR-2010-0799-9567-A2, p. 1]

Automakers have the technology to make all new light-duty vehicles cleaner and more fuel-efficient. The proposed standards would ensure that this technology is used to finally give consumers a real choice of fuel efficient vehicles – in the car, pickups minivan, and SUV segments alike – when they purchase a new vehicle. In addition, investing in new fuel-saving and pollution control technology will add value to vehicles and enhance the competitiveness of the U.S. auto industry. This will help continue the economic recovery of the American auto industry, protect existing jobs, and create new good-paying jobs into the future. [EPA-HQ-OAR-2010-0799-9567-A2, p. 1]

UCS applauds the important work of the U.S. Environmental Protection Agency (EPA), the National Highway Traffic Safety Administration (NHTSA), and the California Air Resources Board (CARB) for their respective roles in the development of the proposed standards. Throughout the regulatory process, the agencies have been transparent, relied heavily on independent technical analysis, and sought ongoing input from the public and other stakeholders. UCS urges the agencies to finalize strong vehicle standards, with attention paid to provisions in the proposal (noted in Section II below) that, if exploited by automakers, would reduce the program's anticipated benefits. [EPA-HQ-OAR-2010-0799-9567-A2, p. 1]

The agencies have proposed new light-duty vehicle standards for MYs 2017-2025, which would result in an anticipated fleetwide average greenhouse gas emissions level of 163 grams-per-mile and a fleetwide average CAFE level of 49.6 miles-per-gallon in MY2025. If finalized and fully implemented, these standards would deliver significant benefits to consumers, the domestic auto industry, the environment, and U.S. energy security. [EPA-HQ-OAR-2010-0799-9567-A2, p. 2]

The National Program Harmonizes Fuel Economy and Greenhouse Gas Standards while Maintaining California Authority

The proposed standards for MYs 2017-2025 build on the successful framework established originally in the rulemaking for fuel efficiency and greenhouse gas standards of MY2012-2016 vehicles. This National Program allows automakers to sell a single national fleet of new light-duty vehicles that comply with federal and state requirements under the Clean Air Act and the Corporate Average Fuel Economy (CAFE) program. Under this structure, EPA continues to set and administer national greenhouse gas standards under the Clean Air Act, while NHTSA sets and administers CAFE standards. Throughout this process, both EPA and NHTSA have coordinated with CARB, which will establish its own greenhouse gas standards, as allowed under the Clean Air Act. However, CARB has indicated that it will once again accept compliance with the National Program as compliance with its own program, based on conditions articulated in the letters of commitment signed in July 2011 and reiterated in the resolution language adopted by the Air Resources Board at their January 27th 2012 hearing.11, 12 [EPA-HQ-OAR-2010-0799-9567-A2, p. 4]

Since President Obama first directed the agencies to develop the second phase of the National Program in May 2010, both EPA and NHTSA have worked constructively to develop the proposed standards, based on rigorous technical analysis and public input. The agencies released a Notice of Intent (NOI) and supporting Technical Assessment Report (TAR) in September 2010. This was followed by a supplemental NOI in November 2010. Finally, the agencies released a second supplemental NOI in July 2011, and in November 2011 a robust Technical Support Document that accompanied the MY2017-2025 proposed rule. Throughout the process, both the public and key stakeholders were invited to submit comments to the agencies. In addition to the formal regulatory announcements, the agencies met routinely with key stakeholders, both individually and through stakeholder panels, throughout the regulatory process. UCS commends the agencies for conducting a thorough, transparent, and inclusive regulatory process to this point. [EPA-HQ-OAR-2010-0799-9567-A2, p. 4]

UCS applauds the agencies for proposing standards that represent historic progress for American consumers, the U.S. auto industry, clean air, and U.S. energy security. However, key provisions included in the proposal could erode these benefits, and should be addressed by the agencies before the standards are finalized. We provide further detail on these issues in the remaining portion of our comments. We urge the agencies to address these concerns and finalize strong standards for model years 2017-2025 by July 2012, consistent with the timeline issued in the most recent Notice of Intent. [EPA-HQ-OAR-2010-0799-9567-A2, p. 5]

As important and promising as the proposal is, there are several areas that should be improved to more accurately reflect current data and research on key issues, while other areas should be changed to avoid opportunities for automakers to exploit several provisions in the proposal. UCS encourages the agency to address these items before finalizing standards for model year 2017-2025 vehicles. [EPA-HQ-OAR-2010-0799-9567-A2, p. 5]

Again, UCS commends and thanks the agencies for their diligent work in developing the proposed MY2017-2025 standards. We look forward to the agencies addressing the issues noted above, and finalizing strong standards through 2025 by July 2012. [EPA-HQ-OAR-2010-0799-9567-A2, p. 14]

America's dangerous dependence on oil puts our environment, economy, and national security at risk. That's why I strongly support the proposed fuel efficiency and global warming emissions standards for new cars and light trucks sold in model years 2017-2025. [EPA-HQ-OAR-2010-0799-9713-A2, p. 2]

The proposed standards are achievable and reasonable and will save me money at the pump, cur millions of tons of harmful global warming emissions, and save as much oil in 2030 alone as we currently import from Saudi Arabia and Iraq. They will also drive innovation in the U.S. auto industry, creating new jobs across the country. [EPA-HQ-OAR-2010-0799-9713-A2, p. 2]

We cannot afford to delay in confronting the threats of climate change and our dangerous oil dependence. I urge you to move forward with the strongest possible standards free of harmful loopholes. [EPA-HQ-OAR-2010-0799-9713-A2, p. 2]

We support these efforts to reduce global warming emissions, improve the fuel efficiency of our vehicles, reduce our dependence on oil, and protect public health by ensuring drivers have more choices for clean cars and light trucks through the use of strong, cost-effective standards. [EPA-HQ-OAR-2010-0799-9713-A2, p. 3]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 214-220.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 137-140.]

---

11 http://www.epa.gov/otaq/climate/letters.htm

12 Final ARB resolution language had not been posted to ARB’s website at the time of submission.

38 Edmunds.com. 2010 Hyundai Elantra SE Features and Specs. Accessed January 5, 2011 online at http://www.edmunds.com/hyundai/elantra/2010/features-specs.html?sub=sedan&style=101197480

39 Vehicles that Meet or Exceed Proposed Targets With Current Powertrain Designs. Draft Joint Regulatory Impact Analysis, Table 3.12-1.

Organization: United Automobile Workers (UAW)

The UAW applauds NHTSA and EPA for their efforts in developing these proposed standards and urges the agencies to issue final regulations based on them. [EPA-HQ-OAR-2010-0799-9563-A2, p.1]

These proposed standards are NHTSA's proposal to implement the continuance of fuel economy standards in accordance with the Energy Independence and Security Act of 2007 (EISA) and EPA's proposal to continue the regulation of greenhouse gas emissions from light-duty vehicles under the Clean Air Act (CAA). [EPA-HQ-OAR-2010-0799-9563-A2, p.1]

The UAW commends both agencies and the Obama administration for putting forth proposals that extend and strengthen the unified national system of fuel economy and greenhouse gas emission regulation established for model years 2012-2016. These proposals provide needed regulatory certainty to the automobile industry by removing the threat of a confusing and costly patchwork of state and federal regulation of light-duty greenhouse gas emissions beginning in model year 2017. [EPA-HQ-OAR-2010-0799-9563-A2, p.1]

The proposed rules will benefit the nation by reducing greenhouse gas pollution and lessening the nation's dependence on foreign oil, while at the same time giving consumers relief from rising and volatile fuel prices and lowering the overall cost of owning and operating a light-duty vehicle. [EPA-HQ-OAR-2010-0799-9563-A2, p.1]

The UAW is pleased that the proposals recognize the complexities of the automobile market and the wide variety of products that consumers demand. These proposals call for improvements in fuel efficiency and reductions in tailpipe pollution that are fair, sensible and achievable across the many classes of cars and trucks sold in the United States. The proposed federal programs create a level playing field for manufacturers across the market. [EPA-HQ-OAR-2010-0799-9563-A2, pp.1-2]

In conclusion, the UAW is pleased to offer its strong support for the proposals put forward by NHTSA and EPA. We commend the Obama administration for its success in implementing the 2012-2016 rules and developing these proposed rules for 2017–2025 with an open process of stakeholder engagement. It is wise and efficient to gather as much information as possible from a wide variety of stakeholders before crafting proposed regulations, especially so when much of that information is deeply technical and closely held by the automakers. [EPA-HQ-OAR-2010-0799-9563-A2, p.7]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 21-26.]

It's an honor to be here this morning on behalf of our membership to voice UAW's full and strong support for the proposed rules, regulating greenhouse gas emissions and fuel economy.

The proposed rules are sensible, achievable and needed. They are good for the auto industry and its workers, good for the broader economy, good for the environment and good for our national security.

Also I want to say that UAW believes that the auto manufacturers, all the companies that participated in the technical discussions about these proposals and signed a letter of commitment to support its frameworks deserves tremendous credit for their commitment to dramatically increase the efficiency and reduce the emissions of vehicles sold in the United States.

This is a testament to good government. It shows how government can bring disparate stakeholders together to solve problems that are important to the American public. These proposed rules will reduce the pollution that contributes to climate change, significantly reduce America's dependence on foreign oil and save American families money at the pump. They will also create jobs in the auto industry and throughout the economy.

That's an incredible set of positive effects from these proposed rules, and it sums up why the United Auto Workers are in strong support of these proposals.

President Obama and his Administration, including the two agencies here today, did a tremendous job in developing the proposed rules. We thank the President for all the great work he has done to strengthen the American auto industry and automotive communities.

Organization: United States Senate

We are writing to express our support for your efforts to establish a coordinated national program for fuel economy and emissions standards for model year 2017 to 2025 cars, light trucks, and SUVs. The proposed regulations will increase nationwide fleetwide fuel economy to 54.5 miles per gallon by 2025. The standards will implement Federal law in a manner that provides industry with certainty, saves consumers billions of dollars at the pump, reduces our dependence on oil, and improves the health of American communities. [NHTSA-2010-0131-0264-A1, p.1]

These proposed regulations implement the policies set forth in the 2007 Ten in Ten Fuel Economy Act (Title I of Public Law 11 0-140) in a manner supported by many automotive manufacturers, as well as the labor and environmental community. Industry groups such as the National Association of Manufacturers praised the agreement on the proposed standards as a 'positive step.' The regulatory certainty created by this proposal, which unifies state and Federal regulations into a single regime, will help automakers to design and build advanced technology vehicles and compete in an increasingly global marketplace. [NHTSA-2010-0131-0264-A1, p.1]

We appreciate your efforts to achieve your statutory mandates of reducing oil use and pollution in a manner that will allow the automobile industry to grow and thrive. We encourage you to continue working with stakeholders to attain the critical national objectives of reduced pollution, improved energy security, and lower consumer gasoline costs while reducing compliance costs. [NHTSA-2010-0131-0264-A1, p.2]

Organization: United States Steel Corporation

U. S. Steel supports the objectives of the EPA and NHTSA to improve fuel economy and reduce the greenhouse gas emissions associated with light vehicles. U. S. Steel also supports the Energy Independence and Security Act (EISA) of 2007 and the President's May 21, 2010 request that EPA and NHTSA work together to develop a national program that would "…produce a new generation of clean vehicles" and responds to the country's goal of reducing carbon emissions and reducing oil consumption. [NHTSA-2010-0131-0256-A1, p. 1]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 207.]

Organization: United Steel Workers (USW)

The United Steelworkers strongly supports the Administration's goals to increase fuel efficiency standards for America's cars and trucks. Efficiency measures – whether they pertain to vehicles or industry – can have the dual benefit of achieving greenhouse gas emission reductions and making American businesses more globally competitive. We believe the vehicle emissions reduction and fuel economy improvement as proposed by this joint NHTSA/EPA document will serve both of these goals. [EPA-HQ-OAR-2010-0799-9580-A2, p.1]

Organization: Volkswagen Group of America

Following the establishment of the 2012-2016 National Program, Volkswagen continued to engage with agency staff to evaluate and discuss future potential for further improvements in light duty GHG emissions and fuel economy. [EPA-HQ-OAR-2010-0799-9569-A1, letter p. 1]

Volkswagen Group of America, Inc. (Volkswagen) supports the vision expressed by this rulemaking which is to continue into the 2017-2025 timeframe a harmonized National GHG and CAFE program. Volkswagen would like to acknowledge the effort made by EPA, NHTSA, and the State of California in building upon the previous 2012-2016 rulemaking. Volkswagen participated in the negotiations during the development of the previous National program and we have continued to meet with agency technical staff on a regular basis to provide updates regarding our input on future technology trends and efficiency improvements. We are appreciative of the opportunity to supply the agencies with these comments and we look forward to continued constructive dialogue. [EPA-HQ-OAR-2010-0799-9569-A1, p. 3]

Volkswagen elected not to endorse the Supplemental Notice of Intent (SNOI) released prior to this NPRM. We were encouraged that the proposal retains the framework for a single, national fuel economy program. However, we were concerned that the framework resulted in an unbalanced distribution of burden and that targeted flexibilities further amplified the inequities of the program. Volkswagen could not responsibly endorse a proposal that conflicted with our key principles stated above. [EPA-HQ-OAR-2010-0799-9569-A1, p. 6]

Volkswagen wishes to once again acknowledge the hard work and dedication by agency staff in crafting this proposal. Volkswagen appreciates the enormous complexity involved in evaluating future technology developments which attempt to balance the needs of diverse stakeholders. We are pleased to have the opportunity to provide these comments and look forward to continued technical dialogue with agency staff. [EPA-HQ-OAR-2010-0799-9569-A1, p. 29]

Organization: Volvo Car Corporation (VCC)

VCC supported the adoption of a single national program to address both greenhouse gases and fuel economy for model years 2012-2016 and commends the federal government for taking a leadership role in the evolution of these regulations. [EPA-HQ-OAR-2010-0799-9551-A2, p. 1]

VCC supports the effort of the Environmental Protection Agency (EPA), the National Highway Traffic Safety Administration (NHTSA) and the California Air Resources Board (CARB) to work towards the continuation of the single national program. This will allow the long-term development of a national program that enables a robust and realistic development process towards environmental vehicles which address greenhouse gases and fuel economy for the period 2017-2025. [EPA-HQ-OAR-2010-0799-9551-A2, p. 1]

The joint efforts of EPA and NHTSA to achieve harmonized requirements are essential to reach the overall objectives. [EPA-HQ-OAR-2010-0799-9551-A2, p. 4]

Application of Credits for Both GHG - EPA and CARB and CAFE-NHTSA

The proposed EPA and NHTSA requirements are coordinated, but not fully harmonized. They are also coordinated with CARB but are not completely harmonized. VCC suggests providing equivalent fuel consumption and CO_2 credit values toward both the GHG (EPA and CARB) and CAFE programs (NHTSA). [EPA-HQ-OAR-2010-0799-9551-A2, p.9]

The current economic situation limits the opportunities for financial incentives to deploy new environmental innovations. These constraints affect both industry and government opportunities and mean we must manage our available resources very carefully. [EPA-HQ-OAR-2010-0799-9551-A2, p. 15]

It is therefore a balancing act and extremely important that the mechanisms built into the EPA and NHTSA regulations are flexible. [EPA-HQ-OAR-2010-0799-9551-A2, p. 15]

Organization: Weiner, L.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 105.]

I'm here today to support proposed standards and grateful to EPA and NHTSA for putting this forth.

Organization: WESPAC Foundation

America's deepening dependence on oil puts our economy, environment, and national security at risk. I am writing to applaud you for taking an important step to confront the dangers of this dependence by proposing new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of the 54.5-mpg fleet-wide standard by 2025. [EPA-HQ-OAR-2010-0799-9459-A1, p.1]

The projected annual benefits of such standards by 2030 are enormous: [EPA-HQ-OAR-2010-0799-9459-A1, p.1]

$45 billion in savings at the gas pump [EPA-HQ-OAR-2010-0799-9459-A1, p.1]

23 billion gallons of gasoline saved [EPA-HQ-OAR-2010-0799-9459-A1, p.1]

280 million metric tons of global warming pollution avoided [EPA-HQ-OAR-2010-0799-9459-A1, p.1]

I applaud you for seizing this historic opportunity to do more than any previous administration to break America's dependence on oil, keep billions of dollars in our economy and reduce the threat of climate change. I urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rule-making process, in order to maximize their benefits for our economy, our environment and our national security. [EPA-HQ-OAR-2010-0799-9459-A1, p.1]

Organization: Whitefoot, K. and Skerlos, S.

This proposed rule takes important steps toward reducing oil consumption and greenhouse gas emissions. However, further measures are needed to ensure that the projected fuel economy improvements actually occur, and that incentives to upsize the vehicle fleet are reduced. [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

Response:

EPA acknowledges the general support for the proposed rule expressed by a very wide range of commenters. The commenters supported the proposal for many reasons, including the following: Appreciation of the effort to align the program with NHTSA's and CARB's programs; the aggressive but achievable standards that send a long-term signal to auto manufactures for their future planning; the expectation of significantly reduced CO_2 emissions and large fuel savings; expectation that the program will benefit businesses (including the auto industry), create jobs, benefit consumers, and spur innovation. EPA is maintaining all key provisions of the proposed rule that prompted these comments.

1.2. General Opposition for the National Program

Organizations Included in this Section

Adams, G.
Addam, Mary
Anonymous public citizen 4
Anonymous public citizen 5
Axford, H.
Bassett, S.
Cafagna, R.
Cuenca, M.
Defour Group
Ennis, M.
Environmental Consultants of Michigan
Faria, R.
Feinstein, C.
Gilles, B.
Gordon, Michael
Green, K.
Haroldson, C.
Hohenstein, H.
Horst, R.
Houston Tea Party Society
Institute for Energy Research (IER)
Jordon, A.
Knapp, B.
Kunz, R. and J.
Leach, Kyle
Lennon, S.
Links, W.
Lipetzky, P.
Medinger, R.
Mehrotra, Rahul
National Automobile Dealers Association (NADA)
Parker, M.
Paul, M.
Pearce, F.
Pregibon, D.
Rafter, M.
Shick, R.
Slemp III, R. L.
Statman, P.
Steffanoff, N.
Steyn, R.
Sullivan, T.
Van Voorhies, M.
Varley, R.

Organization: Adams, G.

I oppose the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, which will allow cars and light trucks to drive farther on a gallon of gas and reduce U.S. dependence on imported oil. [EPA-HQ-OAR-2010-0799-1550-A1, p. 1]

This spring, you set a goal of reducing oil imports by one-third this decade, and in November you proposed fuel efficiency standards that will effectively double current requirements. I question your efforts. I believe it is important to increase U.S. investment in sustainable energy technologies including fuel efficient technologies, charge consumers even more money with taxes at the pump, help this country break its dependence on foreign oil, and protect the environment. Don't let these standards be watered down--protect and finalize new fuel efficiency rules in all areas, not only in transportation. [EPA-HQ-OAR-2010-0799-1550-A1, p. 1]

Organization: Addam, Mary

In the face of peak oil and climate change, why are we waiting til 2017 for better fuel standards? It should have been done 40 years ago. [NHTSA-2010-0131-0208, p.1]

Organization: Anonymous public citizen 4

I read the letter written by several governors to support this proposal. California is not a wise choice to model ourselves after, a bankrupt state. I do not support this proposal. Add this on top of everything else we are burdened with and our economy will soon reach the point of no recovery. If the future of the automobile industry is restricted to building electric and hybrid vehicles, then I will probably be walking. [EPA-HQ-OAR-2010-0799-10317, p.1]

Organization: Anonymous public citizen 5

The general public does not want this bill, and it would be irresponsible to pass it. It should not be passed. [EPA-HQ-OAR-2010-0799-2010, p.1]

Organization: Axford, H.

Mr. President [sic] You leave My Choice of Vehicles Up to My Needs, And What I CAN AFFORD. You are destroying our economy by many of your actions. [EPA-HQ-OAR-2010-0799-9149-A1, p. 1]

Environmental Protection Agency should not increase the CAFE mandate. American families should decide which cars and light-trucks fit their needs and not have our choices dramatically limited by EPA. [EPA-HQ-OAR-2010-0799-9149-A1, p. 2]

These regulations are based on one simple assumption—that federal bureaucrats know better than American families what is best for us. This assumption is wrong. EPA does not know which cars are best for me and my family and should therefore not limit my choices through regulation. [EPA-HQ-OAR-2010-0799-9149-A1, p. 2]

When EPA claims that it has “designed proposed standards to preserve consumer choice” this is only true if you are rich. The rest of us will pay dearly. [EPA-HQ-OAR-2010-0799-9149-A1, p. 2]

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-9149-A1, p. 2]

Organization: Bassett, S.

I strongly do not support the proposed new fuel efficiency and greenhouse gas standards for cars and trucks to require cars and trucks to an average 54.5 miles per gallon by model year 2025. [EPA-HQ-OAR-2010-0799-8123-A1, p. 1]

Organization: Cafagna, R.

Environmental Protection Agency should not increase the CAFE mandate. American families should decide which cars and light-trucks fit their needs and not have our choices dramatically limited by EPA. [EPA-HQ-OAR-2010-0799-11689-A1, p. 1]

These regulations are based on one simple assumption—that federal bureaucrats know better than American families what is best for us. This assumption is wrong. EPA does not know which cars are best for me and my family and should therefore not limit my choices through regulation. [EPA-HQ-OAR-2010-0799-11689-A1, p. 1]

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-11689-A1, p. 2]

Organization: Cuenca, M.

The Environmental Protection Agency should NOT increase the CAFE mandate. American families should decide which vehicles fit their needs and not have our choices limited by the EPA. [EPA-HQ-OAR-2010-0799-10142-A1, p. 1]

These regulations are based on a single assumption.....federal bureaucrats know better than American families what is best for us. This assumption is wrong. The EPA does NOT know which cars are best for me and my family therefore, should not limit my choices through regulation! [EPA-HQ-OAR-2010-0799-10142-A1, p. 1]

When the EPA claims it has “designed proposed standards to preserve consumer choice” this is only true if you are rich. The rest of us will pay dearly. [EPA-HQ-OAR-2010-0799-10142-A1, p. 2]

The EPA should allow people to make vehicle choices for themselves, based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-10142-A1, p. 2]

Organization: Defour Group

Regarding climate change and CAFE, President Carter's former White House economic advisor on energy policy, William Nordhaus of Yale concludes:

The measure of whether someone is serious about tackling the global warming problem can be readily gauged by listening to what they say about the carbon price. Suppose you hear a public figure who speaks eloquently of the perils of global warming and proposes that the nation should move urgently to slow climate change. Suppose that person proposes regulating the fuel efficiency of cars, or requiring high-efficiency light bulbs, or subsidizing ethanol, or providing research for solar power – but nowhere mentions the need to raise the price of carbon. You should conclude that the proposal is not serious and does not recognize the central economic message about how to slow climate change. To a first approximation, raising the price of carbon is a necessary and sufficient step for tackling global warming. The rest is largely fluff.19 [EPA-HQ-OAR-2010-0799-9319-A1, p. 12]

Organization: Ennis, M.

I strongly oppose these standards.

We cannot afford any of these absurd idea's. [EPA-HQ-OAR-2010-0799-5612-A1, p. 1]

Organization: Environmental Consultants of Michigan

Agency Was Arbitrary and Capricious In the Selection of Policy

The Agency's stated goal is to achieve important reductions in greenhouse gas emissions and fuel consumption from the light-duty vehicle part of the transportation sector claiming that the affected vehicles contribute substantially to greenhouse gas emissions (GHG) and petroleum fuel usage. Since 2002, the Agency has set a goal of carbon neutrality. With this goal in mind, the Agency has the obligation to conduct a fair and balanced evaluation of policy options to achieve this goal. [NHTSA-2010-0131-0166-A1, p. 1]

CAFÉ Has Been a Policy Failure [NHTSA-2010-0131-0166-A1, p. 1]

We now have over thirty years of history to determine the viability of continuing the use of CAFÉ (or its EPA equivalent tailpipe greenhouse gas standards) as a policy tool. In evaluating the official government CAFÉ data1 we find that three of the nine highest volume manufacturers2, Honda, Nissan and Mercedes Benz have DECREASED their combined car and truck fleet average CAFÉ since 1980. Although the Korean based companies were not in the market in 1980, they have reduced their CAFÉ since entering the market in 1986. This can hardly be considered a successful policy when fully half the major participants have actually backslid on CAFÉ over thirty years. [NHTSA-2010-0131-0166-A1, pp. 1-2]

It is impossible to conclude that CAFÉ has been a successful national policy.

- Japanese based companies have increased their CAFÉ performance by only 2 mpg in the past 30 years (Figure 12) [Figure 12 can be found on p. 19 of Docket number NHTSA-2010-0131-0166-A1]

  o Sales increased by a factor of 2.4

- European based companies have DECREASED their CAFÉ performance by almost a mile per gallon (0.9 mpg) in the past 30 years (Figure 13) [Figure 13 can be found on p. 20 of Docket number NHTSA-2010-0131-0166-A1]

  o Sales have been essentially flat

- Korean based companies have DECREASED their CAFÉ performance by one mile per gallon since they entered the US market in 1986 (Figure 14) [Figure 14 can be found on p. 21 of Docket number NHTSA-2010-0131-0166-A1]

  o Sales increased by a factor of 4

- The 3 remaining domestic companies have increased their CAFÉ performance by about 5 mpg (4.8 mpg) in the past 30 years (Figure 15) [Figure 15 can be found on p. 22 of Docket number NHTSA-2010-0131-0166-A1]

  o Sales decreased by almost half

- The limited success in increasing fuel economy over the past thirty years was the result of fuel price swings (Figure 16) and shifting sales from domestic manufacturers to Asian based companies. [Figure 16 can be found on p. 23 of Docket number NHTSA-2010-0131-0166-A1] [NHTSA-2010-0131-0166-A1, p. 2]

In looking at the domestic industry, history shows that there were 5 domestic based companies in 1980;

- American Motors went bankrupt (only the Jeep brand survived);
- International Harvester (now Navistar) left the segment;
- Chrysler required two federal bailouts and one bankruptcy filing;
- General Motors required one federal bailout and one bankruptcy filing [NHTSA-2010-0131-0166-A1, p. 2]

Given this history and a complete lack of regional progress it is impossible to conclude that CAFÉ has been a successful national policy. [NHTSA-2010-0131-0166-A1, p. 2]

Conclusion

These proposed standards are unfair to environmentalists, to manufacturers and to consumers. Instead of wasting another thirty plus years on CAFÉ and its duplicative tailpipe counterpart, the Federal government has no choice but to scrap this proposal and eliminate the existing tailpipe greenhouse gas standards. EPA should immediately begin work on a National low carbon fuel standard. [NHTSA-2010-0131-0166-A1, p. 8]

1 October 2011 Summary of Fuel Economy Performance – October 28, 2011; U. S. Department of Transportation; NHTSA, NVS-220

2 These companies represent over 93% of US sales

Organization: Faria, R.

Environmental Protection Agency must not increase the CAFE mandate. American families will decide which cars and light-trucks fit their needs and not have our choices dramatically limited by EPA. [EPA-HQ-OAR-2010-0799-9834-A1, p. 1]

These regulations are based on one simple assumption—that federal bureaucrats know better than American families what is best for Americans. This assumption is wrong. EPA does not know which cars are best for me and my family and will therefore not limit my choices through regulation. The EPA must be disbanded...!!! [EPA-HQ-OAR-2010-0799-9834-A1, p. 1]

When EPA claims that it has “designed proposed standards to preserve consumer choice”, it simply means that they wish to expand their size and control over the American people. Disband the EPA now...!!! [EPA-HQ-OAR-2010-0799-9834-A1, p. 2]

I will not allow the EPA to make my car choices. The EPA only wishes to impose more mandates from Washington, D.C. thereby increasing their size and control over Americans. [EPA-HQ-OAR-2010-0799-9834-A1, p. 2]

Organization: Feinstein, C.

I do not support the proposed standards. [EPA-HQ-OAR-2010-0799-6745-A1, p. 1]

Organization: Gilles, B.

I strongly oppose the proposed new fuel efficiency and greenhouse gas standards for cars and trucks to require cars and trucks to an average 54.5 miles per gallon by model year 2025. [EPA-HQ-OAR-2010-0799-8065-A1, p. 1]

Organization: Gordon, Michael

I oppose these regulations. There is no evidence whatsoever that greenhouse gas emissions harm the environment and thus this regulation is not necessary. [EPA-HQ-OAR-2010-0799-9625, p.1]

Organization: Green, K.

I question the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, which will allow cars and light trucks to drive farther on a gallon of gas and reduce U.S. dependence on imported oil. [EPA-HQ-OAR-2010-0799-1524-A1, p. 1]

This spring, you set a goal of reducing oil imports by one-third this decade, and in November you proposed fuel efficiency standards that will effectively double current requirements (for fuel efficiency?). I question your efforts. While I agree that it is important to increase U.S. investment in fuel efficient technologies, save consumers money at the pump, help this country break its dependence on foreign oil, and protect the environment. [EPA-HQ-OAR-2010-0799-1524-A1, p. 1]

Setting standards that are impossible to meet does nothing to help American consumers; nor does it ensure future energy independence for the country. [EPA-HQ-OAR-2010-0799-1524-A1, p. 1]

Organization: Haroldson, C.

I am writing in OPPOSITION of the strong fuel-efficiency and carbon pollution standards for new cars and trucks. [EPA-HQ-OAR-2010-0799-11137-A1, p. 1]

Organization: Hohenstein, H.

I do NOT support the proposed rule to increase fuel economy for new passenger vehicles.

I do not believe - I think it is important to increase private U.S. investment in fuel efficient technologies, save consumers money at the pump, help this country drill more crude in America and become less dependence on foreign oil. Consequently our environment will improve. Do NOT let these standards be mandated on the American people. They have lost enough freedom.

Organization: Horst, R.

I'm strongly opposed the any governmental agency regulating fuel mileage standards under the guise of clean air! [EPA-HQ-OAR-2010-0799-6353-A1, p. 1]

Organization: Houston Tea Party Society

My name is Neal Meyer and I am a member of the Houston Tea Party Society, a Tea Party group with some 3,500 members. My comment is in regards to the U.S. EPA rule mandate that motor vehicles must achieve greater fuel economy standards. [EPA-HQ-OAR-2010-0799-9583, p. 1]

My belief, and I believe I am speaking for many, is that the U.S. government should not be setting fuel economy standards for motor vehicles. The price of crude oil has gone up from $20 per barrel back in 2000, to $100 per barrel in 2012, with the price of gasoline having gone up from $1.00 per gallon to $3.50 - $4.00 per gallon during the year 2000 - 2012 time frame. There is evidence that this increase in fuel prices has caused Americans to decide to drive fewer vehicle miles and to start buying motor vehicles that get better fuel economy on their own, without the requirement of a mandate from the federal government. It is this sort of meddling, where the federal government substitutes its judgment for those of Americans, that has angered many Americans. [EPA-HQ-OAR-2010-0799-9583, p. 1]

So, in conclusion, on behalf of the Houston Tea Party Society, I would say to the U.S. EPA to no not enact, adopt, or enforce this rule. [EPA-HQ-OAR-2010-0799-9583, p. 1]

Organization: Institute for Energy Research (IER)

Lastly, EPA is legally required to consider less restrictive alternatives to achieve their goals of greenhouse gas emission reductions from motor vehicles. EPA does not conduct this analysis in this proposed rule.[EPA-HQ-OAR-2010-0799-9573-A1, p. 2]

For these reasons, EPA should not regulate greenhouse gases from vehicles using the Clean Air Act. [EPA-HQ-OAR-2010-0799-9573-A1, p. 2]

Another problem is that the EPA's analysis doesn't ask whether the proposed rules would reduce greenhouse gas emissions in the most efficient manner. In the economics of climate change literature, it theoretically improves social welfare if governments around the world jointly implement a uniform carbon tax equal to the estimated Social Cost of Carbon. The higher price on carbon emissions leads to reductions by precisely those emitters that are most able to afford it. As a result, this "market-based" (though the term is somewhat of a misnomer since it results from government tax policy) approach to fighting climate change would achieve the correct reduction in total emissions in the least-cost manner. [EPA-HQ-OAR-2010-0799-9573-A1, p. 22]

In this theoretically optimal scenario, it is very improbable that the worldwide response to the new carbon tax regime would consist of U.S. manufacturers sharply increasing the fuel efficiency of light duty cars and trucks. There are other, cheaper ways of reducing carbon emissions by a desired quantity. By eschewing "market-based" approaches and directly ordering the particular form of emission reductions—namely by increasing the fuel efficiency of new vehicles in certain classes by specific amounts by specific deadlines—the proposed rules are economically inefficient, relative to other possible policies. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 22-23]

Organization: Jordon, A.

President Obama stop limiting our automobile choices [EPA-HQ-OAR-2010-0799-9857-A1, p. 1]

Get Government OUT of my life and BUSINESS [EPA-HQ-OAR-2010-0799-9857-A1, p. 1]

Organization: Knapp, B.

I strongly OPPOSE the proposed new fuel efficiency and greenhouse gas standards for cars and trucks to require cars and trucks to an average 54.5 miles per gallon by model year 2025. [EPA-HQ-OAR-2010-0799-8255-A1, p. 1]

Organization: Kunz, R. and J.

Environmental Protection Agency should not increase the CAFE mandate. American families should decide which cars and light-trucks fit their needs and not have our choices dramatically limited by EPA. [EPA-HQ-OAR-2010-0799-9562-A1, p. 1]

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-9562-A1, p. 1]

Organization: Leach, Kyle

I think this rules are too long and basically suck. We will all be driving stupid prius like cars. This is AMERICA dang it. [EPA-HQ-OAR-2010-0799-9626, p.1]

Organization: Lennon, S.

Environmental Protection Agency should not increase the CAFE mandate. American families should decide which cars and light-trucks fit their needs and not have our choices dramatically limited by EPA. [EPA-HQ-OAR-2010-0799-9019-A1, p. 1]

When EPA claims that it has “designed proposed standards to preserve consumer choice” this is only true if you are rich. The rest of us will pay dearly. [EPA-HQ-OAR-2010-0799-9019-A1, p. 1]

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-9019-A1, p. 1]

Organization: Links, W.

Environmental Protection Agency should not increase the CAFE mandate. American families should decide which cars and light-trucks fit their needs and not have our choices dramatically limited by EPA.

These regulations are based on one simple assumption—that federal bureaucrats know better than American families what is best for us. This assumption is wrong. EPA does not know which cars are best for me and my family and should therefore not limit my choices through regulation. [EPA-HQ-OAR-2010-0799-10348-A1, p. 1]

When EPA claims that it has “designed proposed standards to preserve consumer choice” this is only true if you are rich. The rest of us will pay dearly.

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. President Obama and all you bureaucrats who need to just back off on telling us what type of vehicles we should drive. you have no idea.

Organization: Lipetzky, P.

I NOT support the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, which will allow cars and light trucks to drive farther on a gallon of gas and reduce U.S. dependence on imported oil. [EPA-HQ-OAR-2010-0799-8184-A1, p. 1]

Organization: Medinger, R.

Stop all your government 'Big Brother' snooping and intervention. We are really smart enough to live our own lives without your socialist agenda. [EPA-HQ-OAR-2010-0799-9035-A1, p. 1]

Organization: Mehrotra, Rahul

I believe these efforts are too little, too late.

We have already scorched our planet beyond the tipping point.

It may help if this standard was made effective right away, with punitive damages for delays. [NHTSA-2010-0131-0206, p.1]

Your leadership and initiative in this matter needs to be dictated by the mess we have caused, and not the conveniences of those who have created the mess.

After all, we are only asking to get back to where we were. [NHTSA-2010-0131-0206, p.1]

Organization: National Automobile Dealers Association (NADA)

Yet, the proposal continues to ignore this direction, opting instead for a bureaucratic cobbling together of NHTSA’s CAFE standards with EPA’s largely redundant GHG standards. [EPA-HQ-OAR-2010-0799-9575-A1, p. 12]

The time-honored EPA test procedures used to calculate NHTSA’s CAFE standards rely on equations involving a carbon balance technique where fuel economy is calculated from the measurement of exhaust emissions, and an assumption that the quantity of carbon in a vehicle's exhaust gas is equal to the quantity of carbon consumed by the engine as fuel. The physics and chemistry involved spell a direct relationship; controlling fuel economy controls GHGs and controlling GHGs controls fuel economy. NADA continues to believe that any further rulemakings in this area should involve NHTSA CAFE standards, supplemented by a few appropriately tailored EPA rules governing motor vehicle air conditioning, fuels, and vehicle use. Moreover, EPA should focus its resources on 'doing no harm,' such as by ensuring that its emissions standards, including potential Tier III standards, avoid conflicting with mandates aimed at achieving fuel economy improvements. Indeed, this is yet another lesson learned from the commercial truck experience where the emissions mandates at issue served to severely undermine fuel economy performance. [EPA-HQ-OAR-2010-0799-9575-A1, p. 12]

Lastly, NADA continues to strongly object to the needless deference being given to the California Air Resources Board and to its unnecessary and arguably preempted fuel economy rules. NHTSA and EPA should take the policy position that the issuance of a final national rule should eliminate, once and for all, any basis for the state regulation of fuel economy. NADA strongly suggests that EPCA's explicit preemption of the adoption or enforcement of state laws 'related to' fuel economy was necessary to ensure national uniformity and to avoid a patchwork of state-by-state mandates that would conflict a 'National Program,' and undermine the safety, job loss, equity, and consumer affordability and choice considerations required by EPCA. [EPA-HQ-OAR-2010-0799-9575-A1, pp. 12-13]

Organization: Parker, M.

Environmental Protection Agency should not increase the CAFE mandate. American families should decide which cars and light-trucks fit their needs and not have our choices dramatically limited by EPA. [EPA-HQ-OAR-2010-0799-9017-A1, p. 2]

These regulations are based on one simple assumption—that federal bureaucrats know better than American families what is best for us. This assumption is wrong. EPA does not know which cars are best for me and my family and should therefore not limit my choices through regulation. [EPA-HQ-OAR-2010-0799-9017-A1, p. 2]

When EPA claims that it has “designed proposed standards to preserve consumer choice” this is only true if you are rich. The rest of us will pay dearly. [EPA-HQ-OAR-2010-0799-9017-A1, p. 2]

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-9017-A1, p. 2]

Get the overreaching theiving goverment out of the American peoples lives. The last thing this country needs is more regulation. You don't enforce the laws we do have so stop making ridiculous new ones. This Republic government that has been over taken by democacy (a failing government) is failing. The depts that have been set up such as the dept of energy has failed and you can't fix it. You are destroying the very freedoms and even the illusion of freedom we still have. Government is not the solution, the Constitution is; Freedom and Liberty. The only thing that you are succeeding at is destroying this country, but that has been your malicious intent all along. [EPA-HQ-OAR-2010-0799-9017-A1, p. 2]

Organization: Paul, M.

Environmental Protection Agency (EPA) should ••NOT•• increase the Corporate Average Fuel Economy (CAFE) mandates. AMERICAN FAMILIES should be able to decide which cars and light-trucks fit their needs and ••NOT•• HAVE OUR CHOICES DRAMATICALLY LIMITED... BY THE EPA. [EPA-HQ-OAR-2010-0799-9027-A1, p. 2]

Increased CAFE mandates are based on one simple ASSUMPTION—that federal bureaucrats 'know better' than American families what is best for us. THIS ASSUMPTION IS WRONG.. EPA does ••NOT•• know which cars are best for me and my family AND should therefore ••NOT•• limit my choices through regulation. [EPA-HQ-OAR-2010-0799-9027-A1, p. 2]

When EPA claims that it has “designed proposed standards to PRESERVE CONSUMER CHOICE”... WHAT 'HOGWASH'!!!. IN FACT, THIS REGULATION WOULD IN FACT, ELIMINATE CHOOSING A CAR THAT DIDN'T MEET THE CAFE MANDATE AND... RAISE THE COSTS ON ALL VEHICLES...,THUS ••ELIMINATING•• CONSUMER CHOICE, [EPA-HQ-OAR-2010-0799-9027-A1, p. 2]

IT IS THEREFORE ••ANOTHER USELESS REGULATION•• ATTEMPTING TO FURTHER CONTROL... THE AMERICAN PUBLIC, THE ECONOMY, AND... IT WILL ONLY HAVE NEGATIVE IMPACTS ON OUR COUNTRY. [EPA-HQ-OAR-2010-0799-9027-A1, pp. 2-3]

Organization: Pearce, F.

Environmental Protection Agency should not increase the CAFE mandate. American families should decide which cars and light-trucks fit their needs. It is unreasonable and against the best interests of our nation to have choices limited by the EPA.

It appears that you assume federal bureaucrats know better than American families what is best for us. This assumption is wrong. EPA does not know which cars are best for me and my family and must not limit my choices through such regulation. [EPA-HQ-OAR-2010-0799-10343-A1, p.1]

EPA should allow people to make car choices for ourselves based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-10343-A1, p. 1]

Thank you for rescinding this unnecessary burden on the American people. [EPA-HQ-OAR-2010-0799-10343-A1, p. 1]

Organization: Pregibon, D.

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-8987-A1, p. 1]

Organization: Rafter, M.

I am writing to oppose the absurd fuel-efficiency and carbon pollution standards for new cars and trucks. [EPA-HQ-OAR-2010-0799-11587-A1, p. 1]

Organization: Shick, R.

On behalf of U.S. consumers everywhere and as a 24 year automotive industry veteran, I am writing to express my profound opposition to the new CAFE requirements proposed by the Obama administration. [EPA-HQ-OAR-2010-0799-6215-A1, p. 1]

Please do not approve the proposed CAFE regulations in the best interests of the U.S. consumer. [EPA-HQ-OAR-2010-0799-6215-A1, p. 1]

Organization: Slemp III, R. L.

I am NOT in favor of the proposed fuel economy standards. [EPA-HQ-OAR-2010-0799-6314-A1, p. 1]

Organization: Statman, P.

We are so far beyond the (infernal) primitive internal combustion engine of the 18th Century. Why are we still burning fossil fuels? This is a joke, right? 54mpg by 2025?

How about 0 emissions by 2013? We know the technology is affordably available.

You won't do it, but it was good to write this down for you to ignore. [EPA-HQ-OAR-2010-0799-1472-A1, p. 1]

Organization: Steffanoff, N.

If the Government is really concerned about air pollution and consuming petroleum resources then the Federal Government needs to consider the energy cost in the manufacture of any car/vehicle. In essence we would be better off, collectively, amortizing the energy cost of manufacture of vehicles over the longest time period possible. People who are willing to drive older cars (20 years old or older) should be 'rewarded' by relaxing the air pollution standards on these older cars to encourage their being driven as long as possible to amortize the energy cost of their manufacture as far into the future as possible. [EPA-HQ-OAR-2010-0799-9335-A1, pp. 1-2]

The Environmental Protection Agency should NOT increase the CAFE mandate. American families should decide which cars and light-trucks fit their needs and not have our choices dramatically limited by EPA. [EPA-HQ-OAR-2010-0799-9335-A1, p. 2]

These regulations are based on one simple assumption—that federal bureaucrats know better than American families what is best for us. This assumption is wrong. EPA does not know which cars are best for me and my family and should therefore not limit my choices through regulation. [EPA-HQ-OAR-2010-0799-9335-A1, p. 2]

When EPA claims that it has “designed proposed standards to preserve consumer choice” this is only true if you are rich. The rest of us will pay dearly. [EPA-HQ-OAR-2010-0799-9335-A1, p. 2]

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. [EPA-HQ-OAR-2010-0799-9335-A1, p. 2]

Organization: Steyn, R.

I vehemently oppose the Environmental Protection Agency’s proposal to increase the CAFE standards for the following reasons: [EPA-HQ-OAR-2010-0799-8724-A1, p. 2]

* American families should decide which cars and light-trucks fit their needs and not have our choices dramatically limited by the EPA or any other government bureaucracy. That is called FREEDOM, which the Obama administration and its bureaucratic minions are intentionally and rapidly stripping from the American people. [EPA-HQ-OAR-2010-0799-8724-A1, p. 2]

Organization: Sullivan, T.

Environmental Protection Agency should not increase the CAFE mandate. American families should decide which cars and light trucks fit their needs. We should not have our choices dramatically limited by EPA or any government agency. [EPA-HQ-OAR-2010-0799-10341-A1, p. 1]

These regulations are based on one simple assumption - that federal bureaucrats know better than American families what is best for us. This assumption is wrong. EPA does not know which cars are best for me and my family and should therefore not limit my choices through regulation. [EPA-HQ-OAR-2010-0799-10341-A1, pp. 1-2]

When EPA claims that it has “designed proposed standards to preserve consumer choice” this is only true if you are rich. The rest of us will pay dearly. The EPA is not being truthful. [EPA-HQ-OAR-2010-0799-10341-A1, p. 2]

EPA should allow people to make our car choices for themselves based on our needs instead of imposing more mandates from Washington, D.C. Stop ruining our economy trying to satisfy the false theory of global warming. [EPA-HQ-OAR-2010-0799-10341-A1, p. 2]

Organization: Van Voorhies, M.

I DO NOT SUPPORT THIS PROPOSAL. [EPA-HQ-OAR-2010-0799-1629-A1, p. 1]

Organization: Varley, R.

I have great concern that this is asking far far too little. It seems ridiculous to me that it should take 28 years (from 1997 to 2025) to do less than double that mileage. It needs to be done much faster than this. I hope that by then we will not be using petroleum gas at all. [EPA-HQ-OAR-2010-0799-1948-A1, p. 1]

Response:

EPA acknowledges several general comments opposing the proposed program. A few of these commenters expressed that the program should be more stringent and be implemented sooner. Issues of stringency and timing are addressed in RTC Section 2.2 below.

Most commenters opposing the program express a general belief that the proposed rule is unnecessary, in some cases stating that market forces would be sufficient to achieve the environmental, fuel savings, and energy security goals of the program. These comments are strongly controverted by historic evidence. As discussed in preamble section III.D.1.a, fuel economy improvements have historically remained unchanged in periods of flat CAFE standards -- absent price spikes in automotive fuels. These historic trends, coupled with the AEO2011 projection of largely stable gasoline prices through MY 2025, strongly support EPA's conclusion that market forces alone will not result in the improvements projected for the rule. All the written public comments on this issue strongly supported EPA's analysis. See preamble section III.D.1.a. In addition, since the MYs 2012-2016 standards are footprint-based, every major manufacturer is expected to be constrained by the new standards in 2016, and manufacturers of small vehicles will not routinely over-comply as they had with the past universal CAFE standards. There are additional factors that reinforce the historical evidence. While it is possible that one or two companies may over-comply, any voluntary over-compliance by one company would generate credits that could be sold to other companies to substitute for their more expensive compliance technologies. This ability to buy and sell credits could eliminate any over-compliance for the overall fleet, absent the GHG rule. Throughout the preamble, technical documents, and this Response to Comments document, EPA presents its broad analytical rationale for the program and will finalize all the major aspects of the proposed rulemaking.

A number of commenters expressed the belief that the proposed program would limit the vehicle choices available to consumers. This is not the case. As discussed in more detail in the preamble and in other comment responses, the footprint attribute-based standard tends to force improvement across the entire spectrum of vehicle footprints and reduces incentive to downsize vehicles as a compliance strategy. In addition, the agencies have included costs of preserving all vehicle utility found in the present fleet (see e.g. EPA RIA at p. 1-40), and demonstrated feasible, cost-effective compliance paths to meet the standards without eliminating any utility found in the present fleet. Consequently, any changes in types of vehicle offered for sale would be a result of market forces and manufacturer responses thereto, but would not be a direct consequence of this rule. EPA addresses impacts on consumers, including vehicle choice issues, in Section 18.1 below.

One commenter stated that because past CAFE standards had not resulted in significant improvements in fuel economy, EPA and NHTSA should not pursue new GHG and CAFE standards. On the contrary, EPA has shown in the earlier GHG rulemaking and in this one that new, stringent CAFE and GHG standards can be expected to result in large reductions in emissions and in fuel consumption in the coming years, precisely because they are more stringent than earlier standards, as described in Section 16.1 below. Also in Section 16.1, EPA addresses the need for GHG reductions.

With respect to comments from the Defour Group and Institute for Energy Research, we note that the merits of carbon pricing schemes are outside the scope of this rule. EPA has taken a common-sense approach to developing standards for greenhouse gas emissions from mobile sources under the Clean Air Act. These actions have focused on reducing greenhouse gas emissions by increasing the efficiency of cars and trucks. EPA's analyses show that these regulations will save consumers money at the pump, improve energy security by reducing oil consumption, and cut millions of tons of harmful greenhouse gas emissions.

2. CO_2 Emissions Standards

2.1. Attribute-based (footprint) approach

Organizations Included in this Section

Alliance of Automobile Manufacturers
Aluminum Association's Aluminum Transportation Group
BMW of North America, LLC
Consumer Federation of America (CFA)
Consumer Reports
Ecology Center
Ferrari
Ford Motor Company
General Motors Company
Institute for Policy Integrity, New York University School of Law
Insurance Institute for Highway Safety (IIHS)
International Council on Clean Transportation (ICCT)
Mercedes-Benz USA, LLC
National Automobile Dealers Association (NADA)
Society of the Plastics Industry, Inc. (SPI)
United Automobile Workers (UAW)

Organization: Alliance of Automobile Manufacturers

Continued Use of Footprint Attribute [EPA-HQ-OAR-2010-0799-9487-A1, p.85]

The Alliance agrees that footprint is integral to a vehicle's design and is dictated by the vehicle platform, which is typically used for a multi-year model life cycle. As such, it continues to be a reasonable choice for setting standards. Further, since footprint was the basis for all regulatory discussions, it remains the appropriate attribute. [EPA-HQ-OAR-2010-0799-9487-A1, p.85]

Analysis of manufacturer data and understanding of the vehicle energy efficiency dependence on footprint suggests that linear attribute curves based on gym (gallons per mile) versus footprint is an appropriate way to adjust for size differences across the industry. Vehicle efficiency is driven by road load, mass, and powertrain/driveline efficiency. Regressions of vehicle road load energy over EPA driving cycles, frontal area and mass show strong linear relationships with footprint. [EPA-HQ-OAR-2010-0799-9487-A1, p.85]

Weighting and Regression Analysis [EPA-HQ-OAR-2010-0799-9487-A1, p.86]

The Alliance also supports the weighting and regression analysis used to develop the 2017-2021 model year CAFE and GHG curves. We further support the derived relationships between the vehicles' CO_2/fuel consumption and their related footprints as an appropriate attribute. However, as mentioned elsewhere in our comments, these weightings and analysis should be reviewed during the midterm evaluation for the MY 2022-2025 model years. [EPA-HQ-OAR-2010-0799-9487-A1, p.86]

Organization: BMW of North America, LLC

BMW fully supports the continued use an attribute-based program. [EPA-HQ-OAR-2010-0799-9579-A1, p. 1]

With respect to a Single National Program, BMW fully supports the continued use an attribute-based program for passenger cars and light trucks as proposed by EPA and NHTSA. Compared to a uniform standard for passenger cars and light trucks, an attribute-based standard drives fuel efficiency and GHG reduction in all segments while taking into account the manufacturer's product portfolio. However, because BMW offers a worldwide product portfolio and most of the CO_2 and fuel economy regulations worldwide are based on vehicle weight instead of footprint, BMW continues to recommend that these regulations be harmonized as much as possible. [EPA-HQ-OAR-2010-0799-9579-A1, p. 3]

Organization: Consumer Federation of America (CFA)

The attribute-based approach ensures that the standards do not require radical changes in the types or size of vehicles consumers drive; so, the full range of choices will be available to consumers. [EPA-HQ-OAR-2010-0799-9419-A1, p. 8]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 90.]

Third, the approach to setting standards is consumer friendly and facilitates auto maker compliance.

The new attribute-based approach as you've heard provides no incentive to change the size of the vehicles. Consumers will get the cars they want; they'll all be more fuel efficient.

Organization: Consumer Reports

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 168.]

Because the CAFE standards are now footprint-based, improvements across all vehicle sizes, so each class will see an efficiency.

Organization: Ecology Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 188.]

One is that the proposed standards continue the attribute-based structure and requirements for steady improvement that were established in the current standards. When first proposed by the agencies in 2009 following the historic 2007 Energy Independence and Security Act, this new approach represented a breakthrough in regulation for this sector. Not only were the requirements more fairly applied among vehicle manufacturers but the rules also more effectively stimulated innovation by requiring improvements across all vehicle sizes and classes. The rules also included provisions that help ensure the continued production of domestic fuel-efficient vehicles, and we support those as well.

Organization: Ferrari

1) Vehicle attributes to be considered [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

We agree that the CO_2 and CAFE standards are based on one or more vehicle attributes. The footprint is the attribute selected first by NHTSA since 2011 MY CAFE regulation and then in the joint National Program MYs 2012-16 for both CO_2 and CAFE standards. [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

The footprint alone does not take into account many of a vehicles' other characteristics that greatly affect the fuel economy/ CO_2 emissions, like the engine displacement and power, transmission, curb weight, aerodynamics, etc. This fact is recognized by both EPA and NHTSA, as written in Section II.C.2. (pages 74912 and 74913): [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

There are several policy and technical reasons why NHTSA and EPA believe that footprint is the most appropriate attribute on which to base the standards, even though some other vehicle attributes (notably curb weight) are better correlated to fuel economy and emissions. [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

Further…we recognize that weight is better correlated with fuel economy and CO_2 emissions than is footprint. [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

We sent our comments on this important issue in the previous rulemaking for MYs 2012- 16. We would prefer at least a second attribute to be considered, in addition to the footprint. For example: the power to curb weight ratio. Nonetheless, we admit that it seems logical to continue with the footprint, as proposed, to be consistent with the final regulation enacted for MYs 2012-16. [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

We agree to keep the type and shape of curves that define CO_2 and fuel economy standards. [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

Organization: Ford Motor Company

Ford supports the continuation of footprint-based standards with separate car and truck fleets based on NHTSA vehicle definitions for both the GHG and CAFE programs. [EPA-HQ-OAR-2010-0799-9463-A1, p. 8]

Ford and the auto industry have long supported separate car and truck attribute-based standards because cars and trucks have different functional characteristics, even if they have the same footprint and nearly the same base curb weights. For example, the Ford Edge and the Ford Taurus have the same footprint, but vastly different capabilities with respect to cargo space and towing capacity. Some of the key features incorporated on the Edge that enables the larger tow capability include an engine oil cooler, larger radiator and updated cooling fans. This is just one of the many examples that show the functional difference between cars and trucks and further support the need to maintain separate car and truck attribute-based standards. [EPA-HQ-OAR-2010-0799-9463-A1, p. 8]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 34.]

Turning now to more specific comments of the proposed rulemaking, we support the relative manner in which car and truck targets have been set to reflect their respective capabilities to improve fuel economy.

Organization: General Motors Company

GM supports the proposed footprint-based CO_2 and CAFE standards for 2017-2021. [EPA-HQ-OAR-2010-0799-9465-A1, p. 2]

Organization: Institute for Policy Integrity, New York University School of Law

The agencies should rethink their footprint-based standards, which may be unnecessary to respect consumer preferences, may negatively impact safety, and are likely to be overall inefficient. Increasing the safety of one car can impose a negative safety externality on others, and consumer preferences can adjust as average fleet-wide attributes shift. As a result, trying to eliminate the incentive to build smaller cars may block a cost-effective compliance strategy and may not guarantee a safer fleet. [EPA-HQ-OAR-2010-0799-9480-A1, p. 2]

Part II. Vehicle Attributes

The agencies assume that the current market accurately reflects the range of consumer preferences for vehicle attributes like performance, carrying capacity, safety, and comfort, failing only with respect to fuel economy technology. The agencies want to ensure that the proposed rule will preserve both consumer choice and the same mix of vehicle options. If instead the rule were to impact vehicle attributes like size and power, the agencies worry that consumers might experience a loss in welfare, erasing some of the large net benefits the rule should generate for consumers and society. [EPA-HQ-OAR-2010-0799-9480-A1, p. 12]

To this end, the agencies take two steps. First, they tie the prescribed standards to vehicle footprint, so that larger vehicles will generally be subject to less stringent controls compared to smaller vehicles. Second, the agencies apply an assumption of constant performance to their cost estimates, believing that manufacturers will spend whatever extra it costs to maintain current vehicle attributes as they increase fuel economy. [EPA-HQ-OAR-2010-0799-9480-A1, p. 12]

The agencies should rethink both their attribute-based standards and their estimation of costs. First, the footprint-based standards may be unnecessary to respect consumer preferences, may negatively impact safety, and may be overall inefficient. Several arguments call into question the footprint-based approach, but a particularly important one is that large vehicles can impose a negative safety externality on other drivers. [EPA-HQ-OAR-2010-0799-9480-A1, p. 12]

Second, the agencies' constant performance cost estimates represent an upper bound to possible consumer welfare losses and are most likely overestimates, because vehicle attributes are partly positional and consumer preferences can shift with changing attributes. Similarly, the unlikely chance that the agencies' cost projections underestimate consumer welfare losses is further mitigated by the actual nature of consumer preferences. Finally, those same insights from positional goods theory and the bandwagon effect should be considered in the agencies' forecast for the future consumer market for new technologies like electric vehicles. [EPA-HQ-OAR-2010-0799-9480-A1, p. 12]

Footprint-Based Standards May Be Unnecessary to Respect Consumer Preferences, May Negatively Impact Safety, and May Be Overall Inefficient

The agencies choose to set regulatory stringency according to vehicle footprint, in part because the statute requires NHTSA to base standards on attributes related to fuel economy. The agencies offer five justifications for choosing a footprint-based approach: [EPA-HQ-OAR-2010-0799-9480-A1, p. 13]

• First, they claim the optimal attribute-based standard will achieve greater overall fuel savings than the optimal flat standard, since an attribute-based approach encourages all manufacturers to add new technologies every year, even those manufacturers with fleets that are already relatively efficient.

• Second, out of concerns for safety, the agencies want to remove the incentive to build smaller cars in order to comply with the standard.

• Third, the agencies believe the attribute-based approach will be more equitable than a flat standard, which could impose disproportionate burdens on some manufacturers.

• Fourth, the agencies want to preserve the current vehicle mix in the marketplace in order to respect consumer choice.

• Fifth, the agencies believe a footprint-based approach involves a lower risk of manufacturers "gaming" the system, at least compared to a weight-based approach. [EPA-HQ-OAR-2010-0799-9480-A1, p. 13]

All five justifications are problematic. [EPA-HQ-OAR-2010-0799-9480-A1, p. 13]

The first justification assumes that attribute-based approaches will increase overall fuel savings since, under a flat standard, manufacturers with fleets that are already relatively fuel efficient would have little incentive to continue upgrading. However, this claim very much depends on whether the proposed attribute-based standard is actually optimal: an inefficient footprint-based standard is unlikely to achieve greater overall fuel savings than the optimal flat standard. [EPA-HQ-OAR-2010-0799-9480-A1, p. 13]

Moreover, given that reducing vehicle size, weight, and performance are relatively cheap and readily available compliance options,84 even the optimal footprint-based standard may suffer from inefficiencies by disincentivizing an otherwise cost-effective strategy. Wenzel's research suggests that "a fuel economy standard that discourages vehicles with smaller footprint . . . will not be as effective in reducing fuel consumption and associated greenhouse gas emissions as a single stringent standard applied across all vehicle sizes. . . . A single stringent fuel economy standard would discourage the continued use of light trucks (with low fuel economy) as essentially substitutes for cars, and encourage greater use of lighter and smaller vehicles."85 [EPA-HQ-OAR-2010-0799-9480-A1, p. 13]

NHTSA should consider the advantages and disadvantages of all fuel economy-related attributes, and choose the attribute-based approach that will allow it to maximize net benefits of the rule; EPA should do the same with all possible approaches, including non-attribute, flat standards. One fuel economy-related attribute the agencies do not seem to have considered that may warrant analysis is vehicle fuel type. [EPA-HQ-OAR-2010-0799-9480-A1, p. 13]

Manufacturers could also decrease weight without decreasing footprint as a compliance strategy. The overall effects of such a choice on safety are not immediately clear, though at least some evidence suggests that redesigning truck-based SUVs into car-based crossover SUVs resulted in both lighter vehicles and decreased safety risks to drivers and others.91 [EPA-HQ-OAR-2010-0799-9480-A1, p. 14]

More importantly, the relationship between size and safety is neither simple nor unidirectional. To the extent smaller cars fare worse in crashes with bigger cars, increasing size may improve an individual driver's safety; but it may simultaneously impose a negative safety externality on other drivers, whose cars are now relatively smaller compared to the growing average fleet size. Decreasing size may have similarly opposing impacts on safety. Therefore, maintaining or increasing the average size of the entire fleet does not guarantee the safest outcome, and decreasing the fleet's average size in response to a fuel economy rule might have no overall change in safety levels (though at some point, reducing the size or changing attributes could affect the vehicle's intrinsic safety, as distinct from its relative safety). As Wenzel, a leading researcher on this subject, has explained, "a fuel economy standard that discourages vehicles with smaller footprint, or lower weight, will not necessarily reduce casualties. . . .Details of vehicle design, which can be improved through direct safety regulations, will have a greater effect on occupant safety than fuel economy standards that are structured to maintain vehicle size or weight."92 [This comment can also be found in section 13.1 of this comment summary.] [EPA-HQ-OAR-2010-0799-9480-A1, p. 14]

The third justification put forward is that a flat standard would inequitably affect some manufacturers more. However, to the extent that the fuel economy program can incorporate a trading scheme for compliance credits, the market would help smooth out any disproportionate impacts on certain manufacturers. Additionally, trading will ensure that manufacturers with relatively efficient fleets still have an incentive to continue improving fuel economy (in order to generate credits), which will further mitigate the agencies' first concern, mentioned above. [EPA-HQ-OAR-2010-0799-9480-A1, p. 14]

The fourth justification states that the agencies need to preserve the current vehicle mix in order to respect consumer choice. The agencies do not, however, adequately explain why maintaining the current vehicle mix is necessary to protect consumer welfare. The negative safety externality generated by larger vehicles indicates that the vehicle fleet may, on average, be too big; furthermore, some vehicle downsizing may represent a cost-effective method for compliance and have little impact on consumer welfare (as explained below). 94 Preserving the current vehicle mix is therefore not necessary to protect consumer welfare, and there is no reason to preserve the current mix as an end unto itself. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 14-15]

The fifth justification sees a footprint-based standard as a way to discourage "gaming" behavior, especially compared to a weight-based standard. A weight-based standard may be easier to game than a footprint-based standard, but that does not mean that manufacturers will not still game the proposed regulation in ways that reduce overall efficiency. In fact, it seems the footprint-based standard creates an incentive to expand vehicle size in order to relax the applicable standard. Given that automobile manufacturers already respond to very fine-tuned tax incentives for fuel economy,95 it certainly seems possible that the proposed rule will encourage some gaming of the average footprint. [EPA-HQ-OAR-2010-0799-9480-A1, p. 15]

NHTSA should remember that footprint and weight are not the only possible fuel economy-related attributes on which to base policy. For example, it might be much harder for manufacturers to game either a much flatter attribute-based standard or a standard differentiated by vehicle fuel type. EPA should assess whether a different approach, including a non-attribute, flat standard, might be the best at discouraging gaming. [EPA-HQ-OAR-2010-0799-9480-A1, p. 15]

In conclusion, a footprint-based standard may be unnecessary to respect consumer preferences, and may interfere with downsizing that could be, on the whole, consumer-welfare enhancing; it may have negative impacts on safety, given the negative safety externality that relative size can generate; and it may simply be inefficient compared to a more optimal, flatter standard. The agencies should seriously rethink whether the footprint-based approach is the best option. [EPA-HQ-OAR-2010-0799-9480-A1, p. 15]

If the agencies do go forward with a footprint-based approach, they should study its effects carefully and revisit the matter when more evidence is available. The first footprint-based fuel economy standards took effect with model year 2012.96The agencies therefore now have an opportunity to begin analyzing how the attribute-based standards influence manufacturers' production decisions. The agencies should consider whether the results of such a study challenge the footprint-based approach, at least during the planned mid-term evaluation, if not sooner. [EPA-HQ-OAR-2010-0799-9480-A1, p. 15]

The agencies should rethink their footprint-based standards, which may be unnecessary to respect consumer preferences, may negatively impact safety, and may be overall inefficient. Increasing the safety of one car can impose a negative safety externality on others, and consumer preferences can adjust as average fleet-wide attributes shift. As a result, trying to eliminate the incentive to build smaller cars may block a cost-effective compliance strategy and may not guarantee a safer fleet. [EPA-HQ-OAR-2010-0799-9480-A1, p. 20]

---

84 See generally Christopher R. Knittel, Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector (U.C. Davis Inst. of Transportation Studies UCD-ITS-RR-09-16, 2009).

85 Tom Wenzel, Analysis of the Relationship Between Vehicle Weight/Size and Safety, and Implications for Federal Fuel Economy Regulation, at 43 (Report for the U.S. Dep't of Energy, Lawrence Berkeley National Laboratory Paper LBNL-3143E, 2010).

88 Wenzel, supra note 85, at 7.

89 Id. A very few luxury car models have footprints in the 55-80 square feet range, which also have flat standards.

91 Wenzel, supra note 85, at 43.

92 Id.

94 See infra note 99, and accompanying text.

95 James Sallee & Joel Slemrod, *Car Notches: Strategic Automaker Responses to Fuel Economy Policy* (NBER Working PaperNo. 16604, 2010). Also see attached symposium paper on the energy paradox, at 11-12.

96 Proposed Rule, *supra* note 5, at 74,912.

Organization: Insurance Institute for Highway Safety (IIHS)

NHTSA has again proposed using vehicle footprint as the measure for varying CAFE requirements, and IIHS agrees that this will reduce the incentive for automakers to downweight or downsize vehicles to improve fuel economy. [NHTSA-2010-0131-0222-A1, p. 1]

Organization: International Council on Clean Transportation (ICCT)

17) Footprint Curves

We commend EPA and NHTSA for continuing to use a footprint-based adjustment to the CAFE standards instead of weight-based adjustments. Footprint-based adjustments fully encourage manufacturers to introduce lightweight materials, which can improve vehicle efficiency by 20% or more in the long run. Lightweight materials also extend the electric drive range of fuel cell and plug-in vehicles by a similar amount. This is one area of policymaking where the U.S. is ahead of the rest of the world. Japan, Europe, and China have all adopted standards with weight-based adjustments that effectively discourage the use of lightweight materials. [EPA-HQ-OAR-2010-0799-9512-A1, p. 48]

Organization: Mercedes-Benz USA, LLC

DAG also supports the overall structure of the attribute-based program and the provisions for transferring and trading credits. [This comment can also be found in section 10.1.2 of this comment summary.] [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

Organization: National Automobile Dealers Association (NADA)

All things being equal, NADA supports a final rule that provides vehicle manufacturers with the greatest degree of compliance flexibility. In most instances, compliance flexibilities are nothing more than accommodations designed to recognize, harness, and leverage consumer demand. Perhaps the best example of a well-designed compliance flexibility is the attribute based framework, which recognizes that the motoring public demands a range of light-duty vehicle types to meet their needs and desires. By preserving access to an essential mix of cars and trucks, the proposal leverages consumer demand to facilitate continuous improvements across all vehicle types, regardless of product mix. Moreover, when fuel economy standards are set properly, under the direction enacted by Congress, the incentive to downsize or down-weight is reduced, helping to preserve passenger safety. [EPA-HQ-OAR-2010-0799-9575-A1, p. 11]

Organization: Society of the Plastics Industry, Inc. (SPI)

SPI also supports the agencies' choice to incentivize the use of advanced lightweight materials and structures versus reductions in vehicle size by adopting a "footprint" approach to emission reductions. Composite throttle valve housing can be 30 percent lighter than its metal equivalent, and high precision engineering is producing replacements for metal parts. Body panels and bumpers made of plastic composites that perform comparably to those made of metal can be as much as 50 percent lighter, contributing to both greater fuel efficiency and safety by lowering the vehicle's center of gravity. And while approximately eight percent of the total vehicle weight of the average U.S. light vehicle is plastics and composites, a minimum of 30 percent (by weight; in one or more subsystems beyond interior trim) is achievable. [EPA-HQ-OAR-2010-0799-9492-A1, p.4]

Organization: United Automobile Workers (UAW)

First, the UAW is pleased that the EPA and NHTSA are proposing to continue the joint system that preserves in both regulations the attribute-based framework mandated by EISA. This structure eliminates the discriminatory impact of the old CAFE system on full-line producers and allows for greater fuel savings and greenhouse gas emissions reductions by requiring improvements from all manufacturers regardless of their product mix. [EPA-HQ-OAR-2010-0799-9563-A2, p.2]

Response:

Most of the comments received on this issue support the continued use of footprint from the MYs 2012-2016 rule as the most appropriate vehicle characteristic for a single-attribute standard (AAM, Consumer Reports, IIHS, ICCT, NADA, UAW, and others). Commenters requesting that EPA use a different approach generally suggested one of two alternatives: either use a weight-based standard to harmonize with the standards of other nations, or use a multi-attribute standard which accounts for vehicle characteristics that impact performance, such as engine power. IPI suggested that the agencies consider a flat standard. Detailed responses to these comments are provided in preamble II.C.

Regarding international harmonization, EPA agrees with BMW that the use of vehicle weight as the primary attribute would result in standards that, in that respect, are similar to those in Europe, China, and Japan. However, as in the MYs 2012-2016 rule, EPA continues to believe that the benefits of harmonization with the European standards do not outweigh the detriments. Setting a weight-based GHG standard removes much of the incentive for manufacturers to use weight saving materials as a technique to reduce fuel consumption and CO2 emissions. Manufactures are currently using various mass reduction techniques across the light-duty fleet, and are likely to continue to do so throughout the MYs 2017-2025 rulemaking timeframe. When combined with other technologies, EPA believes that manufacturers can achieve compliance with the standards by applying mass reduction at levels that do not affect overall societal safety, as discussed in chapter 3.3.5 of the Joint TSD and section II.G of the preamble. Significantly, the agencies believe that a footprint based standard is also more difficult to game and has inherent advantages in terms of providing appropriate compliance options for vehicles at all sizes and cargo carrying capabilities, as discussed in preamble II.C.2.

Regarding the use of a multi-attribute standard, EPA believes that it would be inappropriate to base the GHG standard on engine power as an explicit attribute, as requested by Ferrari and Porsche. Vehicles with higher engine power tend to have higher CO2 emissions due to their typically larger displacements, and the fact that the engines operate at lower average loads over the two-cycle test procedure. To base the GHG standard on engine power would encourage manufactures to forego technologies and design strategies that decrease fuel economy and CO2 emissions, and could encourage vehicles with inherently higher power and consequently innately higher CO2 emissions as a means of compliance.

EPA acknowledges that there is a demand for high performance vehicles and provided a number of compliance mechanisms for manufacturers of these vehicles in this regulation. No individual vehicle need meet its target, allowing larger manufacturers to account for high performance vehicles by averaging with vehicles with more typical levels of acceleration performance. Smaller manufacturer provisions such as the intermediate volume and SVM flexibilities provide allowances for smaller manufacturers which typically have limited product lines and fewer opportunities to average. Due to their performance and luxury features, these vehicles also tend to have higher prices and higher profits. Thus it is possible that these vehicles will be better able to absorb the cost of higher cost vehicle efficiency technologies than vehicles with lower profit margins. Limited line manufacturers may also choose to purchase credits as a compliance mechanism. See section III.B.6 and III.C for a greater discussion of these program provisions.

As a further response, the analysis supporting this rule considers the adoption of technologies which maintain all vehicle attributes and includes the costs to do so as a cost of the rule. See EPA RIA at 1-40. It is important to note that these standards have been appropriately designed to maintain consumer choice. See International Harvester v. EPA, 478 F. 2d 615, 640 (D.C. Cir. 1973) (EPA required to consider issues of basic demand for passenger vehicles in making technical feasibility and lead time determinations in section 202 rules). The footprint based standards have been designed to discourage changes in vehicle size as a compliance strategy, and the agencies' technology penetration analysis for these standards included costs to preserve the utility of vehicles in the current fleet.

IPI presented a number of comments on the form of the standard, and suggested that the agencies consider flat standards, or alternatively, a standard whose form maximizes net benefits. These issues are discussed in preamble II.C.2. In short, with regard to a flat standard, NHTSA is required by statute to issue an attribute based standard, and for purposes of harmonization (in addition to those reasons are articulated in TSD 2.1 and 2.2), EPA has also issued an attribute based standard. While IPI's suggestion that the agencies select the attribute-based approach that maximizes net benefits may have merit, net benefits are but one of many considerations which led to the setting of the standard. Estimations of net benefits in future analyses are subject to significant uncertainties, which is among the reasons EPA uses technical analysis and reasonable judgement to inform its regulatory policies.

IPI also commented that "given that reducing vehicle size, weight, and performance are relatively cheap and readily available compliance options, even the optimal footprint-based standard may suffer from inefficiencies by disincentivizing an otherwise cost-effective strategy." While downsizing and downpowering vehicles may be relatively inexpensive techniques (from a manufacturer's perspective) to reduce GHG emissions, changes to these attributes may have unintended consequences for consumer welfare. In addition, as many commenters (e.g. NADA) have legitimately pointed out, the rule's benefits only accrue if consumers purchase the new vehicles with GHG emission reducing technologies. Removing otherwise desired vehicle attributes could lead to less consumer acceptance. See Preamble section III.H.1.a noting that one reason for the so-called energy paradox (why consumers have in the past valued fuel economy less than its actual value) is that consumers might associate higher fuel economy with inexpensive, less well designed vehicles. As such, EPA has promulgated a standard and shown a compliance path that doesn't require changes to these attributes.

2.2. Stringency of Standards

2.2.1. Overall Stringency

Organizations Included in this Section

Alexandria Hyundai
Alliance of Automobile Manufacturers
American Chemistry Council (ACC)
American Council for an Energy-Efficient Economy (ACEEE)
Anonymous public citizen 2
Anonymous public citizen 3
Anonymous public citizen 5
Association of Global Automakers, Inc. (Global Automakers)
Bassett, S.
BMW of North America, LLC
California Air Resources Board (CARB)
Capozzelli, J.
Center for Biological Diversity
Chrysler Group LLC
Consumer Federation of America (CFA)
Consumer Reports
Consumers Union
Ecology Center
Environmental Consultants of Michigan
Ferrari
Ford Motor Company
Growth Energy
Haroldson, C.
Honeywell International, Inc.
Honeywell Transportation Systems
Howard, P.
Hrin, S.
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Jackson, F.W.
Manufacturers of Emission Controls Association (MECA)
Marlinghaus, E.
Marshall, C.
Mass Comment Campaign (10) (National Wildlife Federation Action Fund-1)
Mass Comment Campaign (4,505) (Unknown Organization)

Mass Comment Campaign (61) (The Social Justice Group)
Massachusetts Institute of Technology (MIT)
Mercedes-Benz USA, LLC
Miller, P.
National Association of Clean Air Agencies (NACAA)
National Automobile Dealers Association (NADA)
National Wildlife Federation (NWF)
Northeast States for Coordinated Air Use Management (NESCAUM)
RVIA
Smith, Frank Houston
Society of the Plastics Industry, Inc. (SPI)
Susan R.
Tarazevich, Yegor
Toyota Motor North America
Union of Concerned Scientists (UCS)
United Automobile Workers (UAW)
Van Coppenolle, J. and L.
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: Alexandria Hyundai

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 66.]

The 54.5 MPG target for 2025 represents a significant advance from where we are as an industry today.

Organization: Alliance of Automobile Manufacturers

The agencies should assure equivalent program stringency. The proposed EPA and NHTSA requirements are coordinated, but not fully harmonized. The Alliance believes that adjustments to the NHTSA program are needed to ensure that it properly harmonizes with the EPA requirements under the differing statutory authorities provided to the agencies. [EPA-HQ-OAR-2010-0799-9487-A1, p.4]

Adjusting for Year-Over-Year Stringency [EPA-HQ-OAR-2010-0799-9487-A1, p.86]

The NPRM describes the methodology for adjusting standard curves for year-over-year stringency increases, noting that for the MY 2017-2025 rules, the curves are adjusted on a relative basis (applying the same percentage reductions in a given year across the entire footprint range). This method is in contrast to the methodology used in the MY 2012-2016 rules, where curves were adjusted on an absolute basis (applying the same absolute gram per mile and fuel consumption reductions in a given year across the entire footprint range). The agencies request comment on their conclusions and invite further recommendations for other means to adjust the standard curves for year over year stringency increases. [EPA-HQ-OAR-2010-0799-9487-A1, p.86]

Given that many of our member companies support the standards as proposed, the Alliance declines to make comments on specific changes. However, we believe that the agencies should examine their approach to adjusting the curves for year-over-year stringency as part of the mid-term evaluation to determine if actual improvements made in the 2012-2016 model year period suggest a declining correlation between the footprint attribute and vehicle emissions/fuel consumption (supporting adjustments on a relative basis) or whether the correlation remains roughly the same as observed in the 2008 model year fleet (supporting adjustments on an absolute basis). [EPA-HQ-OAR-2010-0799-9487-A1, p.86]

Organization: American Chemistry Council (ACC)

We do not comment on the CAFE levels proposed except to reaffirm that the levels proposed by the agencies are technologically feasible and economically practicable as a matter of statue. [EPA-HQ-OAR-2010-0799-9517-A1, p. 2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 264.]

We support the specific fuel efficiency goals and time limits proposed in the standard.

Organization: American Council for an Energy-Efficient Economy (ACEEE)

Overall Stringency of Standards

The agencies propose target curves for the standards obtained by adjusting the curves discussed in the previous section. We support the agencies' decision to shift the target curves vertically by application of fixed percentages rather than by simply translating them up or down, as was done previously (Joint TSD 2-51). The new approach is clearly more consistent with the objective of preserving the relationships among stringencies of the targets across footprints. [EPA-HQ-OAR-2010-0799-9528-A2, p.7]

We do, however, have concerns about the agencies' choice of curves among all the curves generated in this way. Section III.D.6 of the NPRM discusses the alternatives considered by EPA, a total of four in addition to the proposal and a reference case. Each of the four considers a standard for either cars or trucks that is 20 gpm more or less stringent that the proposed standards. All four alternatives, in addition to the proposed standards, are found to be achievable, except by a single, small-volume manufacturer (Ferrari). Based on this result, it is unclear why one of the more stringent alternatives, e.g. Alternative 2, or another more stringent standard, would not be superior to the proposed standard. EPA shows that Alternative 2 would cost about $500 more per vehicle, but does not make the case that Alternative 2 is not cost-effective. The crux of EPA's lengthy argument that it has chosen the best standard seems to be that more stringent alternatives such as Alternative 2 call for a substantially greater penetration of advanced technologies, particularly hybrids but also including EVs and PHEVs. These alternatives adhere to technology penetration rates that fall within the caps set by EPA to ensure feasibility, however. Within those parameters, it seems reasonable that an alternative demanding higher penetration rates for advances technologies is preferable, especially given that promoting the development of advanced technologies is among the objectives of the rule. [EPA-HQ-OAR-2010-0799-9528-A2, pp.7-8]

The argument for the superiority of the proposed standards is all the weaker in view of the fact that EPA did not take into account the various flexibilities that have been proposed, such as credits for plug-in vehicles and hybrid credits for large pickups. We also note that the projected percentage of hybrids purchased in 2025 (15 percent, NPRM p.75061) is at the low end of the penetration suggested in the NOI (3-14 percent in the 4 percent per year scenario, 25-65 percent in the 5 percent per year scenario), once again raising the question of whether the proposed standards are the maximum achievable. [EPA-HQ-OAR-2010-0799-9528-A2, p.8]

Recommendations Reconsider whether alternative standards such as Alternative 2 that deliver greater benefits than the proposed standards are achievable and cost-effective. Show compliance costs by manufacturer for all years in the NPRM. [EPA-HQ-OAR-2010-0799-9528-A2, p.8]

Organization: Anonymous public citizen 2

The most obvious and most simple is not to use more corn gasoline, but to double the efficiency of vehicles. Lead consumers to purchase smaller cars and trucks. To see what the auto makers have done just take a look at pickup trucks. They have discontinued smaller trucks and cars. Each year they are just a little bigger. [EPA-HQ-OAR-2010-0799-1359, p.1]

Instead of giving subsidies to grow alternative fuels, lets give incentives to have consumers smaller vehicles. [EPA-HQ-OAR-2010-0799-1359, p.1]

We also need to develop more efficient vehicles. But reducing the vehicle mass would result in less fuel being used. [EPA-HQ-OAR-2010-0799-1359, p.1]

Organization: Anonymous public citizen 3

Increase the goal from 54.5 mpg to 100 mpg. It's time to lead. [EPA-HQ-OAR-2010-0799-2001, p.1]

Organization: Anonymous public citizen 5

The Proposed Legislation is not founded on any sound scientific conclusions. The affects of basing legislation on technology that does not exist is irresponsible and irrational. Instead of punishing the consumer by forcing pseudoscience based laws onto the manufacturers, why don't you create incentives for innovation? [EPA-HQ-OAR-2010-0799-2010, p.1]

Organization: Association of Global Automakers, Inc. (Global Automakers)

The standards proposed by the agencies are extremely stringent and are based on a large number of assumptions about technology and the auto market over the next decade. By extending the standards for many years into the future, the agencies provide manufacturers with substantial lead-time, which is of great value in compliance planning. On the other hand, the long time frame means that standards in the later years will be based on relatively long-range projections and assumptions. [EPA-HQ-OAR-2010-0799-9466-A1, p. 1]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 65-66.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 50.]

Organization: Bassett, S.

Also a true 54.5 MPG is unrealistic. Have you people never heard of the laws of physics? It will take x amount of energy (regardless of fuel type) to move a weight (auto) a distance of x. [EPA-HQ-OAR-2010-0799-8123-A1, p. 1]

Organization: BMW of North America, LLC.

The framework for model years 2017-2025 sets very ambitious GHG and fuel economy standards which can only be achieved through the adoption of all proposed compliance flexibilities. [EPA-HQ-OAR-2010-0799-9579-A1, p. 1]

Compliance will also require significant automaker efforts to reduce vehicle emissions coupled with public policy measures for steering market demand towards more fuel efficient vehicles. This is particularly true for E-mobility where customer acceptance and future growth in demand will depend largely on vehicle affordability, measures to address range concerns, and infrastructure availability for public recharging. Significant market penetration of electric vehicles, especially in the latter years, is needed to ensure automakers' compliance with these proposed standards covering MYs 2017 through 2025. [EPA-HQ-OAR-2010-0799-9579-A1, p. 2]

As a premium manufacturer, BMW designs and builds vehicles with outstanding product characteristics in order to satisfy higher customer expectations compared to other manufacturers, yet with similar vehicle footprints. Consequently, our product and specific US premium vehicle market characteristics require increased levels of technology in order to meet future standards compared to other manufacturers. Many of the technologies mentioned in the draft joint Technical Support Document have already been implemented in BMW Group models. Therefore, the significant penetration of these advanced conventional technologies in our existing fleet will make it even more challenging for BMW to achieve compliance with these very stringent standards. [EPA-HQ-OAR-2010-0799-9579-A1, pp. 3-4]

Organization: California Air Resources Board (CARB)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 10-12]

As you know, at the President's request, CARB participated in the development of the greenhouse gas standards that you are considering today. We shared our knowledge developing the nation's first greenhouse gas standards which were adopted back in 2004 and became effective in California and 10 other states with the 2009 models. We contributed to new studies that form some of the technical underpinnings of the EPA proposal and co-authored with the federal agencies the Technical Assessment Report that was issued in late 2010. We continue to work with the federal agencies to ensure that the proposed EPA greenhouse gas standards could be used as an alternative to California's standards and result in a unified set of regulations that would allow vehicle manufacturers to produce a single vehicle model that would meet state and federal greenhouse gases and federal fuel economy standards. We believe your proposal is consistent with these objectives.

Our proposed greenhouse gas standards are nearly identical to what you are proposing. Our analysis of the costs and benefits draws from the many hours of discussion we had with your staff on the best information and the latest analytical techniques to use in our respective regulatory documents.

For this to become a reality, EPA needs to finalize its standards largely as currently proposed.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 13-15.]

In addition to the greenhouse gas standards, CARB's Advanced Clean Car proposal includes new exhaust and evaporative emission standards for hydrocarbons, oxides and nitrogen and particulate matter starting with 2015 models. These standards will reduce the said emissions by roughly 75 percent by the 2025 models with similar reductions in particulate conditions.

These reductions will help our urban areas meet the more stringent health-based ambient air quality standards that are forthcoming. And the costs of achieving these standards is low and the technology is readily available. We have tailored the implementation schedule of these standards to be compatible with the gradual tightening of greenhouse gas standards, so that the greenhouse gas, smog-forming and soot-emission reductions can be addressed in an efficient manner by the development engineers of the car companies.

Our Advanced Clean Car package also includes a proposal to strengthen the ZEV mandate. Ten other states and the District of Columbia have adopted this program which collectively account for a little more than a quarter of all sales of passenger vehicles in the nation. By 2025 we are proposing that 15 percent of all passenger vehicles sold in California and its partner states be ZEVs, which include battery, hybrid and fuel cell vehicles.

We point this out because the extremely low or nonexistent greenhouse gas emissions of these zero-emission vehicles will count towards compliance with the national standards. As you know, the analysis of the proposed federal standards indicates a significant number of ZEVs will not be needed to achieve compliance with the federal rules. Thus, placement of ZEVs in California and its partner states to meet the California ZEV mandate provides the emission reduction credits that reduce the reductions that must be achieved from the remainder of a vehicle manufacturer's fleet. This, of course, is only a side benefit of strengthening the ZEV mandate whose main objective is to push technology onto a sustainable pathway that will take us to an 80 percent reduction in greenhouse gas emissions by 2050.

Organization: Capozzelli, J.

However. the proposed rules are not strong enough. They contain a dangerous loophole that lets SUVs improve gas-mileage standards later than passenger vehicles. This will spur production of even more SUVs, and the auto industry is attempting to weaken these already-inadequate standards. Increasing the fuel efficiency of our vehicles is essential in the battle against dangerous climate change. [NHTSA-2010-0131-0221-A1, p.1]

These standards leave the United States behind Europe. Japan and China in fuel efficiency. In the long run, higher standards will benefit both American consumers and manufacturers by pushing innovation instead of stagnation. [NHTSA-2010-0131-0221-A1, p.1]

These rules can and should be significantly strengthened. [NHTSA-2010-0131-0221-A1, p.1]

All but one of the alternative standards discussed in the rule's would allow greenhouse gas emissions from cars and light trucks to increase through 2025; but dangerous climate change cannot be avoided unless greenhouse gases actually, decrease. The rules should adopt the alternative that actually decreases carbon pollution ever year through 2025. [NHTSA-2010-0131-0221-A1, p.1]

Organization: Center for Biological Diversity

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 214-216.]

We also do believe, though, the rules are not good enough. They are certainly not good enough when you look at the scale of the problems we face; and they are also not good enough when you look at what is technologically feasible and what is going on around the world.

And so while we really appreciate the fact that the rule is willing to increase fuel efficiency, we don't believe they do so fast enough, and they leave the U.S. far behind fuel efficiency standards in the European Union, Japan and China.

So we fear that putting these standards, which are a step forward and we appreciate the effort in place for the next 13 years until 2025, would still leave the U.S. behind what's happening in the EU, China and Japan instead of putting it as a forefront.

Clearly, the transportation sector is the low hanging fruit here and I realize a lot can be done here, a lot is being done, and we appreciate that effort, but we hope that you will look at strengthening these rules because of the gravity of the crises we are facing when you issue the final rule.

The Center supports the Agencies' efforts to limit greenhouse gas pollution from new passenger vehicles and light trucks, and we appreciate efforts the Agencies have made to respond to our comments to earlier CAFE and vehicle greenhouse gas rulemakings. But as we point out below, the current NPRM contains a number of significant flaws. We request that the Agencies remedy them to bring the forthcoming final MY 2017-2025 vehicle and greenhouse gas rulemaking into compliance with the Energy Policy and Conservation Act ("EPCA"), as amended by the Energy Independence and Security Act of 2007 ("EISA"), and the Clean Air Act ("CAA"). [EPA-HQ-OAR-2010-0799-9479-A1, p. 2]

The importance of achieving maximum feasible fuel efficiency, along with maximum feasible greenhouse gas reductions, in the 14 years between now and the end of 2025 cannot be overstated. As the Agencies themselves observe, "DOE has stated that vehicle efficiency has the greatest short-to mid-term impact on oil consumption." 1 Further, "20% of total U.S. CO_2 emissions come from passenger cars and light trucks," a total that amounts to 4% of global emissions. But the CAFE rules issued by the Agencies over the years, and therefore their effect on reducing greenhouse gas emissions, has failed to make inroads on the problem: "Passenger cars and light trucks . . . account for more than half of U.S. transportation CO_2 emissions, and CO_2 emissions from these vehicles have increased by 17 percent since 1990." The alternative the Agencies prefer would continue to increase greenhouse gas emissions through 2025. The Agencies should, for the first time in their history, reverse this trend and promulgate a rulemaking that reduces rather than increases greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-9479-A1, p. 2]

The targets adopted by the Agencies as the "preferred alternative" do not achieve emissions reductions, and do not constitute the maximum feasible fuel efficiency level under EPCA/EISA, nor protect the public health and welfare with an adequate margin of safety under the CAA. The "preferred" alternative would arrive at what is described in the NPRM as the "equivalent" of 54.5 mpg in 2025. This number, when expressed without adequate explanation, is misleading. In fact, when not inflated by air conditioning credits that lower greenhouse gas emissions but do nothing to increase fuel efficiency, the number is 49.6 mpg – though even that number signifies only the "estimated average required fleet-wide fuel economy"; once carmakers' use of various "flexibilities" and credits are accounted for, the estimated average "achieved" mileage drops to just 46.7 mpg. The actual real-world fleet-wide fuel efficiency number is even lower, translating to no more than approximately just 40 mpg (and 223 grams per mile). Because fuel efficiency itself, regardless of how it is counted, never exceeds 49.6 mpg, it is simply incorrect to claim a fuel efficiency "equivalent to" 54.5 mpg, and we urge the Agencies to clarify the effects of the rulemaking without referring to the highly ambiguous concept of equivalency. Equivalency relates to calculations of greenhouse gas emissions but in no way to mileage standards, a distinction certain to escape the average reader. But whether stated as 46.7 mpg or 49.6 mpg, the target is insufficient. [EPA-HQ-OAR-2010-0799-9479-A1, pp. 2-3]

The failure to implement maximum feasible mileage standards through the next 14 years – a period exceeding the years between 2010 and 2020 that have been named the "critical decade" because of their unparalleled importance in the effort to avoid the most drastic effects of climate change – would not only be in violation of Congressional mandates, but would also constitute a regulatory failure of potentially irremediable proportions. Only Alternative 4 actually reduces greenhouse gas emissions. Adopting any other alternative will also continue to leave the U.S. far behind its competitors in the global automotive market. The preferred alternative is far from what is both technically and economically feasible to reduce the nation's dependence on foreign oil. [EPA-HQ-OAR-2010-0799-9479-A1, p. 3]

Below we point out the various deficiencies inherent in the rulemaking. Among the most egregious is the laundry list of near-exemptions, credits, and other give-aways that would be provided to the largest and least efficient vehicles covered by the rulemaking: the SUVs, pickup trucks and other "light trucks" that have constituted the most profitable vehicle class, and that have proliferated on America's highways while stymieing real progress on fuel efficiency for decades. Yet, this rulemaking would reintroduce the SUV loophole with a vengeance. We encourage the Agencies to address these deficiencies, abandon the preferred alternative and instead drive industry to use the next 14 years to overhaul, rather than merely tinker with, vehicle technology and achieve the results the statutes demand. [EPA-HQ-OAR-2010-0799-9479-A1, p. 3]

1. The Agencies must set fuel efficiency standards that achieve maximum fuel efficiency and energy conservation

The Agencies' discussion of the factors that must be considered in setting CAFE standards – and, more importantly, the manner in which the Agencies weigh them – must be corrected in a number of ways. While noting in passing that they cannot undermine energy conservation, the Agencies nonetheless list energy conservation merely as one among many factors to consider, failing to discern that it is the overriding purpose of the statutes. That energy conservation has been ignored or, at a minimum, arbitrarily relegated to secondary or tertiary importance, is evident from the following statement: [EPA-HQ-OAR-2010-0799-9479-A1, p. 4]

While the GHG emissions targets do become more stringent each year, the emissions targets have been selected to allow compliance by vehicles of all sizes and with current levels of vehicle attributes such as utility, size, safety, and performance. Accordingly, these proposed standards are projected to allow consumers to choose from the same mix of vehicles that are currently in the marketplace. [EPA-HQ-OAR-2010-0799-9479-A1, p. 4]

In other words, the Agencies have selected standards that value purported consumer choice and the continued production of every vehicle in its current form over the need to conserve energy: as soon as increased fuel efficiency begins to affect any attribute of any existing vehicle, stringency increases cease. That is clearly impermissible and contrary to Congressional purpose.17 Given this outcome, it is not surprising that, as has been widely reported, the NPRM is the result of an "agreement" between the Agencies and the regulated industries – something that, at a minimum, taints the objectivity of the rulemaking process but instead is touted as an accomplishment.18

Protecting “the same mix of vehicles currently on the market” or the “current levels of vehicle attributes” is decidedly not the Agencies’ task. [EPA-HQ-OAR-2010-0799-9479-A1, p. 4]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 215-216.]

Secondly, all but one of the alternative standards discussed in the rules would allow overall greenhouse gas emissions from cars and light trucks to increase in 2025. And given the climate crisis, we don't believe we can afford this, and so we would look at pushing for fuel efficiency standards in the range of 60 miles per gallon rather than 54, which is the current proposal, and real world looks more like something like 49.

G. The Agencies Should Adopt Alternative 4

As we pointed out in our comments to the DEIS, only Alternative 4 would actually reduce greenhouse gas emissions from the nation’s vehicle fleet; for all of the reasons stated, adopting this standard is a necessity if exceptional damage from climate change is to be avoided. [EPA-HQ-OAR-2010-0799-9479-A1, p. 23]

Cars achieving and even exceeding the fuel economy level of 69 mpg, reached by Alternative 4 by 2025, are already on the road today, such as the Toyota Prius and the Nissan Leaf.106 Accordingly, it is clear that 69 mpg by 2025 is technically feasible 14 years from now. Indeed, it is beyond question that a fleet-wide average of 62 mpg (representing approximately a 6% annual increase) can be achieved based mostly on existing, off-the-shelf technologies, such as downsized turbocharged engines, electric power-train design, regenerative breaking, six-and seven-speed transmissions, high strength, high-strength lightweight materials, and enhanced aerodynamic designs.107 As stated above, to arrive at a technology-forcing alternative, NHTSA must push beyond existing technologies and include those still in the research and development stage in its modeling assumptions, which can model uncertainties concerning adoption and fleet penetration the Agencies perceive. Doing so demonstrates that Alternative 4 will be technologically feasible in the time provided. [EPA-HQ-OAR-2010-0799-9479-A1, p. 23]

The Agencies in the past have justified decisions not to adopt higher stringency standards because of concerns about economic feasibility. But the economic benefits of the rulemaking here would exceed its costs by more than $300 billion, at a minimum. And, even leaving aside the huge benefits external to the immediate purchase transaction, it is clear that fuel savings alone will more than make up for realistically estimated vehicle cost increases. We note here that the Agencies present no analysis of maximized societal benefits, where the benefits most optimally compare to the anticipated costs. In other words, there is no rigorous analysis of economic feasibility that justifies rejecting Alternative 4 as the appropriate standard for this rulemaking. Energy conservation along with the prevention of extreme climate change damages, however, demands it. Because Alternative 4 is both technological and economic feasible and best promotes energy conservation, it must be adopted. [EPA-HQ-OAR-2010-0799-9479-A1, p. 23]

The Agencies' preferred alternative of 49.6 mpg clearly does not constitute the maximum feasible fuel economy level because other countries will surpass that number (and in case of the EU, far surpass it) five years earlier, by 2020: by then, the EU will have achieved 64.8 mpg, Japan 55.1 mpg, and China 50.1 mpg.108 The following graph demonstrates this point: [See figure on p. 24 of Docket number EPA-HQ-OAR-2010-0799-9479-A1] [EPA-HQ-OAR-2010-0799-9479-A1, p. 24]

Given the accelerating rapidity of technical improvements, reaching 69 mpg by 2025, five years after Europe reaches 64.8 mpg, is clearly feasible and is the alternative the Agencies should embrace. [EPA-HQ-OAR-2010-0799-9479-A1, p. 24]

---

106 The Prius, for example, achieves 71 mpg in CAFE testing. See UCS, Translating New Auto Standards Into On- Road Fuel Efficiency at 2 (May 2011), available at http://www.ucsusa.org/clean_vehicles/solutions/cleaner_cars_pickups_and_suvs/clean-car-standards-resourcecenter. html. [EPA-HQ-OAR-2010-0799-9479-A1, p. 23]

107 UCS, The Road Ahead at 3 (Sept. 2010), available at http://www.ucsusa.org/clean_vehicles/solutions/cleaner_cars_pickups_and_suvs/clean-car-standards-resourcecenter. html; see also Interim Joint Technical Assessment Report in this docket, which finds that technologies to achieve a 6% annual efficiency increase are available today or will become available and, as compared to the other standards it analyzed, would provide the largest societal gains, far exceeding costs, and deliver the greatest net lifetime owner savings and greenhouse gas reductions. [EPA-HQ-OAR-2010-0799-9479-A1, p. 23]

108 International Council on Clean Transportation, Global Comparison of Light-Duty Vehicle Fuel Economy/GHG Emissions Standards (Aug. 2011), Figure: Historical Fleet Fuel Economy Performance and Current or Proposed Standards, available at http://www.theicct.org/global-passenger-vehicle-standards-update. [EPA-HQ-OAR-2010-0799-9479-A1, p. 24]

---

1 Draft Environmental Impact Statement for Corporate Average Fuel Economy ("CAFE") Standards, Passenger Cars and Light Truck Model Years 2017-2025 ("DEIS") at S-7. [EPA-HQ-OAR-2010-0799-9479-A1, p. 2]

17 CBD v. NHTSA, 538 F.3d at 1195. [EPA-HQ-OAR-2010-0799-9479-A1, p. 4]

18 See, e.g., Jason Plautz, Fuel Economy: Cost Concerns Still Dog Newly Released CAFE Standards, GREENWIRE, Nov. 4 2011. [EPA-HQ-OAR-2010-0799-9479-A1, p. 4]

Organization: Chrysler Group LLC

The challenge of meeting the proposed 2025 MY standards must not be underestimated. We believe it's important to observe that reaching the projected overall average of 163 grams per mile of carbon dioxide will require manufacturers to make unprecedented reductions in light-duty vehicle greenhouse gas emissions and fuel consumption following the large improvements which will be necessary in the 2012-2016 model years. Market acceptance of the technologies required (and costs incurred) to meet these standards will be a critical factor in the success of the 2017-2025 MY National Program; customer choice and uptake will ultimately determine the success of this program. [EPA-HQ-OAR-2010-0799-9495-A1, p. 1]

The proposed 2017-2025 standards are very aggressive. Manufacturers are only beginning their compliance with the 2012-2016 National Program, which will drive a 24% improvement over the 2008 MY baseline to achieve the 2016 MY standard. The proposed standards for 2017-2025 model years continue this unprecedented rate of improvement, driving an additional 35% improvement over roughly two product cycles. These improvements will be made possible, in part, through flexibilities such the recognition of air conditioning and off-cycle improvements and incentive programs such as the "game-changing" pickup truck incentives and advanced technology vehicle multipliers for electric, plug-in hybrid electric and CNG vehicles. [EPA-HQ-OAR-2010-0799-9495-A1, p. 5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 51-52.]

The challenge of meeting the proposed standards must not be underestimated. We believe it's important to observe that reaching the projected overall average of 163 grams per mile of carbon dioxide in model year 2025 will have to be achieved within 13 years or approximately two product cycles.

[This comment was also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 24.]

The proposed 2017-2025 National Program reaches thirteen years into the future. Setting standards this far into the future provides long-term fuel economy and greenhouse gas goals to automotive manufacturers and suppliers enabling strategic planning for the needed improvements. However, this lead-time comes at the cost of less certain estimates for technology development, cost, and customer acceptance and demand. [EPA-HQ-OAR-2010-0799-9495-A1, p. 5]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 58.]

We believe it is important to observe that reaching the projected overall average of 163 grams per mile carbon dioxide in model year 2025 will have to be achieved within 13 years or roughly two product cycles.

Organization: Consumer Federation of America (CFA)

The proposed rule recognizes the need to keep the standards in touch with reality in several important ways.

The standards are set at a moderately aggressive level that is clearly beneficial and achievable.

The cost estimates are consistent with the results of independent analyses of technology costs made over the past decade.

The proposed standards are consistent with the rate of improvement that the auto industry achieved in the first decade of the fuel economy standard setting program.

The new approach to setting standards is consumer-friendly and facilitates automaker compliance. The standards do not require dramatic shifts in power train technologies or reductions in weight and offer flexibility and incentives for new technologies, and include a mid-term review.

The setting of a coordinated national standard that lays out a steady rate of increase over a long time period gives consumers and the industry certainty and time to adapt to change. [EPA-HQ-OAR-2010-0799-9419-A1, p. 8]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 90-91.]

The standards accelerate the adoption of existing technologies at costs that are widely recognized. They provide incentives in flexibility for new technologies.

The setting of a long steady path over a long time period coordinated across all the agencies in this country gives consumers and the industry the time they need to adjust.

Fifth, the auto industry has a strong incentive to comply. The standard takes the risk out of investing in fuel efficiency. All the auto makers have to do -- you don't have to worry about some guy manufacturing cheap fuel inefficient cars. They all have to comply.

Organization: Consumer Reports

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 168.]

The proposed targets are aggressive, but they're also conservative enough to allow the manufacturers to increase the deployment of new technologies to meet these requirements.

Organization: Consumers Union

Because the proposed rule provides ample lead time—approximately two and a half design cycles by 2025—automakers will be able to incorporate more efficient technologies and materials into the vehicles at a measured pace, thus reducing compliance costs and putting everyone on the same playing field in the race to find the best, most efficient way to meet new fuel economy targets. The proposed targets are aggressive enough to encourage groundbreaking new technological advances, but conservative enough to be attained even with strong incremental improvements and increased deployment of existing technology. [EPA-HQ-OAR-2010-0799-9454-A2, p.2]

Organization: Ecology Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 188-189.]

Second, we do like the longer time frame contained in the proposed rules. By looking out further into the future the rules can ensure consistency of approach and allow manufacturers to better plan for the vehicles that they will need to develop.

Organization: Environmental Consultants of Michigan

Tailpipe greenhouse gas standards (the flip side of CAFÉ) cannot achieve the target reductions

Using the latest government greenhouse gas lifecycle model for the transportation sector, GREET 2011, one can conclude that achieving carbon neutrality through tailpipe emission standards is not within the realm of possibility. [NHTSA-2010-0131-0166-A1, p. 3]

According to the 2011 Department of Energy greenhouse gas model, replacing the entire on road fleet of light duty cars and trucks with gasoline powered vehicles that achieve over 125 miles per gallon is necessary to reduce segment GHGs by 80%. This is not a CAFÉ standard of 125 mpg but every car and truck on the road would have to achieve this level of on-road efficiency. These levels are more than double the proposal. [NHTSA-2010-0131-0166-A1, p. 3]

Battery electric vehicles are even less useful in reaching the goal of carbon neutrality. Replacing every car and truck on the road with electric vehicles would reduce GHG emissions by only 26% at a cost of $2.5 trillion plus the cost of additional fuel production. Advocates of the electric option opine that use of carbon free electricity will be prevalent in the future. The federal government recently invested a half trillion dollars in the solar power company Solyndra only to have the company go bankrupt. The dream of solar power is a long way off. Others point to wind power as the solution for electricity. Already environmentalists are lining up protesting wind farms because of the noise pollution and the fact that the turbine blades kill large numbers of migratory birds7. Nuclear power is not supported by environmentalists and hydropower can also present problems for endangered species. [NHTSA-2010-0131-0166-A1, pp. 3-4]

Replacing every car and truck on the road with a hydrogen fuel cell powered vehicle would reduce GHG emissions by only 41% at a cost of $2.5 trillion not counting the fuel infrastructure cost. Hydrogen is one of the most difficult fuels to transport because of the corrosive effect of hydrogen on most metals. [NHTSA-2010-0131-0166-A1, p. 4]

Agency Was Arbitrary and Capricious In Its Selection of Standards

The Agency suggests the proposed standards of 50 miles per gallon could be achieved at a cost of about $2000 per vehicle. Even a cursory look at the data from EPAs 2012 model year fuel economy mileage guide demonstrates this review was arbitrary and capricious. [NHTSA-2010-0131-0166-A1, p. 5]

Only seven of the 900 plus models listed in the 2012 model year fuel economy guide would meet the 2025 model year proposed standards; one hydrogen fuel cell vehicle, three battery electric vehicles and three hybrid electric vehicles. As demonstrated above, hydrogen and electric vehicles cannot achieve the necessary greenhouse gas emissions and cost substantially more than $2000 per vehicle. [NHTSA-2010-0131-0166-A1, p. 6]

The median MSRP price increase for a hybrid electric vehicle in the 2011 model year was over $7000. Using the EPAs own fuel economy benefit and annual fuel costs published in the fuel economy guide it would take over 273,000 miles of driving to pay off the initial price premium for the average hybrid10 not counting the battery11 replacement every 10 years. The breakeven mileage for the highest selling hybrid electric vehicle, the Toyota Prius, is over 226,000 miles not counting the battery replacements. The second highest selling hybrid electric vehicle, the Honda Civic, never reaches its breakeven mileage. Over half the hybrid electric vehicles in the market last year would never12 reach their breakeven point according to EPA annual fuel costs not factoring in the cost of replacement batteries. More than half (60%) of 2012 model year hybrid electric vehicles (Table 3) were more than 10 miles per gallon below their 2025 model year target and all the hybrid electric vehicles have 6 or more forward gears. The average shortfall for all hybrid electric vehicles was over 9 miles per gallon. [Table 3 can be found on p. 24 of Docket number NHTSA-2010-0131-0166-A1] [NHTSA-2010-0131-0166-A1, p. 6]

Hybrid electric vehicles have been in the market for fourteen years and still represent less than 2.5% of sales despite generous subsidies. There were 26 hybrid electric vehicles in the market in 2011 yet over half the sales were a single model. Hybrids are having a difficult time gaining acceptance in the marketplace likely due to the economic reality that they do not save consumers money. [NHTSA-2010-0131-0166-A1, p. 6]

The median price increase for a diesel engine in the 2012 model year is over $5000. Using the EPA fuel economy benefit and annual fuel costs it would take over 214,000 miles of driving to pay off the initial price premium. Eighty-five percent of 2012 model year diesel equipped vehicles (Table 4) were more than 10 miles per gallon below their 2025 model year target despite having six or more forward gears. The average shortfall was over 12 miles per gallon. Thus advanced technology diesel and hybrid technology as currently deployed in the market are insufficient to meet the projected standards and cost substantially more than the Agency estimates. [Table 4 can be found on p. 25 of Docket number NHTSA-2010-0131-0166-A1] [NHTSA-2010-0131-0166-A1, p. 6]

Ninety percent of the 50 most fuel efficient non-hybrid 2012 model year trucks (Table 7) were more than 10 miles per gallon short of their 2025 model year target. The average shortfall was over 23 miles per gallon. [Table 7 can be found on p. 27 of Docket number NHTSA-2010-0131-0166-A1] [NHTSA-2010-0131-0166-A1, p. 7]

Ninety-four percent of the 50 most fuel efficient non-hybrid 2012 model year passenger cars (Table 8) were more than 10 miles per gallon short of their 2025 model year target. The average shortfall was over 15 miles per gallon. [Table 8 can be found on p. 28 of Docket number NHTSA-2010-0131-0166-A1] [NHTSA-2010-0131-0166-A1, p. 7]

Collectively, the 2012 model year data clearly demonstrates that the proposed targets cannot be achieved at the costs assumed by the Agency or with conventional technology. [NHTSA-2010-0131-0166-A1, p. 7]

Applying the technology already present in the 2012 model year mileage guide to the Agencies projected penetration rates result in a sizable shortfall to the proposed standards. Even using the best available hybrid technology in the market today, a manufacturer would have to have a penetration rate of over 70% hybrid electric vehicle and 3% electric vehicles to achieve the proposed standards. This is substantially higher than the rates projected by the Agency. [See Table 2 on p. 8 of Docket number NHTSA-2010-0131-0166-A1] [NHTSA-2010-0131-0166-A1, pp. 7-8]

---

7 Wind power is the fastest developing source of energy in the United States and can be an important part of the solution to climate change. However, wind farms can kill birds through collisions with turbines and associated structures, and also harm them through the loss of habitat that birds need for survival. A 2008 Department of Energy report calls for the U.S. to generate 20% of its electricity from wind by 2030. By then, wind turbines are expected to be killing at least one million birds each year, and probably significantly more, depending on the final scale of wind build-out. Wind farms are also expected to impact almost 20,000 square miles of terrestrial habitat, and over 4,000 square miles of marine habitat by 2030, some critical to threatened species. (American Bird Conservancy)

10 Comparisons are to gasoline counterpart similar to consumers’ purchase decisions; the proposal counts fuel savings from the fleet average and does not use a comparable vehicle as the basis for fuel saving.

11 The Agency values the battery at about $4000; requiring over 150,000 miles of additional driving to pay back; Honda also lists the battery at about $4000

12 Defined as having a breakeven mileage in excess of 300,000 miles

Organization: Ferrari

We believe that it is right to propose now a CAFE regulation that covers the entire 9-year period MYs 2017-25, but it is necessary to make a mid-term review, to verify the consistency of the proposed standards, due to the many uncertainties that are implicit in the technical and economic assumptions that form the basis for the proposed standards. In case of any changes or mores\ stringent requirements, enough lead-time should be allowed. It is important for vehicle manufacturers to have clear and stable regulations, and enough lead-time before they are first adopted or modified. [EPA-HQ-OAR-2010-0799-9535-A2, p.14]

Organization: Ford Motor Company

The standards that have been proposed by EPA and NHTSA through the 2025 model year represent the most significant federal action ever taken by the US federal government to improve fuel economy and reduce greenhouse gas emissions – nearly doubling the standards that were in place for the 2010 model year. To meet these requirements throughout the 2017-2025 period, substantial capital investments will be necessary to meet consumer demand for more fuel-efficient vehicles, to incorporate new technologies that consumers want, and to compete against other automakers in the marketplace. Some examples of the major planned investments include converting three truck and SUV plants to build small cars, re-tooling our powertrain facilities to manufacture fuel-efficient EcoBoost engines, offering more advanced six-speed transmissions, leveraging our global platforms, increasing our hybrid offerings and production, and moving forward with an aggressive electrification strategy. [EPA-HQ-OAR-2010-0799-9463-A1, p. 8]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 33.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 86.]

The proposed rules extend through the 2025 model year, which is an unprecedented time frame in the context of fuel economy regulations. This presents a significant challenge for manufacturers. While the establishment of longer-term standards provides manufacturers with targets for future product planning and investment, the longer time frame leads to greater risk that the assumptions underlying the standards do not come to fruition. For example, if the lack of adequate infrastructure hinders the introduction of new fuel-saving technologies, or if fuel prices turn out to be substantially lower than anticipated, it might be necessary to change the standards in order to avoid damage to American auto jobs and the U.S. economy.

Organization: Growth Energy

The fuel economy and GHG standards proposed by the Agencies sent ambitious targets for the automobile industry. The standards and other requirements that the Joint NPRM propose, along with other safety and emissions programs, will determine how the U.S. automobile industry allocates its human and financial resources for the next decade. The new-vehicle market will determine whether the automobile industry's efforts to comply with the Agencies' GHG and fuel economy standards are successful. Greenhouse gas standards of the type being proposed by EPA are, for all practical purposes, fuel economy standards, and like fuel economy standards such standards affect nearly every attribute of vehicle design and performance, as well as vehicle retail and operating costs. One of the most ambitious aspects of the Joint NPRM is that it would set standards for the industry over a much longer time frame than any previous fuel economy standards established by NHTSA, including the model-year ("MY") 2012-2016 GHG standards recently promulgated by EPA. [EPA-HQ-OAR-2010-0799-9505-A1, p. 1]

Programs that try to force the market to purchase electric vehicles that the public does not want to buy require public subsidies, increases in the prices of conventional vehicles to subsidize the manufacturers' cost, or both. While California may have some discretion under the Clean Air Act to experiment with its own new-vehicle market, and while the Joint NPRM's approach may have the support of some stakeholders in addition to California, NHTSA and EPA have independent duties to determine whether the standards it adopts are economically practicable and take proper account of the state of technology, including the costs of technology. See 49 U.S.C. § 32902(f); 42 U.S.C. § 7521 (a)(2). If the reliance on electric vehicles is misplaced, because there is no statutory mandate for such vehicles in federal law nor any requirement that the Agencies rely on such vehicles in writing GHG or fuel economy standards, the proposed standards in the Joint NPRM need to be scaled back to conform to levels that are economically practicable and also technologically feasible after accounting for costs. [EPA-HQ-OAR-2010-0799-9505-A1, p. 2]

Organization: Haroldson, C.

The proposed standards are too strict [EPA-HQ-OAR-2010-0799-11137-A1, p. 1]

Organization: Honeywell International, Inc.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 257.]

The program should instead remain technology neutral and recognize all significant performance improvements.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 209-210.]

Manufacturers must have confidence in a regulatory approach to take the risks necessary to innovate and world's most pressing environment and energy security challenges. We believe that better regulatory approaches are performance-driven, technology neutral, and provide some flexibility, and they must reflect the best available data and signs incorporating the most up-to-date research and technical information.

Organization: Honeywell Transportation Systems

Honeywell strongly endorses a performance-based, technology-neutral approach to regulating emissions and fuel consumption. Honeywell believes that government policy should promote all technology in the same way. Even at the end of the MY 2025 timeframe, internal combustion engine vehicles will continue to dominate the new light duty fleet. Proven, cost-effective technologies that use the nation's current infrastructure and numerous breakthroughs in many internal combustion engine technologies will become available in the years ahead, substantially improving the environmental performance of the vehicle fleet. Yet those benefits could be lost or diminished if the government directs investment towards electric vehicles without simultaneously encouraging continued investment in advanced ICE technologies. [EPA-HQ-OAR-2010-0799-9474-A1, pp.1-2]

Although we recognize that the overall stringency of the regulations encourages investment and improvement throughout the fleet, it is also true that an OEM may gain significant compliance advantage from EVs and PHEVs -- a compliance advantage that would be further enhanced if the credit multipliers are finalized. Much of the technology utilized to obtain that advantage is limited to the battery technology so that the technological advancement does not necessarily transfer to other vehicles. [EPA-HQ-OAR-2010-0799-9474-A1, p.5]

Organization: Howard, P.

One thing I would like to see is that these standards only apply to newly manufactured vehicles and that there will be absolutely no provisions or punishments requiring people to get rid of their perfectly good and operating older vehicles. [EPA-HQ-OAR-2010-0799-10063-A1, p. 1]

Organization: Hrin, S.

It would be good for our national security if cars were required to get more miles to the gallon. I'm not talking about a few miles per gallon more, but much more. [EPA-HQ-OAR-2010-0799-1568, p.1]

I believe car makers should be required to get 100/gallon by 2025. Anything less would be a travesty. [EPA-HQ-OAR-2010-0799-1568, p.1]

Organization: Hyundai America Technical Center

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 22.]

In our discussions with the agencies on this rulemaking, we have consistently supported the standard in excess of 50 miles per gallon.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 24.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 23.]

Finally, Hyundai appreciates a substantial lead time for these regulations which will provide stability for long-term product planning.

Organization: International Council on Clean Transportation (ICCT)

The ICCT has two overall objectives for our comments. First, given the accelerating pace of technology development and cost reduction, the proposed standards are not pushing the limits of technology and it will not be difficult or expensive for manufacturers to meet them. Second, many cost effective technologies may not be adopted should the stringency be weakened due to unwarranted credits. Our comments are focused on ensuring that the final rule is as robust as possible, including data and information on technology and consumers and suggestions for improvements to the credits. [EPA-HQ-OAR-2010-0799-9512-A1, p. 2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 196.]

ICCT strongly supports the overall program stringency. However, we are concerned some cost-effective reductions may not be achieved due to certain elements found in the performance rule.

Organization: Jackson, F.W.

10. Equating a 54.5 mpgge average EPA proposal 'mix' to 54.5 mpgg vehicle performance, they are not interchangeable because the 'mix' vehicles need to consider each vehicles 'weight' while a 54.5 mpgge average implies no 'weighting'; e.g. to show the point, a 54.5 mpgge vehicle performance calcs to 1.835 gge to go 100 miles; whereas one 60 mpgge Volt and one 49 mpg HEV also average 54.5 mpgge but the 49 mpg uses 2.04 gg per 100 miles and the 60 mpgge uses 1.67 gge per 100 miles for 2 vehicles using 3.71 gge for 200 miles or an average of 53.9 gge, i.e., not 54.5. Clearly not equivalent. and the farther the vehicles are from the average the more impact, e.g., use one Leaf at 97 mpgge and one 12 mpg 'guzzler' and average is still 54.5 but 'guzzler' alone for 100 miles is by itself 8.33 gge! Then add the 1.03 gge for the Leaf for a 200 mile total of 9.36 gge, or per 100 miles 4.68 gge (21.4 mpgge), or 155% more gge than a 54.5 vehicle. While EPA ref 2 shows 6 vehicle mix scenarios, plug in penetrations minor in all 6, however the option for manufacturers to sell plug-ins to obtain credits and/or multipliers to allow more profitable 'guzzlers' is available and where profitable I expect the profit motive will prevail; yet in EPA's Ref. 2 scenarios I did not find a 2025 model year scenario with high plug-in penetration! [EPA-HQ-OAR-2010-0799-8041-A1, pp. 5-6]

---

2. EPA Draft Regulatory Impact Analysis 'Proposed Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards' EPA-420-D-11-004 November 2011

Organization: Manufacturers of Emission Controls Association (MECA)

The Manufacturers of Emission Controls Association (MECA) is pleased to provide comments in support of the U.S. EPA's proposed rulemaking to establish 2017 and later model year light-duty vehicle greenhouse gas emission standards and corporate average fuel economy standards.

We believe an important opportunity exists to significantly reduce greenhouse gas emissions and improve fuel economy from passenger cars, light-duty trucks, and medium-duty passenger vehicles. [EPA-HQ-OAR-2010-0799-9452-A3, p.1]

Controlling greenhouse gas emissions from the transportation sector is essential to the overall efforts to alleviate long-term impacts on the climate. As detailed in EPA's proposal, there are a large set of technology combinations that are available to reduce greenhouse gas emissions from passenger vehicles and light-duty trucks, including fuel efficient, state-of-the-art and future advanced gasoline and diesel powertrains. [EPA-HQ-OAR-2010-0799-9452-A3, pp.1-2]

In summary, there are significant opportunities to reduce greenhouse gas emissions from the transportation sector through the design of fuel efficient powertrains that include advanced exhaust emission controls for meeting even the most stringent criteria pollutant standards. MECA believes that advanced emission control systems have a critically important role in future policies that aim to reduce mobile source greenhouse gas emissions. These emission control technologies allow all high efficiency powertrains to compete in the marketplace by enabling these powertrains to meet current and future criteria pollutant standards. In nearly all cases, these fuel-efficient powertrain designs, combined with appropriate emission controls, can be optimized to either minimize fuel consumption impacts associated with the emission control technology, or, in some cases, improve overall fuel consumption of the vehicle. This optimization extends beyond carbon dioxide emissions to include other significant greenhouse gases such as methane, nitrous oxide, and black carbon. [EPA-HQ-OAR-2010-0799-9452-A3, p.6]

MECA commends EPA for taking important steps to reduce greenhouse gas emissions and improve fuel economy from light-duty vehicles. Our industry is prepared to do its part and deliver cost effective, advanced emission control technologies to the market. [EPA-HQ-OAR-2010-0799-9452-A3, p.6]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 180.]

MECA, like many commented already today, supports performance-based standards that are technology neutral.

Organization: Marlinghaus, E.

The stakes are too high. We must dramatically reduce our consumption of fossil fuels - imported or domestic - if we are to prevent catastrophic climate change. Although I support the proposed rule to increase fuel economy for new passenger vehicles to an average of 54.5 miles per gallon by 2025, personally I feel that the date for reaching this standard should be moved forward to at least 2020. [EPA-HQ-OAR-2010-0799-1581-A1, p. 1]

This spring, you set a goal of reducing oil imports by one-third this decade, and in November you proposed fuel efficiency standards that will effectively double current requirements. I commend your efforts, but urge you to set your goals even higher. I believe it is important to increase U.S. investment in fuel efficient technologies, save consumers money at the pump, help this country break its dependence on oil & all fossil/carbon based fuels, and most importantly, protect the environment. Do NOT let these standards be watered down--protect and finalize the new fuel efficiency rules. [EPA-HQ-OAR-2010-0799-1581-A1, p. 1]

Organization: Marshall, C.

Promulgating the standard might best be done by also implementing companion federal programs involving other agencies, e.g., a financing program allowing U.S. auto manufacturers to retool plants and re-train workers. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Organization: Mass Comment Campaign (10) (National Wildlife Federation Action Fund-1)

President Obama pledged to reduce our oil imports by one-third by 2025. Setting strong vehicle efficiency and emissions standards is the most effective, common-sense step we can take to reduce our dependence on oil. [EPA-HQ-OAR-2010-0799-1244-A1_MASS, p.1]

These standards would also deeply cut US global warming pollution, and help speed the adoption of technology domestically and globally to cut emissions even further. The deep cuts in oil use that result from setting the strongest standards are also critical to reducing the need to drill for oil in increasingly risky, environmentally destructive and higher emitting locations. [EPA-HQ-OAR-2010-0799-1244-A1_MASS, p.1]

From more advanced engines to stronger lightweight materials, automakers have the technology to reach standards of at least 60 miles per gallon by 2025 and achieve the President's goal. Strong standards would also spur American innovation to help our auto industry compete and thrive in a global marketplace, while helping households and businesses save money. [EPA-HQ-OAR-2010-0799-1244-A1_MASS, p.1]

The difference between the strongest and weakest standards you are considering would cost Americans $370 billion at the pump (with most of the money ending up outside of the U.S.), and add twice as much global warming pollution to the atmosphere. [EPA-HQ-OAR-2010-0799-1244-A1_MASS, p.1]

We need your leadership to set strong fuel economy standards that will break our dependence on oil, curb global warming pollution and provide consumers with more choices of fuel efficient our cars and trucks. [EPA-HQ-OAR-2010-0799-1244-A1_MASS, p.1]

Organization: Mass Comment Campaign (4,505) (Unknown Organization)

All but one of the alternative standards discussed in the rules would allow greenhouse gas emissions from cars and light trucks to increase through 2025; but dangerous climate change cannot be avoided unless greenhouse gases actually decrease. The rules should adopt the alternative that actually decreases carbon pollution every year through 2025. [EPA-HQ-OAR-2010-0799-9595-A1_MASS, p.1]

The rules do not push car makers to look for technological innovation; they allow manufacturers to simply rely on small improvements to technology that already exists. As a result even 13 years from now, in 2025, the U.S. fleet would still do no better than what some cars can already achieve today. By 2025 the United States should do better than the European Union, China and Japan, not continue to lag behind them. [EPA-HQ-OAR-2010-0799-9595-A1_MASS, p.1]

Organization: Mass Comment Campaign (61) (The Social Justice Group)

We, the undersigned, applaud the proposed 54.5 miles per gallon carbon and fuel efficiency standards for cars and light trucks. We urge you to maintain these strong standards and make them final in July of this year. [EPA-HQ-OAR-2010-0799-7406-A1_MASS, p.2]

Organization: Massachusetts Institute of Technology (MIT)

In our Report, we have shown that the proposed regulations are highly demanding on both technological and market deployment fronts. Strong coordinated policies in addition to stringent CAFE requirements will thus be required to incentivize aggressive development of greatly improved propulsion system and vehicle technologies as well as the rapid market penetration of that technology, along with increasing deployment of alternative vehicles and fuels, into actual use. [NHTSA-2010-0131-0229-A1,p.1]

We are submitting our Report titled “U.S. CAFE Standards: Potential for Meeting Light-duty Vehicle Fuel Economy Targets, 2016-2025” which we have prepared as our response to the joint NHTSA and EPA proposal for extending the U.S. National Program to further improve light-duty vehicle fuel economy and reduce greenhouse gas emissions, for model years 2017 through 2025. It is based on our research of the past year or so, using a forwardlooking stochastic fleet assessment model for analyzing the impact of uncertainly on projected future light-duty vehicle fuel use and greenhouse gas emissions (Bastani, P. Heywood, J.B., Hope, C., SAE paper 2012-01-0647, SAE 2012 World Congress, Detroit, MI), with appropriate assumptions for future average car and light-truck operating characteristics and sales volumes. [NHTSA-2010-0131-0229-A1, p.1] [[See Docket Number NHTSA-2010-0131-0229-A1, pp3-35 for the report.]]

We quantitatively analyze three different scenarios. First, we define an “operational space” within which we evaluate specific scenarios, using evolving upper and lower bounds on the assumed vehicle characteristics, sales volumes of each major technology, and anticipated travel demand. Within this context we show that:

1. With our “plausible yet ambitious” scenario, (see Bastani, P., Heywood, J.B., & Hope, C., Transportation Research Part A, vol. 46, pp. 517-548, 2012) the likelihood of exceeding the 2016 fleet average targets is moderate for passenger cars, but very low for the combined car plus light-truck new vehicle fleets. The prospects of meeting the 2025 targets with this scenario are extremely low. [NHTSA-2010-0131-0229-A1, p.1]

2. With a more optimistic scenario where, for example, vehicle performance remains unchanged (a significant departure from the history of the last two or so decades), the prospects for meeting the 2016 fleet targets with passenger cars rises to some 50% but for the combined cars and light

trucks sales are still only a few percent. The potential for the combined car and light truck sales meeting the 2025 targets on time is very low indeed. [NHTSA-2010-0131-0229-A1,p.1]

3. With the proposed EPA/DOT preferred alternative scenario, as spelled out in the proposed rule making, the prospects for meeting these targets are better: some 20% for the combined car and light truck fleet meeting the 2016 CAFE fleet-average targets, but still only about 15% for the 2025 targets. [NHTSA-2010-0131-0229-A1, p.1]

We hope that this probabilistic analysis with the logic behind its assumptions carefully explained (and referenced), with it's detailed results and findings, will prove useful to you in your deliberations of these proposed CAFE requirements. [NHTSA-2010-0131-0229-A1, p.2]

Organization: Mercedes-Benz USA, LLC

Despite this overall support, the continuing stringency increases in the proposal are extremely aggressive, especially for a company that traditionally sells in the luxury car market and with modest volumes over which to spread its compliance obligations. As more fully explained in the Attachment to this letter, DAG suggests the following additional flexibilities and provisions. These measures would assist companies in overcoming market barriers, bringing new and advanced vehicles to market and combining advancements in crash avoidance technology with the fuel consumption reduction and emissions benefits they produce: [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

The final regulation will impose a set of aggressive and challenging standards. As a technology leader, DAG will continue to employ in its fleet all available technological advancements and will gain real world CO_2 and fuel economy benefits through off-cycle technologies. DAG appreciates the opportunity to comment upon the proposal and looks forward to continuing to work with the agencies during finalization and implementation of the regulations. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-19]

• DAG supports establishing an alternative compliance pathway for companies to choose more stringent standards in the later model years to allow more lead time to diversify their U.S. product line-ups and to bring additional advance technology vehicles, such as fuel cell vehicles, to the U.S. market. [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

DAG supports a concept introduced in the proposal to provide an alternative compliance pathway to allow manufacturers additional lead time to reconstitute the light duty vehicle fleet. This suggestion was raised in the context of explaining that the agency would not extend the Temporary Leadtime Allowance Alternative Standard ('TLAAS'). The agency requested comments on whether the intermediate-volume, limited-line manufacturers should receive additional flexibility in the latter years of the proposal, and whether the phase-in should be spread over more years for lower volume manufacturers. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-1]

DAG understands the agency's decision not to extend the TLAAS beyond its original terms. However, DAG agrees that manufacturers be accorded an option to adopt an alternative compliance pathway. The alternative would reduce the grams per mile reduction requirements during earlier model years and then make up most, or all of those carbon reductions in later model years.[3] [EPA-HQ-OAR-2010-0799-9483-A1, p. A-1]

The alternative pathway would be available to all manufacturers. We anticipate, however, that most manufacturers, who are able to spread compliance costs across a broader fleet, would continue to choose the basic option since doing so would allow those manufacturers more consistency across model years. The alternative pathway would likely be utilized primarily by the small number of manufacturers with more concentrated product line-ups in order to diversify their U.S. market fleets and to bring more long-ranging advanced technology vehicles, such as fuel cell or dedicated CNG vehicles, to market. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-1-A-2]

DAG looks forward to discussing this option with the agencies and to developing an alternative compliance pathway that is likely to provide the necessary assistance while maintaining similar or equal overall levels of CO_2 reduction. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-2]

---

3 One possibility within the first four model years, MYs 2017-2020, would be to adjust the grams per mile reductions during the first two model years with corresponding increases in the latter two model years. Another possibility would be to spread the alternative pathway across the eight model years covered by the overall rulemaking.

Organization: Miller, P.

This rule should be moved to 2020 with an addition of a separate part which provides far more federal R&D for cars that don't use fossil fuels at all -- including hydrogen and advanced electric cars, funds for plug ins, etc. This would help global warming by reducing carbon emissions while it developed entire new industries that keep our energy dollars in the US = lasting industries. [EPA-HQ-OAR-2010-0799-1755-A1, p. 1]

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 42.]

And go to finally, NACAA urges that EPA and NHTSA ensure that this final rule is promulgated by July 2012 as planned, and encourages EPA upon promulgation of this rule to begin assessing the efficacy of another phase of standards to apply to post 2025 model year vehicles.

Organization: National Automobile Dealers Association (NADA)

These comments do not devote much attention to technological feasibility, largely taking on faith the proposal's assumptions in that regard. Likewise, little attention is paid to the proposal's assumptions regarding program benefits, except to stress that if and to the extent vehicles covered by the program rule are not sold and used as predicted, those benefits will be reduced. [EPA-HQ-OAR-2010-0799-9575-A1, p. 3]

The proposal seeks to establish CAFE and GHG mandates which would take effect with MY 2017. No statutory mandate requires that standards be set so far in advance, for so long a period of time. In fact, the 35.5 mpg standard recently promulgated for MY 2016 will kick in some four years earlier than Congress contemplated in EISA. [EPA-HQ-OAR-2010-0799-9575-A1, p. 11]

Absent a specific statutory direction, NHTSA and EPA should be guided by three principal factors. First, a timetable should be designed to provide adequate lead-time for manufacturers to achieve technologically feasible standards. Statutory language on lead-time is found in both the Energy Policy and Conservation Act and the Clean Air Act. CAFE standards must be issued at least 18 months prior to the model year in question and for no more than 5 model years. In addition, new GHG standards may not take effect sooner than the model year commencing 4 years after they are promulgated. Technological feasibility directly relates to what manufacturers can do and when they can do it. The longer out into the future standards are set, the less likely NHTSA and EPA will have credible information to accurately predict technological feasibility. This is one of the key lessons taught by the heavy-duty truck emissions look-back discussed above and found in Exhibit B. Setting standards too far in advance dramatically increases the risk that those standards will prove to be technologically infeasible. [EPA-HQ-OAR-2010-0799-9575-A1, p. 11]

Proposed standards also must be economically practicable. Although NADA has considerable confidence that vehicle manufacturers will be able to research, design, manufacture, and incorporate technologies and designs aimed to meet the proposed standards, serious questions exist regarding whether they will be able to do so in a cost effective or economically practicable manner. As discussed at length above, regulatory benefits will not attain unless and until vehicles subject to the proposal are bought. And, to the extent they prove unaffordable, they will not be bought. There are simply too many variables involved with the reasonable modeling of economic practicability to warrant the setting of standards unnecessarily too far in advance. Fuel costs, materials costs, general economic conditions, and interest rates are but a few of these very hard to forecast, yet critical variables. In short, NHTSA and EPA have no justification for setting standards for longer than the statutory five year period. [EPA-HQ-OAR-2010-0799-9575-A1, pp. 11-12]

Prospective light-duty vehicle purchasers, and the dealers who sell to them, will be directly impacted by the vehicle production mandates under consideration. If no rule were to issue, in-use passenger car and light truck fuel economy and GHG performance would continue to improve, as older, less fuel-efficient vehicles are replaced by newer ones offering comparable performance with improved fuel economy. NHTSA and EPA must preserve this trend by avoiding mandates which, through product compromises or high costs, would impede fleet turnover. [EPA-HQ-OAR-2010-0799-9575-A1, p. 13]

The automobile industry has traveled a steep technology path over the last century, resulting in astounding improvements to light-duty cars and trucks. Today's vehicles are lighter and more powerful, yet safer and more fuel efficient than ever in history. Fuel economy/GHG standards should encourage manufacturers to continue along this technology path, but only if it allows them to deliver to new vehicle showrooms products that are acceptable by and affordable to consumers. Future light-duty vehicles must be affordable up-front, and must also offer a total value package that includes fuel economy, but with no safety or performance trade-offs. Unless and until new vehicles sell, regulatory benefits will be unrealized. [EPA-HQ-OAR-2010-0799-9575-A1, p. 13]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 69.]

Secondly, NADA wants the highest fuel economy that we can get as long as the mandates are feasible and affordable as customers do have choices.

Organization: National Wildlife Federation (NWF)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 32.]

A recent survey by Consumers Reports found that 93 percent of the public is in support of stricter fuel economy standards. The public understands how the fuel standards work. They work for wildlife, they work for American families and they work for the auto industry and autoworkers and for the overall economy.

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

Annual Rates of Emissions Reductions

EPA's proposed rule would incorporate a carbon dioxide equivalent standard that requires annual average reduction rates of 5 percent for passenger cars and 3.5 percent for light trucks in model years (MY) 2017 to 2021 and 5 percent for all light-duty vehicles for MY 2022 to 2025. For reasons set forth herein and in our November 1, 2010 letter (attached), NESCAUM believes a 6 percent rate for passenger cars is technically feasible and economically practicable. We strongly encourage EPA to consider incorporating a more stringent rate of improvement in this rule.[EPA-HQ-OAR-2010-0799-9476-A1, p. 1]

EPA's technology analysis projects that battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) will account for as little as 1 percent of sales in 2021 and 3 percent of sales in 2025. EPA and the NHSTA previously estimated that a 6 percent annual rate of improvement for the combined passenger car and truck fleet could be achieved with as little as 4 percent combined sales share of BEVs and PHEVs in 2025, provided that sales of conventional hybrids continue to increase. Given the proposed rule initially establishes a less stringent standard for light trucks (3.5 percent reduction rate from MY 2017 to 2021), achieving a 6 percent reduction rate for passenger cars alone would likely require even lower penetration rates than EPA's previous estimates. The majority of major auto manufacturers will be selling BEVs or PHEVs as part of their offering of passenger cars, beginning with MY 2013. Forecasts of significant reductions in the weight and cost of electric vehicle technologies further support our conclusion that the modest increase in sales of these advanced technology vehicles required to achieve a fleet-wide 6 percent annual rate of improvement for passenger cars is viable.4 [EPA-HQ-OAR-2010-0799-9476-A1, pp. 1-2]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 70-74.]

The proposed rule before us today incorporates carbon dioxide emissions reduction at average annual rates in model years 2017 through 2021 of five percent for passenger cars and three point five percent for light trucks.

For model years '22 through 2025 the rate is set at five percent for all light-duty vehicles.

NESCAUM states continue to affirm our previous position that a six-percent rate is technically feasible and economically practical and encourage EPA to strongly consider incorporating this more stringent rate of improvement into the rule.

NESCAUM states encourage EPA to consider the six-percent annual rate of improvement.

---

4 MIT Energy Initiative. Electrification of the Transportation System. April, 2010.

Organization: RVIA

EPA and NHTSA should closely examine whether they have appropriately considered future light vehicle towing trends in setting standards for light duty passenger cars, cross-over vehicles, minivans and other vehicles that will be used more in the future to tow RV trailers and similar towable products. [EPA-HQ-OAR-2010-0799-9550-A2, p.5]

Organization: Smith, Frank Houston

Please note that the current 40 UK gasoline vehicle configurations rated >60 mpg(Imperial) combined are generally similar in size to the Fiat 500 or for two. This suggests something more than "advanced" gasoline ICE technologies are necessary to accomplish fuel economies above 45~50 mpg(US) combined for machines currently considered mid and compact sized light passenger vehicles in the US. [NHTSA-2010-0131-0240-A1, p.2]

Here are the 20 US vehicles that have broken the 50 mpg highway barrier since 1984: http://www.fueleconomy.gov/feg/Power...g=50&maxmpg=70 [NHTSA-2010-0131-0240-A1, p.2]

51~53 mpg - Chevy Sprinter ER 1986~1987

51 mpg - Chevy Sprint Metro 1988

52 mpg - Chevy Sprint Metro 1989~1994

51 mpg - Civic CRX HF 1986~1987

50 mpg - Civic HB VX 1994~1995

58~61 mpg - Honda Insight 2001~2006

A total of 20 vehicles in the last 28 years, with nothing post 2006. [NHTSA-2010-0131-0240-A1, p.2]

And, here are the only 11 vehicles recognized by http://www.fueleconomy.gov/feg/powerSearch.jsp to have achieved ≥ 50 mpg(US) combined since 1984:

50 mpg(US) combined - Toyota Prius C 2012 & Prius 2010 through 2012

52~53 mpg(US) combined - Honda Insight 2000 through 2006 [NHTSA-2010-0131-0240-A1, p.3]

Organization: Society of the Plastics Industry, Inc. (SPI)

SPI supports the aim to preserve consumer choice in vehicles, and likewise seeks for manufacturers to have a fully captured and incentivized range of technological options to reduce emissions and increase fuel efficiency. [EPA-HQ-OAR-2010-0799-9492-A1, p.2]

Organization: Susan R.

Please increase the minimum MPG. If auto makers will routinely offer vehicles that offer a 50+ MPG, the gas savings alone would pay for an upgrade in vehicle. PLEASE - for our environment and just plain common sense, increase the minimums! [EPA-HQ-OAR-2010-0799-10792-A1, p. 1]

Organization: Tarazevich, Yegor

There should be one target for everyone (by 2025 it will be CAFE 54.5 MPG which is equal EPA 40 MPG). Every new car that does not meet the target should pay a penalty of $500 per every MPG under the standard. If one wants to buy a huge 20 MPG gas guzzler he will pay a $10,000 penalty for air pollution and oil dependency. This is the only way to eliminate all loopholes. [NHTSA-2010-0131-0199,p.1]

Organization: Toyota Motor North America

The 163 grams per mile (54.5 miles per gallon equivalent) proposed standard for 2025 model year is truly groundbreaking and will provide significant environmental and energy savings benefits. While Toyota feels confident that our leadership in advanced technology vehicles provides a strong foundation, meeting the proposed standards poses a formidable challenge for our engineers and product planners. [EPA-HQ-OAR-2010-0799-9586-A1, p.2]

The overall level of the proposed standards in 2025 model year is consistent with the agreement signed by Toyota last July and the joint Supplemental Notice of Intent (NOI) published last August. These standards will pose a substantial challenge our engineers and product planners, but Toyota is prepared to make every effort to comply. [EPA-HQ-OAR-2010-0799-9586-A1, p.5]

Further, subject to specific comments provided later in this document, Toyota generally supports the added flexibilities proposed by EPA in the form of the following provisions: (1) sales multipliers for advanced technology vehicles; (2) unlimited transfer of credits between fleets; (3) A/C system leakage credits; and (4) one-time carry forward of 20102016 model year GHG credits through the 2021 model year. Unfortunately, NHTSA does not believe it can propose or adopt these same flexibility provisions for the CAFE regulations. To account for these differences, NHTSA has proposed to set the CAFE target curves at different (lower) 'MPGe' levels than EPA's GHG target curves for a given model year. However, Toyota's understanding is that NHTSA's target curves have only been adjusted to account for the lack of sales multiplier and A/C system leakage credits in the proposed NHTSA regulations, while no adjustments have been made to account the lack of unlimited credit trading and one-time carry forward in the proposed NHTSA regulations. The result of this difference in flexibility is a difference in .stringency between the programs. Granted, the one-time carry forward is a temporary flexibility that has no impact beyond 2021 model year, so the long-term effect of this difference is less material. However, the difference in credit trading and transferring is a significant and long-term (fixed) difference that substantively affects stringency. [EPA-HQ-OAR-2010-0799-9586-A1, pp.5-6]

We request that the agencies further evaluate this potential stringency gap and take measures to address this gap, either through increased flexibility in the NHTSA program or by adjusting the NHTSA curves to account for the difference in stringency. [EPA-HQ-OAR-2010-0799-9586-A1, p.6]

Organization: Union of Concerned Scientists (UCS)

(a) Overall Stringency & Technical Feasibility

In the proposed rule, EPA presents standards yielding a projected fleetwide greenhouse gas average of 163 g/mi in model year 2025. NHTSA is proposing a harmonized CAFE standard yielding a projected fleet average of 40.9 mpg in MY2021 and 49.6 mpg in MY2025 – due to its statutory limitations requiring rulemakings no longer than five model years. While the proposed standards represent significant progress, the technology exists to establish even more stringent standards consistent with the agencies' statutory obligations. [EPA-HQ-OAR-2010-0799-9567-A2, p. 5]

The agencies' original TAR laid out four scenarios ranging from a 3-6% annual reduction in greenhouse gas emissions. As stated in our original comments to the NOI, the data continue to support a 6% annual reduction (143 g/mi in MY2025) as technically feasible and increasing the net societal benefits as demonstrated by our joint technical analysis with the Natural Resources Defense Council that has already been submitted to the docket. [EPA-HQ-OAR-2010-0799-9567-A2, p. 5]

Current market conditions reflect that more stringent standards are achievable. According to UCS analysis, 39 models sold today – including conventional, hybrid, and advanced technology – are already sold in a version that meets their MY2017 proposed targets. Of these models, nearly two dozen meet the target for MY2020.26 An analysis in the Draft Joint Regulatory Impact Analysis confirms these findings, and identifies another 33 nameplates sold today that nearly meet their MY2017 targets, missing them by five percent or less.27 These data, as well as the agencies' data on technology potential, indicate that higher stringencies should be set – particularly in the light-truck fleet, where the proposed annual rate of improvement is exceedingly weak for large footprint models. We provide further detail regarding our concerns on the light truck standards in Section II(b) below. [EPA-HQ-OAR-2010-0799-9567-A2, pp. 6-7]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 215.]

UCS urges the agencies to finalize strong vehicle standards with the attention paid to susceptible provisions in the proposal that if exploited by auto makers would reduce the programs anticipated benefits.

---

19 Union of Concerned Scientists. Comments Concerning EPA's and NHTSA's Notice of Intent to Conduct a Joint Rulemaking, 2017 and Later Model Year Light Duty Vehicle GHG Emissions and CAFE Standards. November 3, 2010. p. 4 [EPA-HQ-OAR-2010-0799-9567-A2, p. 5]

26 http://blog.ucsusa.org/the-future-is-now-39-models-meet-tomorrow%e2%80%99s-fuel-economy-requirements-today

27 Draft Joint Regulatory Analysis, Table 3.12-1

Organization: United Automobile Workers (UAW)

The UAW believes strongly that the proposed regulations are sensible, achievable and needed. They are good for the auto industry and its workers, good for the broader economy, good for the environment and good for our national security. Adopting the proposed rules will give an additional boost to the ongoing revitalization of the auto industry, and for those reasons we recommend adoption of these proposals in the final rules. Thank you for considering the views of the UAW on these important issues. [EPA-HQ-OAR-2010-0799-9563-A2, p.8]

Organization: Van Coppenolle, J. and L.

The need for stringent vehicle performance standards is critical. Vehicles are a major cause of poor air quality and adverse climate conditions, and the larger the vehicle, the greater the effect. [EPA-HQ-OAR-2010-0799-1284-A1, p. 1]

1) The higher standards do not apply to all vehicles across the board, allowing automakers a potential loophole if they decide to reclassify cars as SUVs, pick up trucks, etc., which have lower proposed standards. [EPA-HQ-OAR-2010-0799-1284-A1, p. 1]

2) The new standards take effect only in 2017, though automakers are fully capable of implementing them far sooner than that. The effective date should be moved forward, to 2015 at the very latest. Please do not allow automakers to deceive you into believing they cannot meet an earlier deadline. [EPA-HQ-OAR-2010-0799-1284-A1, p. 1]

Please revise the standards so that the highest ones apply to all vehicles and they take effect within the next three years. [EPA-HQ-OAR-2010-0799-1284-A1, p. 1]

Organization: Volkswagen Group of America

Volkswagen provided a framework of what we believe to be an achievable and balanced regulatory program aimed at advancing environmental and energy objectives while maintaining market feasibility and customer acceptance. In general Volkswagen put forward a concept for a regulation with equitable CO_2 reductions amongst all segments and sizes of vehicles. We combined this with broad incentives targeted at advancing interest by consumers into more efficient, lower emitting vehicles. We further proposed incentives to promote use of bio-based fuels which would help drive low emitting technology into vehicles while also advancing the goals of the US Renewable Fuels Standards. [EPA-HQ-OAR-2010-0799-9569-A1, letter p. 2]

Volkswagen remains predominantly a passenger cars manufacturer. We believe that cars offering a balanced mix of premium features, advanced safety, and invigorating dynamics can deliver a first order reduction in CO_2 emissions versus other common choices made for daily consumer use. [EPA-HQ-OAR-2010-0799-9569-A1, letter p. 2]

The SNOI and subsequent NPRM outline an aggressive advancement of CO_2 emission targets. However Volkswagen disagrees with details of the framework, primarily the imbalanced distribution of burden and the inclusion of targeted, segment and technology specific incentives. As such, we were not in a position to endorse the proposal as did many of our industry counterparts. Instead, Volkswagen will offer within these comments a suite of proposals aimed at improving the overall balance of the proposal. [EPA-HQ-OAR-2010-0799-9569-A1, letter p. 2]

Volkswagen markets a broad range of fuel efficient passenger cars and light trucks in the US. We understand the importance of increasing fuel economy with standards that are:

- Aimed at reaching aggressive environmental targets

- Achievable with an assortment of conventional and advanced technology

- Flexible and feature a broad package of flexibility

- Most importantly, affordable for consumers [EPA-HQ-OAR-2010-0799-9569-A1, p. 3]

We are committed to continually offering fuel efficient vehicles, such as the new mid-size, clean diesel Passat TDI, available to the U.S. market.

- Built in our new LEED Platinum Certified factory in Chattanooga, TN

- Passat TDI achieves 43 mpg highway and can travel almost 800 miles on a single tank of fuel

- Volkswagen anticipates that over 30% of our customers will select the fuel-saving TDI Passat [EPA-HQ-OAR-2010-0799-9569-A1, p. 3]

In addition, Volkswagen continues to develop vehicles featuring a broad array of fuel saving technologies. It is our overall goal to offer a competitive suite of market viable technologies for our customers to choose from. We recognize that a full range of affordable technologies and vehicles will be needed to fit the diverse needs of our customers. [EPA-HQ-OAR-2010-0799-9569-A1, p. 3]

Volkswagen actively engaged with the agencies at a technical level to provide estimates of future emissions reduction and fuel economy technology. During this time, Volkswagen outlined a series of key principles to help define a balanced regulatory program for 2017+. However, following our review of the 2010 Supplemental Notice of Intent (SNOI) and subsequently the Notice of Proposed Rulemaking (NPRM), Volkswagen was concerned that the proposed regulation contained elements which would eventually produce an unbalanced, inequitable rule. [EPA-HQ-OAR-2010-0799-9569-A1, p. 3]

Organization: Volvo Car Corporation (VCC)

VCC believes that the current classification framework, the footprint attribute, and the footprint cut-points are reasonable and should be retained. Moreover, any changes to these fundamental elements of the program could have a major impact on the stringency of the standards themselves, and would require extensive reevaluation. [EPA-HQ-OAR-2010-0799-9551-A2, p. 12]

Response:

The majority of comments received on the topic of the stringency of the standards were supportive, with many commenters noting that the standards are challenging but achievable, and will result in significant reductions in GHG emissions and significant fuel savings. Comments on the topic were also received requesting modifications to the stringency of the proposed standards, either increasing or decreasing the year-to-year reduction in target emissions, and either increasing or decreasing the lead time provided for manufacturers to adopt new technologies. A detailed description of the selection of the curve shapes, stringency, and alternatives considered are provided in sections II.C, III.B.2, and III.D.6 of the preamble, and section 2.5.3 of the joint TSD. These sections contain detailed responses to most of the comments received on the topic of stringency and curve shape, while a summary of these responses, along with additional information, is provided below.

Response to comments that standards should be more or less stringent

EPA considered standards that were less stringent and more stringent than those adopted. The analysis of technology penetration rates and costs of these alternative standards is described in section III.D.6 of the preamble. EPA believes the final standards are preferable to the more stringent alternatives based on considerations of cost – both to manufacturers and consumers – and the potential for exceeding feasible penetration rates with sufficient lead-time for advanced technologies, especially given the unknown degree of consumer acceptance of both the increased costs and of the technologies themselves. EPA's analysis of more stringent alternatives as set out in section III.D.6 of the preamble, which encompass the alternatives suggested by commenters, supports these conclusions. At the same time, EPA believes the final standards are preferable to the less stringent alternatives EPA examined, given that the final standards provide significant reductions in GHG emissions and save consumers significant fuel – and thereby, money – that far exceed the costs. These benefits would be foregone with less stringent standards.

ACEEE stated that the alternative standards demanding higher penetration rates of advanced technologies are preferable because "[t]hese alternatives adhere to technology penetration rates that fall within the caps set by EPA to ensure feasibility." EPA agrees with the observation, but disagrees that this (by itself) is a justification for increasing the stringency of the standards. This is because EPA believes that ACEEE has misinterpreted the purpose of the technology caps, which are discussed in detail in chapter 3.4.2 of the joint TSD and section III.D.6 of the preamble. As a modeling tool, EPA imposes upper limits on the penetration rates allowed under our modeling. These maximum penetration rates are intended to account for the physical limits of technical capability in light of conditions such as supplier capacity, up-front investment capital requirements, manufacturability, and other factors. While they may reflect technical judgments about technology feasibility and availability, consumer acceptance, lead time, and other factors, these caps are not meant to imply that rates below that cap are *a priori* practical or reasonable. That so many manufacturers are pushing up against those limits for the alternative standard advocated by the commenter raises legitimate issues of not only lead time and cost, but consumer acceptance as well.

ACEEE further commented that EPA did not take into account the various proposed flexibilities, such as credits for plug-in vehicles and hybrid credits for large pickups. EPA has certainly considered carefully the role of incentives and flexibilities for advanced technologies versus adopting standards predicated on wide-scale use of those technologies. We explained in sections III.C.3 and III.D.6 of the preamble that there is a legitimate policy decision to be made regarding whether to potentially jeopardize much of the rule's benefits due to lack of consumer acceptance of trucks with advanced technologies (for example due to cost, or discomfort with power train electrification on hauling vehicles). EPA has reasonably chosen instead to adopt aggressive standards which nonetheless do not force such technologies' use as sharply but rather promote penetration of these technologies by means of incentives and flexibilities. We note the comments of the U.S. Coalition for Advanced Diesel Engines, among others, which documented the low rates of penetration of hybridization in large footprint trucks in the current fleet as evidence of a lack of consumer demand for these technologies. We note further that we have incorporated the credits for use of hybrid technologies on pickup trucks into the OMEGA modeling (see preamble section III.D.5). Our analysis shows that on a fleet-wide basis, the impact of these pickup truck flexibilities in 2025 is small, as shown in Table III.2 of the preamble. Therefore, EPA believes it is reasonable to rely on incentives, rather than rely exclusively on potentially overly-aggressive standards, to obtain market penetration of these potentially game-changing technologies.

Some commenters (CBD, J. Capozzelli, Mass Campaign) expressed concern that the standards will not result in an overall reduction in greenhouse gas emissions over the rulemaking timeframe. However, CBD's observation that "[t]he alternative the Agencies prefer would continue to increase greenhouse gas emissions through 2025" is incorrect. EPA believes that the commenters incorrectly read Table 5.4.1-2-B of the DEIS, which shows that even when future projected VMT growth is accounted for, net greenhouse gas emissions from light-duty vehicles are reduced under the preferred alternative through 2040. As shown in Table III-60 in the preamble, without these standards, overall emissions from light-duty vehicles in the U.S. would increase from 1,100 MMTCO2 eq. per year in 2010 to 1,600 in 2050. In the analysis conducted for this rule, total light-duty vehicle emissions in 2050 are calculated to be reduced by 569 MMTOCO2 eq. per year, as shown in Table III-61. This will result in total light-duty vehicle emissions of 1,031 MMTCO2 eq. per year in 2050 – a reduction from the 2010 level.

CBD, a mass comment campaign, and several individuals commented that these standards are not as stringent as certain other standards internationally, specifically those in the European Union, Japan, and China. EPA notes that the standards in this rule are not directly comparable to foreign fuel economy or emissions standards because 1) the standards are based on a footprint attribute whereas foreign standards are based on other attributes, 2) the measurement test cycles are different than foreign standards, and 3) the composition of each country's vehicle fleet reflects the unique consumer preferences and vehicle usage patterns of that country. Regarding the last point, as a result of differences in consumer preference and vehicle usage, the fleet make-up in other nations is quite different than that of the United States. These regions cited by the commenters have a large fraction of small vehicles (with lower average weight, and footprint size) when compared to vehicles in the U.S. Also the U.S. has a much greater fraction of light-duty trucks. When looked at from a technology-basis, with the exception of the existing large penetration of diesels and manual transmissions in the European fleet – there is no unique technology in the European and Japanese markets which leads to lower fleet-wide CO2 emissions. The commenters have not provided any detailed analysis of what technologies are available in these regions which EPA is not considering – and indeed, there are no such “magic” technologies. The vast majority of the differences between the current and future CO2 performance of the Japanese and European light-duty vehicle fleets are due to differences in the size and current composition of the vehicle fleets in those two regions – not because EPA has ignored technologies which are available for application to the U.S. market during the rulemaking time frame.

CBD commented that more stringent standards are possible, stating “it is clear that 69 mpg by 2025 is technically feasible 14 years from now. Indeed, it is beyond question that a fleet-wide average of 62 mpg (representing approximately a 6% annual increase) can be achieved based mostly on existing, off-the-shelf technologies …”. CBD went on to advocate that the agencies adopt the most stringent alternative from the DEIS, which would require a 7 percent annual increase for the car and truck fleets. UCS proposed more stringent standards of 6 percent for cars and trucks, while NESCAUM proposed higher stringency for the car standard only, stating that they believe “a 6 percent rate for passenger cars is technically feasible and economically practicable”. In support of its position, CBD cited as evidence two of the most efficient vehicles currently available (the Toyota Prius and the Nissan Leaf). EPA agrees that technologies are currently available that will enable significant reductions in fuel use and emissions under this rule. However, EPA does not agree, as the commenter suggests, that feasible improvements in smaller footprint cars are representative of gains that can be achieved in a cost-effective manner by all vehicles, noting that this rule promulgates standards for manufacturers’ fleets which consist of a wide range of vehicles and footprints.

In the analysis conducted for this rule, among the alternatives considered were Alternatives 2 and 4, both of which have higher stringencies than the standards being finalized by this rule. While EPA believes that the technology penetration required for these more stringent alternatives are, in the narrow sense, technically achievable, they were not selected. EPA explains in detail in sections III.D.6 and 7 of the preamble to the final rule that our analyses have shown that increasing the stringency beyond the promulgated levels would add significant cost with diminishing additional benefit, and for light trucks, potentially leading to overly aggressive penetration rates of certain advanced technologies, raising issues of lead time, costs, and consumer acceptance, as well as creating incentives to comply by reducing vehicle utility. As explained in section III.D.6.d of the preamble, the more stringent alternatives we considered would affect penetration rates of MHEVs, HEVs, EVs, and PHEVs, especially in MY2025. Alternative 4, which would require a similar increase in car stringency to the NESCAUM’s proposed 6 percent, would lead to penetration rates of 7 percent for PHEVs and EVs, and much higher penetration (up to 45 percent) for some individual manufacturers, as shown in Table III-54 of the preamble. The UCS and CBD proposals for 6 and 7 percent increases, respectively, for both cars and trucks would be more stringent than both Alternatives 2 and 4 considered by the EPA, with correspondingly higher penetration of PHEVs and EVs. These increases in technology penetration rates raise serious concerns about the ability and likelihood manufacturers can smoothly implement the increased technology penetration in a fleet that has so far seen limited usage of these technologies. While this is more pronounced for 2025, lead time issues would also exist for MY 2021 and earlier years. As such, EPA has not made changes to increase or decrease the overall stringency across the car and truck fleets from the levels of the proposal, as advocated by these commenters.

CBD also expressed concern that agencies have "selected standards that value purported consumer choice and the continued production of every vehicle in its current form over the need to conserve energy: as soon as increased fuel efficiency begins to affect any attribute of any existing vehicle, stringency increases cease." EPA disagrees with this comment. It is important to note that the standards do not apply to individual vehicles, so that manufacturers can produce, and consumers can purchase, vehicles with attributes that differ from those of existing vehicles. Furthermore, in evaluating the costs of the rule, the agencies have included costs to preserve vehicle utility (see EPA RIA 1-40) but have not "ceased … increases in stringency" in the face of those costs. Indeed, were the commenter correct, the standards for cars and trucks would not increase in stringency at all, much less in each model year. Furthermore, EPA acknowledges that multiple pathways exist for manufacturers to come into compliance. One way is through the reduction of some vehicle attribute. That attribute may be content, acceleration performance, hauling, towing, all wheel drive, NVH, ride height, etc. However, EPA has not captured these options in the analysis as we are showing compliance choosing pathways through the addition of technology that maintain these consumer desirable attribute(s). A more detailed response to CBD's comment is provided in the introductory portion of section III.D of the preamble.

Several commenters referred to an "SUV loophole" in expressing their concern that these standards will encourage the production of more trucks, thereby diminishing the benefits of the rule (CBD, J. Capozzelli, J. and L. Van Coppenolle). EPA disagrees with these comments. As discussed in section III.D.6 of the preamble and section 2.2.2 of this document, EPA believes the car and truck curves appropriately reflect the differences in cost between the car and truck fleets for adding efficiency technologies. Moreover, intentional "gaming", whereby a manufacturer modifies a design so that a car can be reclassified as a truck, comes at significant cost to the manufacture, with added production and component costs, and to the consumer in the form of reduced fuel savings and a higher purchase price. Therefore, EPA does not agree that manufacturers will shift production to trucks as a result of this rule.

EPA recognizes that a challenge faced by manufacturers of luxury vehicles will likely be higher compliance costs than other manufacturers. BMW commented that the "significant penetration of these advanced conventional technologies in our existing fleet will make it even more challenging for BMW to achieve compliance." However, compliance challenges should not be interpreted to mean that the standard is unreasonable or infeasible. Furthermore, EPA recognizes that each manufacturer's unique combination of vehicle types, sizes, and previously adopted technologies may result in variation among manufacturers in the technologies available for achieving compliance and their associated costs. EPA notes that some of this variation is the result of product decisions made by the manufacturers to offer consumers additional vehicle features and enhanced attributes, such as higher engine power. Some of the variation also reflects that these manufacturers for years paid fines (or civil penalties) in lieu of compliance with CAFE standards and now have further improvements to make to attain the same level of control as other manufacturers. See 75 FR at 25414. In the analysis conducted for this rule, and described in section III.D.6 and 8 of the preamble and chapter 3.4.1 of the RIA, we considered that manufacturers have already adopted, to varying degrees, some of the advanced technologies that will enable emissions reductions, and demonstrate that a feasible compliance path exists for all manufacturers.

ECM commented that "achieving carbon neutrality through tailpipe emission standards is not within the realm of possibility". EPA notes that the objective of this rule is not to achieve "carbon neutrality", but rather to reduce GHG emissions through technology-based standards, while considering issues of technical feasibility, cost, and available lead time, as discussed in section I.A.1.b of the preamble. See Coalition for Responsible Regulation v. EPA, No. 09-1322 (D.C. Cir. June 26, 2012) slip op. p. 43 (in setting section 202 (a) standards, EPA is not required to adopt standards that mitigate a specific quantum of the endangerment caused or contributed to by vehicular GHG emissions). Nevertheless, in the context of the standards in this rule, ECM's observations about some of the obstacles to the development of low-carbon technologies for electricity generation are still relevant. However, the availability of these electricity generation technologies will not have a major impact on a manufacturer's ability to comply with the standard. EPA's Integrated Planning Model (IPM) predicts that only a small fraction of the incremental electricity generation will come from renewable sources in 2030, as described in section III.C.2.c.vi. Furthermore, EPA's analysis shows that manufacturers will be able to achieve compliance with relatively modest penetrations of PHEV and EV technologies. At the same time, EPA recognizes that the accelerated development of low-carbon electricity sources will result in emissions reductions beyond what are projected by the analysis for this rule.

EPA does not agree with the comments that the proposed targets cannot be achieved primarily through improvements in gasoline ICE technologies (Frank Houston Smith) or that MY 2012 fuel economy and purchase price data show that "the proposed targets cannot be achieved at the costs assumed by the Agency or with conventional technology" (ECM). As described in section III.D.8 of the preamble, a significant number of MY 2012 vehicles achieve or surpass targets for MYs 2017-2022. The compliance pathways for each manufacturer set forth in section III.D.6 of the preamble likewise are predicated largely on improvements to internal combustion engines, indicating that 'conventional technology' compliance pathways are not only feasible, but expected. Additionally, further advancements in technology are likely that will enable more manufactures to adopt technologies that currently exist, but are not yet implemented in full production, for compliance in the latter years of the rulemaking. For this reason, EPA does not agree with ECM's conclusion that, as evidenced by the low number of MY2012 vehicles that comply with MY2025 standards, the standards are not achievable using conventional technologies. In the latter years of the rule making, vehicle designs will certainly be different from those of today, and manufacturers are expected to adopt additional technologies as a result of this rule – indeed that is the primary mechanism of a technology-based standard.

We also disagree with ECM's statement that compliance will require a "penetration rate of over 70% hybrid electric vehicle and 3% electric vehicles". According to our technology penetration analysis, HEVs, PHEVs, and EVs will comprise only 7 percent of the fleet in MY2025, while diesel engines will comprise less than 1 percent, as shown in Table III-52 of the preamble and Table 3-25 of EPA's RIA. Finally, we do not believe that most of major vehicle manufacturers would support the standards if basic feasibility was at issue. See, e.g. Comments of the Alliance quoted above ("Given that many of our member companies support the standards as proposed….").

ECM also argued that the agencies underestimated the costs of the rule, and provided their own calculations for payback periods for selected hybrid and diesel vehicles. As noted above, our technology penetration analysis concludes that compliance for these standards can be achieved primarily through the adoption of technologies applied to internal combustion engines, such as turbo downsizing. In cases where more advanced technologies are applied, we do not believe the MSRP values used by the commenter in these calculations accurately represent the actual costs that will be paid by consumers, now or in the future. For example, while the commenter assumes a cost of $7000 for hybrid technology, EPA reasonably has estimated a cost of $2,861 for a midsize car in MY2025 (in 2010 dollars, see Table III-23). This basis for this estimate is set out in detail in joint TSD section 3. 3.3.6. Furthermore, as discussed in section III.H.5 of the preamble, although payback analysis in this rule considers the average number of vehicle miles traveled per year, in reality, drivers who travel more than average will incur fuel-related savings more quickly, and therefore, the payback will come sooner. For these reasons, EPA does not agree with the commenter's assertion that a long payback period for efficiency technologies for some drivers will present an obstacle to their adoption.

Several private citizens commented that the standards are too stringent, while the environmental and regional planning organizations mentioned above and private citizens requested that the NPRM stringency be increased. As stated earlier, EPA believes that the final standards will result in significant reductions in GHG emissions and fuel savings at a reasonable cost, and are preferable to the more stringent alternative standards EPA considered (which bound the ranges of more stringent standards requested by commenters), taking into account costs, manufacturer lead time, product development cycles, and consumer acceptance. See Preamble sections III.D.6 and 7 for more details.

<u>Response to comments that lead time is too long or too short</u>

EPA's analysis of the technologies that will enable manufacturers to achieve the emissions reductions required by this rule includes technologies that are either currently commercially available, or (for a few technologies) projected to be commercially available during the rulemaking timeframe. EPA agrees with comments expressing support for the lead time and period covered by this rule (ACC, CFA, Ecology Center, Ferrari, Hyundai), and those commenters who noted that the rule provides a reasonable amount of time for manufacturers to plan for and implement technologies for reducing emissions (CFA, Consumers Union, Ecology Center).

A number of commenters noted that the long lead time and number model years covered by this rule will provide a level of certainty that will allow manufacturers to plan and adjust future product. While EPA agrees with these commenters, we also recognize the difficulty of forecasting consumer preferences into the future (Mitsubishi, Suzuki, Chrysler, NADA[1]), and the greater uncertainty in the assumptions used for future production planning and investment (Ford, Global Automakers) that arise from the longer lead time covered by the rules. The mid-term evaluation is planned as the chief mechanism to address uncertainties like those noted by the commenters, and at that time, EPA will evaluate the assumptions upon which the rules are based.

Mercedes-Benz proposed an alternative compliance pathway, which would reduce the emissions target levels in early years of the rule, and make up most or all of the reductions in later years. EPA agrees that flexibility is an integral part of the standard setting in order to help manufacturers phase-in technologies given their typical redesign schedules. In this rule, these flexibilities are provided, in part, through the Averaging, Banking, and Trading Provisions (ABT) described in detail in section III.B.4 of the preamble. These ABT provisions achieve the aim of the commenter, which is to provide additional lead time as necessary without reducing the GHG emissions reductions and fuel savings benefits of the rule. For example, ABT provides three year credit carry-back provisions which allow a manufacturer to run a deficit and cover that deficit with future credits (i.e., carry back credits to a previous year). This is conceptually very similar to the alternative pathway approach suggested by the commenter. Therefore EPA, believes that additional flexibilities are not justified.

Porsche, Jaguar Land Rover, and Suzuki raised concerns about feasibility and adequate lead time for intermediate volume, limited line manufacturers. As discussed in section III.B.6, EPA is providing intermediate volume manufacturers with additional lead time to meet the principal standards in response to these comments.

Response to other comments on stringency

RVIA suggested that the agencies "closely examine whether they have appropriately considered future light vehicle towing trends in setting standards…". EPA agrees with the commenter that towing is an important attribute for many consumers, and notes the technology penetration and cost analyses for this rule were all conducted with the underlying requirement that vehicle utility be maintained. EPA believes that there is no contradiction between the adoption of certain efficiency technologies to reduce GHG emissions, and the preservation of other vehicle attributes, such as towing capability. For example, turbo-downsizing can be adopted without reducing performance, as evidenced by the MY2012 Ford F150, for which the optional 3.5L EcoBoost® V6 has a higher maximum towing capacity than the 5.0L V8.

EPA appreciates the work done by the faculty and students of MIT, and their probabilistic analysis of the impact of uncertainty on projecting fuel use and GHG emissions. We recognize the importance of considering uncertainty, and for that reason conduct sensitivity analyses, which is described in chapters 3.11, 4.5, and 8.1 of the EPA RIA.

[1] NADA cited the 2007/2010 heavy-duty emissions rule as an example of how setting standards with a long-lead time can cause difficulty in estimating costs. A detailed response to this comment is provided in chapter 18.2 of this document.

EPA agrees with the suggestion of the Alliance of Automobile Manufacturers to "examine [the] approach to adjusting the curves for year-over-year stringency." As discussed in sections II.C.4 and III.D.7 of the preamble, we plan to review the estimation and selection of the target curves during the mid-term evaluation. We also plan on reviewing the fleet data as it becomes available: this includes footprint distribution, technology content, safety, changes in attributes (such as acceleration performance), credit balances etc. to determine what strategies manufacturers are employing to come into compliance with the standards.

2.2.2. Car and Light Truck Footprint Curve Shapes and Level of the Standards

Organizations Included in this Section

American Council for an Energy-Efficient Economy (ACEEE)
American Honda Motor Co., Inc.
Anonymous Public Citizen 1
Association of Global Automakers, Inc. (Global Automakers)
Capozzelli, J.
Center for Biological Diversity
Chrysler Group LLC
Consumers Union
Ford Motor Company
General Motors Company
Institute for Policy Integrity, New York University School of Law
Insurance Institute for Highway Safety (IIHS)
International Council on Clean Transportation (ICCT)
Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)
Mass Comment Campaign (375) (Union of Concerned Scientists-2)
Mass Comment Campaign (4,505) (Unknown Organization)
Mass Comment Campaign (9,570) (Unknown Organization)
National Association of Clean Air Agencies (NACAA)
Natural Resources Defense Council (NRDC)
Nissan North America, Inc.
RVIA
Salinas, A.
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Smith, Frank Houston
South Coast AQMD
Toyota Motor North America
Union of Concerned Scientists (UCS)
United Automobile Workers (UAW)
Volkswagen Group of America
Weiner, L.
Whitefoot, K. and Skerlos, S.

Organization: American Council for an Energy-Efficient Economy (ACEEE)

We do have concerns regarding the structure of the proposed rule, especially its lenient treatment of large light trucks in the early years and the resulting increase in the slope of the light truck target curves. Below we provide comments and recommendations on these issues, among others. While we take issue with a few aspects of the analysis, on the whole the process and the analysis were thorough, transparent, and well documented. [EPA-HQ-OAR-2010-0799-9528-A2, p.1]

The concluding argument regarding the superiority of the proposed standard (NPRM p.75084) is not compelling, and Table III-53 begs the question of how the compliance cost differential between cars and trucks in 2017-2020 can be justified. This concern would presumably be amplified by further disaggregation, showing that in fact incremental costs for large trucks are negligible in those years. The proposal appears to favor (in the near term) manufacturers with disproportionate production of large trucks during those years. EPA should show compliance costs by manufacturer, not just for 2021 and 2025, but for all years. The small improvements required of large trucks in 2017-2020, followed by a larger improvement in 2021 is of particular concern given the agencies' plan to conduct a midterm evaluation. This situation raises the possibility that the more significant improvements proposed for large trucks in the period 2021-2025 will never be realized, because manufacturers may allow technology development for these vehicles to stagnate in the early years of the rule and use this to influence the outcome of the midterm evaluation. [EPA-HQ-OAR-2010-0799-9528-A2, p.8]Shape of the Light Truck Target Curves

An issue of particular concern in the proposal is the lenient treatment of large light trucks. In 2017-2020, emissions reductions required of the heaviest light trucks are small. This reflects the agencies' recognition of "manufacturers' technical concerns regarding their abilities to comply with a similarly shallow curve after MY2016 given the anticipated mix of light trucks in MYs 2017–2025." We have not, however, been able to find a clear technical explanation of the justification for these concerns, or of the approach taken, in the proposed rule or in related documents. [EPA-HQ-OAR-2010-0799-9528-A2, p.3]

The agencies refer to the possibility of compromising load-carrying and towing capability of full-size pickups (NPRM p.74915), but neither evidence nor quantification of such a problem is provided. Similarly, section 2.4.2.2 of the TSD discusses the decision to increase the slope of the light truck curve at length, yet the justification remains unclear. The agencies' methodologies for generating the curves and for simulating manufacturers' compliance strategies are quite capable of taking into account any such constraints to the extent that they actually exist. The agencies do explain that the aggregation of models in some cases results in treating non-towing vehicles as towing vehicles, and vice versa; but this appears to apply mostly to smaller vehicles, and certainly not to the large pickups that have prompted the agencies to increase the slopes of the target curves. [EPA-HQ-OAR-2010-0799-9528-A2, p.3]

The agencies also state: "Flatter standards (i.e., curves) increase the risk that both the weight and size of vehicles will be reduced, compromising highway safety" (NPRM p.74915). What the agencies have proposed, however, is to increase the slope of the truck curve, relative to what it would have been using the curve-fitting approach used for MY2012-2016. We do not believe, and presumably the agencies do not believe, that the curves in the rule now in place are dangerously flat. [EPA-HQ-OAR-2010-0799-9528-A2, p.3]

Technical basis for curve / rate of improvement

The approach to selecting the target curves in the current proposal deviates from the approach used for the 2012-2016 rule in several respects that substantially alter the relative stringencies of small truck and large truck standards. The most significant change is that the agencies have adjusted the technology-corrected data points for “density”, i.e., weight-to-footprint ratio. This results in a steeper slope for the light truck curve, because pickup trucks, and in particular the large pickups that dominate the high end of the footprint spectrum, have low densities due to their flat beds (TSD p.2-17). Adjusting the data to reflect this means that large pickup data points are pushed up vertically on a footprint vs. emissions/consumption curve to reflect the higher weight (and hence higher fuel consumption) that would be expected based on the footprints of those trucks. [EPA-HQ-OAR-2010-0799-9528-A2, p.3]

The rationale offered for this adjustment is as follows: “The agencies agree with manufacturers of full-size pick-up trucks that in order to maintain towing and hauling utility, the engines on pick-up trucks must be more powerful, than their low ‘density’ nature would statistically suggest based on the agencies’ current MY2008-based market forecast and the agencies’ current estimates of the effectiveness of different fuel-saving technologies” (TSD 2043). This suggests that the reference fleet, after all available gasoline technologies have been added, is incorrect and shows unrealistically low pickup truck fuel consumption, due to the overstatement of the benefits of certain technologies. If that is the case, the agencies should revisit the adjustments made to generate the reference fleet and remove technologies from pickups that are not suited to those trucks. This would be a far more satisfactory approach than the speculative and non-quantitative approach of adjusting for vehicle density. [EPA-HQ-OAR-2010-0799-9528-A2, pp.3-4]

Indeed, it is important to note that the fuel consumption trend that the density adjustment is meant to correct appears in the unadjusted fleet as well as the technology-adjusted fleet of light trucks (TSD Figures 2-1 and 2-2). That is, the flattening of fuel consumption at higher footprints is not a byproduct of unrealistic technology adjustments, but rather a reflection of actual fuel economy trends in today’s market. That being the case, adjusting fuel consumption of “low-density” trucks upwards before fitting the curve simply does not make sense. It is also puzzling that the agencies’ analysis shows that trucks’ HP-to-weight ratio increases only slightly with footprint (TSD p.2-17), yet “pick-up trucks must be more powerful, than their low ‘density’ nature would statistically suggest.” If pick-up trucks have high horsepower and low weight, their HP-to-weight ratios should be especially high. An explanation of this apparent contradiction would be helpful. [EPA-HQ-OAR-2010-0799-9528-A2, p.4]

The agencies explored a similar adjustment to the curve to reflect increasing HP-to-weight ratios, but did not adopt it. This adjustment is effectively the approach used to develop weight-based CO_2 targets in the EU and results in flatter curves (Mock 2011). In the EU, the adjustment was made to ensure that the standards do not provide an incentive to increase vehicle weight. In the U.S., the agencies’ decision not to apply this correction in the proposed rule yields steeper curves than the alternative choice, as does the decision to apply the correction for density. Both help to ensure that the proposed curves will provide an incentive to upsize vehicles. [EPA-HQ-OAR-2010-0799-9528-A2, p.4]

After adjusting the data based on density, the agencies fit lines to the adjusted data. This process differs from that used for MY2012-2016 rule, in that the data is sales-weighted and the fit uses an ordinary least squares (OLS) method instead of minimum absolute deviation (MAD). In that case, the agencies were “concerned that the steeper curves resulting from weighted least-squares analysis would increase the risk that energy savings and environmental benefits would be lower than projected, because the steeper curves would provide a greater incentive to increase sales of larger vehicles with lower fuel economy levels” (MY2012-2016 TSD p.2-13). That concern remains valid for the current rulemaking. While we agree with the agencies’ position that either method of fitting is technically sound, we note that in this NPRM, the agencies have consistently made choices that have the effect of increasing the slopes of the light truck curves, namely to adjust for density and not to adjust for HP-to-weight ratio, as well as to alter the curve-fitting method, as just mentioned. [EPA-HQ-OAR-2010-0799-9528-A2, p.4]

Large truck cutpoint

The problems created by increasing the slope of the truck curve are aggravated by the decision to move the right-hand cutpoint (i.e., the point at which the curve becomes flat) out to 74 square feet, up from 66 square feet in the MY2012-2016 rule. Not only will targets be less stringent for large trucks than they should be, but also the target emissions will continue to rise with truck footprint well beyond the point at which they flattened out in the MY2012-2016 rule. [EPA-HQ-OAR-2010-0799-9528-A2, p.4]

In the MY2012-16 rule, the agencies rejected the requests of auto manufacturers to raise the right-hand truck cutpoint from 66 square feet: [EPA-HQ-OAR-2010-0799-9528-A2, p.4]

The agencies also disagree with comments by the Alliance and several individual manufacturers that the cut-off point for light trucks should be shifted to 72 square feet (from the proposed 66 square feet) to ease compliance burdens facing manufacturers serving the large pickup market. Such a shift would increase the risk that energy and environmental benefits of the standards would be compromised by induced increases in the sales of large pickups, in situations where the increased compliance burden is feasible and appropriate. Also, the agencies‘ market forecast suggests that most of the light trucks models with footprints larger than 66 square feet have curb weights near or above 5,000 pounds. This suggests, in turn, that in terms of highway safety, there is little or no need to discourage downsizing of light trucks with footprints larger than 66 square feet. Based on these energy, environmental, technological feasibility, economic practicability, and safety considerations, the agencies conclude that the light truck curve should be cut off at 66 square feet, as proposed, rather than at 72 square feet. (2012-2016 Final Rule p.25363) [EPA-HQ-OAR-2010-0799-9528-A2, pp.4-5]

Yet this time, the discussion of policy considerations in developing the target curves includes the following: “If cutpoints are adopted, given the same industry-wide average required fuel economy, moving large-vehicle cutpoints to the right (i.e., down in terms of fuel economy, up in terms of CO_2 emissions) better accommodates the unique design requirements of larger vehicles—especially large pickups—and extends the size range over which downsizing is discouraged." (NPRM p.74915). While the agencies note that they had previously "underestimate[d] the impact of the different pickup truck model configurations above 66 square feet on manufacturers' fleet average fuel economy and CO_2 levels" (NPRM p.74919), this is unrelated to the sound reasons they had previously offered for keeping the cutpoint at 66 feet. In particular, they previously noted that there is no safety-related reason to discourage downsizing of these large trucks. Indeed, given that vehicle compatibility is a major determinant of the severity of two-vehicle crashes, reducing the size and weight differential across the vehicle fleet should be a priority to improve highway safety. Thus, for environmental, energy, and safety reasons, the final rule should restore the 66 square foot cutoff for MY 2017-2025. [EPA-HQ-OAR-2010-0799-9528-A2, p.5]

Potential consequences of lenient standards for large light trucks

The agencies seek comment on whether their adjustments to the slope of the target curves "may encourage changes other than encouraging the application of technology to improve fuel economy and reduce CO_2 emissions" (TSD 2-27). The weakness of the standards at the large footprint end of the light truck spectrum not only will result in a direct loss in GHG reductions relative to what would have been saved with a uniform five percent annual emissions reduction across all classes, but also runs the risk of pushing production towards that larger end. Such a shift raises safety concerns as well. This concern applies across all large light trucks, including SUVs, even though difficulty in reducing emissions at a higher rate was alleged for large pickups only. According to agency projections (NOI TAR Appendix), pickups will account for only one-quarter of large truck sales in MY 2025. [EPA-HQ-OAR-2010-0799-9528-A2, p.5]

A recent analysis appearing in the journal *Energy Policy* concludes that the curves defining fuel economy standards for MY2011-2016 already create an incentive for upsizing, and as a result it will likely increase vehicle emissions by 5-15 percent (Whitefoot and Skerlos 2011). This analysis found that, assuming "consumer preferences for vehicle size, fuel efficiency, and acceleration performance are all at their midpoints," the slope of light truck curve for MY 2014 would need to be reduced by ½ to avoid promoting vehicle upsizing. This result suggests that the proposed light truck curve for 2025, for example, will provide a strong incentive to upsize and will lead to major losses in benefits for the program. In order to avoid this outcome, the curves for 2025 and earlier years would need to be much flatter. Figure 1 shows the MY2014 light truck target curve and the flatter curve (dotted blue) that the Whitefoot and Skerlos analysis indicates would be necessary to avoid upsizing. The red curves represent the proposed MY2025 targets and a curve (dotted red) scaled down from the adjusted MY2014 curve, which could reasonably be taken to approximate the slope necessary to avoid upsizing in 2025. The difference in slopes between the two 2025 curves is very large. [EPA-HQ-OAR-2010-0799-9528-A2, p.5] [For Figure 1 please refer to EPA-HQ-OAR-2010-0799-9528-A2, p.6]

The integrity of the analytical basis for the standard depends upon a clear and consistent basis for the treatment of all vehicles. In the case of large light trucks, we find that i) the deviations from the analytical approach previously adopted are not justified with data provided in the NPRM, and ii) the resulting ad hoc adjustments to the curve-fitting process detract from the agencies' argument for their proposals. Thus, in addition to reducing the fuel and GHG savings that the rule will bring, the weakening of standards for large light trucks undermines the technical foundation for the rule going forward. The treatment of this issue in the NPRM and related documents unfortunately gives the impression that the analytical components of the development the target curves are subjective and can be used to justify a very wide range of outcomes. Introducing this degree of subjectivity to the technical analysis invites unnecessary challenges to the standard-setting process. [EPA-HQ-OAR-2010-0799-9528-A2, p.6]

Regardless of whether the agencies change the truck curve in the final rule, we believe that adjusting the analytical approach to yield curves satisfying certain policy considerations is inadvisable. It would be preferable to choose the most robust analytical approach, and then to make exceptions as needed for a limited period to accommodate those policy considerations, and to explain the targets in those terms. [EPA-HQ-OAR-2010-0799-9528-A2, p.6]

Inflating the slope of the truck is counterproductive from a policy perspective as well. The domestic auto industry owes its strength today in part to its having been induced by the federal government to improve fuel economy, which in turn has enabled it to better compete with the other manufacturers. These same domestic manufacturers, by demanding lenient treatment for a subset of their products, are repeating their earlier mistake and will suffer the consequences in the long run of slowing technological improvement of their large light trucks. [EPA-HQ-OAR-2010-0799-9528-A2, p.6]

We strongly support the agencies' plan to revisit the choice of curve-fitting options in the final rule (TSD p.2-44). [EPA-HQ-OAR-2010-0799-9528-A2, p.6]

Recommendations

- Do not apply the density adjustment to the reference fleet data before fitting the light truck curve. If necessary to ensure that towing and hauling capability is maintained, revisit the process of adding technologies to the reference fleet to ensure that only technologies consistent with the functional requirements of the vehicle are added.
- Starting in 2017, apply the same annual percentage reduction to light trucks as to cars. Restore the 66 square foot cutoff for MY 2017-2025 (Figure 2, dotted green).
- If no such changes are possible in the final rule, introduce a provision to ensure the standards do not promote upsizing as follows: once sales of light trucks of 66 square feet and above in a given year reach MY 2008 sales of pickups 66 square feet and above, the upper bound for the light truck targets should be fixed at the 66 square foot target (Figure 2, dotted purple). This would ensure that automakers do not increase sales volume at this end by producing lower cost, inefficient vehicles. [EPA-HQ-OAR-2010-0799-9528-A2, pp.6-7] [For Figure 2 please refer to EPA-HQ-OAR-2010-0799-9528-A2, p.7]

Organization: American Honda Motor Co., Inc.

Honda is concerned that the relative stringency between small footprint light trucks and large footprint light trucks diverge dramatically from one another, and the stringency increases fall disproportionately on the smaller foot-print light trucks. One example is comparing the Omega package 807 and with package 1804. [See table on p. 1 of Docket number [EPA-HQ-OAR-2010-0799-9489-A1] [EPA-HQ-OAR-2010-0799-9489-A1, p. 1]

These similar technology packages respectively are applied to a small footprint light truck and a large footprint light truck. While the 2021 costs of these two package sets are relatively similar, with the cost/1% CO_2 reduction and flat costs both slightly higher for the smaller light truck, the increased stringency of the standards for these two vehicles are significantly dissimilar. A small footprint light truck such as the Honda CR-V (footprint of 44 square feet) has a proposed increased stringency of 18%, while a large truck, like a Ford F150 (footprint of 72.8 square feet) has a proposed increased in stringency of less than 5%. [EPA-HQ-OAR-2010-0799-9489-A1, p. 1]

This pattern repeats elsewhere within the light truck category, all showing that the stringency increases are falling disproportionately on small light trucks like the Honda CR-V and its competitors. [EPA-HQ-OAR-2010-0799-9489-A1, p. 2]

As noted above in #1, above, the stringency for the larger footprint light trucks is very low, compared to the smaller footprint light trucks. The combination of the lower stringency and the “game changing” credits cannot be justified as a matter of science, in furtherance of social goals and objectives or as a matter of simple fairness and equity. Not only are large footprint pick up trucks required to do very little (no stringency increase for a number of years), they are overly rewarded if they do increase their performance: in other words, required to do nothing, and highly rewarded for doing something. [This comment can also be found in section 5.1 of this comment summary.] [EPA-HQ-OAR-2010-0799-9489-A1, p. 2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 119-120.]

EPA and NHTSA propose for the 2017 to 2025 periods to radically alter the light-duty truck curves from their '12 to '16 slopes. The agencies have proposed dramatically increased stringency for the smaller footprint truck and little or no stringent increases for the larger footprint trucks. Honda previously shared data with the agencies indicating that if any change were to be made to the curves, it was more appropriate to flatten out the curves or moderate the increase in stringency for the smaller footprint trucks and to increase the stringency for the larger trucks. In other words, Honda believes that smaller light trucks are being unfairly singled out for increases in their standards, especially compared to the larger vehicles. This obvious -- this is obviously because the smallest trucks will have an annual increase of around 4 percent while the largest truck will have an annual increase of less than 1 percent.

Subsequent to the publication of the NPRM, on December 7th, 2011, the University of Michigan issued a study by Whitefoot and Skerlos. Honda agrees with their conclusion. And I'm quoting: 'In the near term, the analysis suggests that the slope of the function determining fuel economy targets based on vehicle footprint should be flattened for both passenger cars and light trucks and even further for light trucks.

Additionally, the agencies' own data show this to be true. Simply looking at the EPA's and NHTSA's estimates for the compliance cost differences between passenger cars and trucks, both agencies estimate lower compliance costs for trucks than passenger cars, and this is primarily due to an imbalance in the light truck slope and a much more stringent burden being placed on the lower sales volumes of the smaller light trucks and little to no additional stringency being put on the larger light trucks.

EPA and NHTSA believe that full-sized pickup trucks have unique challenges in improving fuel economy and GHG emissions due to payload and towing requirements. Honda believes that vehicles other than full-size pickup trucks should receive similar consideration in preserving their utility. SUVs and minivans, for example, are often fully loaded by families resulting in expectations or coming from expectations of 7- or 8-passenger seating capabilities while maintaining payload and towing functionality. Similarly situated vehicles ought to be treated the same.

Organization: Anonymous Public Citizen 1

Close the loophole for SUVs. This rule will be only very mildly effective without that loophole being closed. [NHTSA-2010-0131-0231, p.1]

Organization: Association of Global Automakers, Inc. (Global Automakers)

A. Lower “cutpoint” of light truck standard curve

We note that the lower “cutpoint” of the truck standards curve is set at the same footprint point (41 square feet) as the passenger car standard. In our view, it would be more appropriate to set that cutpoint at the same sales point (i.e., representing approximately 10 percent of sales) as the passenger car curve. In this way, the same portion of the respective fleets would fall within the flat portions of the footprint curves. The same arguments advanced by the agencies in support of the selection of the lower cutpoint of the passenger car curve apply as well to trucks (small market segment, minimal incentive to downsize, possible disincentives for manufacturers to offer small vehicles if the curve continues to slope downward at the low end). See 76 Federal Register (FR) 74919. We believe that this change should be made for consistency of methodology and that it should have minimal impact on the standards for light trucks. Therefore, we recommend that EPA and NHTSA incorporate this change in the final rule. [EPA-HQ-OAR-2010-0799-9466-A1, p. 2]

Organization: Capozzelli, J.

The proposed rules allow light trucks to increase their fuel efficiency at a much slower rate than cars. For many years; this problem led automakers to build bigger vehicles so they could take advantage of these weaker standards, which caused efficiency standards in the United States to stagnate. We should not make the same mistake twice, and should strengthen the standards for light trucks on par with cars. We cannot afford to skew the rules in favor of gas-guzzling SUVs. [NHTSA-2010-0131-0221-A1, p.1]

Organization: Center for Biological Diversity

In setting maximum feasible fuel economy standards, Congress instructed NHTSA to prescribe separate standards for passenger and non-passenger vehicles based on one or more vehicle attributes related to fuel economy and to express each standard in the form of a mathematical function.40 In the NPRM, the Agencies set forth separate targets based on vehicle size, or footprint. Using a projected make-up of the nationwide fleet, NHTSA estimates the average fuel efficiency for passenger cars and light trucks in each model year (MY).41 [EPA-HQ-OAR-2010-0799-9479-A1, p. 8]

[See Table 1 on p. 8 of Docket number EPA-HQ-OAR-2010-0799-9479-A1] [See Table 2 on p. 9 of Docket number EPA-HQ-OAR-2010-0799-9479-A1]

The fleet-wide fuel economy standards actually achieved in any year, however, depend on each individual manufacturer's choice of vehicles and production volume. Once a manufacturer determines its models and production volume for a MY, fuel economy standards for that manufacturer are determined using the attribute-based formula of the fleet that has been built during the year; every manufacturer must meet only the fuel economy standard that correlates to its own fleet mix. Because manufacturers control the size and number of the vehicles they produce, their choices also control their fuel economy targets, and the aggregate choice of all manufacturers determine the actual fleet-wide fuel economy achieved in any one year. [EPA-HQ-OAR-2010-0799-9479-A1, p. 9]

The proposed standards substantially and improperly favor light trucks, particularly the largest and least fuel efficient trucks, and they provide an economically compelling incentive to upsize vehicle footprint. Because the NPRM, without a backstop, creates a system that incentivizes manufacturers to produce larger, less fuel efficient vehicles, the Agencies' mileage projections – especially over a time span of a decade and a half – are likely to be wrong. These errors must be corrected in the final rulemaking. [EPA-HQ-OAR-2010-0799-9479-A1, p. 9]

1. The proposed increases for light trucks are back-loaded rather than ratable, contravening Congressional intent [EPA-HQ-OAR-2010-0799-9479-A1, p. 9]

As the tables above demonstrate, the standards the Agencies propose to set for light trucks are dramatically less stringent than the standards for passenger cars. While passenger cars' efficiency increases by 4.3% annually, the increase for light trucks is only 2.9%. In addition, the light truck standards increase at a significantly slower rate than the passenger car rate.44 Together, the minimal increases for light trucks for the first four years of the covered period and the overall decreased stringency exacerbate the historical "advantage" enjoyed by SUVs and pickup trucks, delay gains in fuel efficiency for the overall fleet, and incentivize gamesmanship and an ever-increasing SUV loophole. [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

Title 49 U.S.C section 32902 requires NHTSA to prescribe "annual fuel economy standard increases that increase the applicable average fuel economy standard ratably." 45 "Ratably" is defined as "in a proportional, well-proportioned or proportionate manner."46 In other words, the statute requires not only that fuel efficiency increase every year, but also that it do so proportionally. The legislative history of the provision demonstrates that Congress intended fuel economy standards to "make rapid and consistent annual progress."47 In requiring "ratable" increases, Congress sought "relatively consistent proportional increases in fuel economy standards each year."48 [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

Flatly contravening Congressional intent, the Agencies have proposed inconsistent, slow, and disproportionally small average fuel economy increases for light duty trucks during the first years of the covered period. They propose a mere .6 mpg average increase per year from 2017 through 2020. As further discussed below, this disproportionality is exacerbated by the fact that the heaviest "light" trucks are required to increase their fuel efficiency by the least amount. The increase then jumps to 2.1 mpg in 2021, a near four-fold increase, and stays in a higher range for the remaining rulemaking period – not coincidentally, the period when of time the Agencies propose for a de novo rulemaking review, an event that presents another chance for industry to convince the Agencies that the higher standards during the latter period of the rulemaking must once again be watered down. 49 These proposed average increases are neither rapid and proportional when compared to the increases proposed for passenger cars or to the later rulemaking period [see Tables 1 and 2] nor consistent given the sudden jump in 2021. The total percentage increase for trucks also is not consistent or proportional with the increase for passenger cars. Rather, light cars and trucks will be left even further behind passenger vehicles. The Agencies' own interpretation of "ratable" contradicts their proposed treatment of light trucks. They interpret "ratable" to mean that "annual increases should not be disproportionately large or small in relation to each other." Yet the Agencies propose minimal annual increases for the first part of the rulemaking, followed by a three- to four-fold jump after 2021. Rather than being rapid, consistent or proportional, the proposed light truck increases are overwhelmingly backloaded into later years. [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

The effect of allowing minimal efficiency increases early and demanding larger increases later is only to delay efficiency gains that could be achieved much sooner, at a much lower price. As we have frequently stated (see our comments to the DEIS), because greenhouse gases remain in the atmosphere for centuries and their warming effect is delayed for decades, it is essential to decrease their emissions as soon as possible; the benefits of avoiding the emission of a ton of carbon today by far exceed the benefits of avoiding the release of the same ton of carbon several years from now. The Agencies recognize this to some extent as they increase the social cost of carbon over time (though insufficiently so). Conversely, remedial efforts get more expensive the longer action is delayed. Even setting aside the triggering of catastrophic events by crossing tipping points and assuming arguendo that the social cost of carbon grows by no more than the Agencies currently assume, it is undoubtedly vastly preferable to remove a given ton of carbon in year 1 rather than year 4, when it has wrought that much more damage. From the CAFE perspective, something similar can be said: the longer vehicles retain the same, rather than increased, fuel efficiency standards, the more fuel, a finite commodity that Congress mandates must be conserved, is wasted. Thus, the Agencies' failure to comply with the Congressional mandate to devise ratable fuel efficiency increases, and its decision to backload achievable gains instead, has the additional pernicious effect of increasing the rulemaking's cost. [EPA-HQ-OAR-2010-0799-9479-A1, p. 11]

The Agencies seek to justify the anemic annual rate of improvement for trucks by referencing the "unique challenges in improving the fuel economy . . . of full-size pick-up trucks, while preserving the utility of these trucks." Specifically, they explain that due to characteristics such as 4WD and towing and hauling capacity, "the vehicles in the current light truck fleet are generally less capable of achieving higher fuel economy levels as compared to vehicles in passenger car fleet." While this reasoning may address the fact that stringency for trucks is currently lower than that of cars, it does nothing to explain the lack of the required ratable annual increases – i.e., increases that are proportional, lead to rapid and consistent progress, and do not create incentives to upsize cars to light trucks and lighter trucks to heavier ones. [EPA-HQ-OAR-2010-0799-9479-A1, p. 11]

In any event, the explanation lacks merit. Studies show that trucks are indeed capable of maintaining towing and hauling capacity with higher fuel economy standards.53 The claim that the "unique challenges" faced by trucks justify a slower and disproportional increase in fuel economy standards, or any of the other regulatory leniencies the Agencies provide for them in the NPRM, fails in light of the fact that technologies exist that fully enable trucks to improve fuel efficiency while retaining utilities like hauling and towing. [EPA-HQ-OAR-2010-0799-9479-A1, p. 11]

The Agencies also cite cost concerns as a reason for setting lower stringencies for trucks than for cars. This justification does not withstand scrutiny. It ignores that U.S. manufactured light truck models have been the most profitable vehicle for manufacturers since 1990. 54 Moreover, in general, because small cars cost almost as much as large cars to design, build and distribute, small cars generate small gross margins, while light trucks earn manufacturers greater profit.55 Ironically, the rulemaking demands the least from the most profitable segment of the automotive industry. This result is arbitrary and capricious, and contrary to law. [EPA-HQ-OAR-2010-0799-9479-A1, p. 11]

The Agencies further reason that the different standards for passenger cars and trucks will preserve consumer choice and "should not affect consumers' opportunity to purchase the size of vehicle that meets their needs."56 As discussed above, although the Agencies can consider consumer demand, "it would clearly be impermissible for NHTSA to rely on consumer demand to such an extent that it ignored the overarching goal of fuel conservation."57 The Agencies here have elevated purported consumer choice for larger, heavier, less efficient vehicles over energy conservation and thus violated Congressional intent. Moreover, this choice, improper in itself, cannot justify overriding the Congressional mandate to set fuel efficiency standards that increase ratably every year. As discussed below, manufacturers created consumer demand to use larger, less efficient, and more profitable light trucks as passenger vehicles,58 and a wide range of consumer options exist in this category. Consumers who desire to purchase the most fuel efficient and least polluting vehicles, on the other hand, are left with far fewer options, and the U.S. is left in last place in passenger vehicle and light truck fuel economy. [EPA-HQ-OAR-2010-0799-9479-A1, p. 12]

We note here the Agencies' assertion that the NPRM "will not create significant incentives to produce vehicles of particular sizes, and thus there should be no significant effect on the relative availability of different vehicle sizes in the fleet due to the proposed standards, which will help maintain consumer choice during the rulemaking timeframe." This assertion is insupportable. Lower efficiency standards for trucks have caused their manufacture and sale to balloon for decades, and these differences would be exacerbated by the proposed rule, which goes so far as to demand almost no increases of the most inefficient and polluting vehicles in the fleet. The fact that incentives for upsizing would be created simply cannot be disputed. The Agencies come close to admitting this fact: "[A] steeper slope [in compliance curves] relaxes the stringency of targets for larger vehicles relative to those for smaller vehicles, thereby shifting relative compliance burdens among manufactures based on their respective product mix." Indeed. And a further shift to the least efficient vehicles in the fleet is inevitable. [EPA-HQ-OAR-2010-0799-9479-A1, p. 12]

Moreover, we strongly disagree with the Agencies' belief that their regulatory efforts should have no effect (and have no effect) on consumer choice or market forces that drive auto sales in general. It is EPCA and EISA's very purpose to change those forces toward the conservation of energy. And, in the context of their safety discussion, even the Agencies admit that, "[f]or full size (i.e. 3/4- and 1-ton) pickups, risk increases as mass increases." Thus, the more heavy vehicles are built, the more risk. Far from having no effect on consumer choice and market forces, the NPRM proposes regulations that will create the market forces that drive increased production of the least energy efficient vehicles on our highways. [EPA-HQ-OAR-2010-0799-9479-A1, pp. 12-13]

Creating different (and for some years, next to no) efficiency standards for the heaviest trucks also plays havoc with the footprint-based attribute system the Agencies have, until now, staunchly defended. Tellingly, the Agencies admit as much – they state that they had rejected allowing different standards for light pickup trucks based on different attributes, such as power, because doing so would introduce' multi-attribute standards' that the Agencies had "judged . . . to be more subject to gaming than a footprint-only standard." Influenced by industry comments, they abandoned that previously-held line in the sand because the "challenges faced by manufacturers of large pickups currently outweigh[] these prior concerns." As shown above, however, the "challenges" allegedly facing these most profitable and least energy efficient vehicles in the fleet are bogus. If abandoning the footprint-based attribute system to create this loophole was a price for the "agreement" between the regulators and the regulated in July 2011, it was too high a price to pay. [EPA-HQ-OAR-2010-0799-9479-A1, p. 13]

The minimal increases proposed by NHTSA become even more problematic when combined with carry-forward credits. Congress allows manufacturers to utilize credits earned after model year 2010 for five subsequent years.63 There is a 1.5 mpg credit cap for model year 2017, and a 2 mpg credit cap for model years 2018 and beyond.64 Given the small increases proposed here, the amount of credit that can be carried forward by manufacturers is now greater than the average estimated increase for light duty trucks for the first years of the covered period. Accordingly, manufacturers with credits available from efficiencies obtained from other automobiles can use these credits to avoid implementing *any* fuel saving technologies on certain trucks with larger footprints. [EPA-HQ-OAR-2010-0799-9479-A1, p. 13]

Congress intended that use of credits "not in any way reduce the oil savings achieved by the standards set for any year."65 Light duty trucks, and particularly the largest trucks within this sector, consume the highest amounts of fuel. Setting minimal increases that can be satisfied with available credits provides a disincentive for manufacturers to design more fuel efficient trucks and runs counter to statutory mandates. [EPA-HQ-OAR-2010-0799-9479-A1, p. 13]

The Agencies' decision to backload increases in fuel efficiency for trucks – as well as for passenger vehicles, though to a lesser extent – is arbitrary and capricious. That trucks historically have been exempted from proportional efficiency increases does not justify continuing the practice and so as to exacerbate the efficiency inequality between the two types of vehicles throughout the covered period, providing even more incentive for manufacturers to produce more "light trucks." Moreover, letting consumer choice trump fuel conservation violates the statute. A ratable footprint curve for light trucks that contains proportional annual increases and is proportional to the passenger car curve is necessary to comport with Congressional intent. [EPA-HQ-OAR-2010-0799-9479-A1, p. 14]

2. The NPRM creates an SUV loophole that is contrary to Congress' purpose in enacting EPCA – energy conservation

The National Academy of Sciences ("NAS") found that from 1970 to 1982, CAFE standards helped contribute to a 50 percent increase in fuel economy for new light trucks.68 This progress soon stalled, however. Light trucks became ever more popular in the ensuing decades because less stringent CAFE standards for light trucks provided incentives for manufacturers to invest in vehicles like SUVs and minivans and to promote them to consumers.69 NAS found that this market shift had a "pronounced" negative effect on overall fuel economy.70 [EPA-HQ-OAR-2010-0799-9479-A1, p. 14]

The NPRM would continue and exacerbate this market shift. Light trucks are disproportionately favored in the NPRM; starting off with lower fuel efficiency targets, their targets increase at a lower rate than passenger cars, and the heaviest and dirtiest light trucks are near-exempt during the first two years of the covered period, making them even more profitable. The Agencies repeatedly claim that the attribute-based standards discourage changes in vehicle size.71 Focused on safety concerns that have now been largely dispelled, the Agencies state that attribute-based standards are laudable because they prevent manufacturers from gaming the system by building too many light vehicles.72 That concern, however, has no basis in fact: historically it is the SUV segment, not the segment for small and efficient cars, which has shown the largest growth. The manufacture of too many fuel efficient cars sadly has never been the problem. Instead, the NPRM incentivizes the manufacture of too many gas guzzlers. [EPA-HQ-OAR-2010-0799-9479-A1, p. 15]

3. The NPRM must require ratable fuel efficiency increases for all light trucks

As shown in the tables above, the Agencies provide an estimate of the average fuel economy standards per year for all light trucks. In fact, however, the Agencies are proposing the smallest increases for the largest and dirtiest trucks for the first two years of the covered period. 73 [EPA-HQ-OAR-2010-0799-9479-A1, p. 15]

Not only does this proposal quite obviously remove any incentive to improve the gas mileage of these largest vehicles, it may also result in an additional statutory violation. Given the long lead-time between the final rule and 2017, manufacturers have substantial time to adjust to this scheme by manufacturing larger light trucks with less stringent fuel economy standards. Because the actual national fuel efficiency level is determined not by the standards themselves but by what manufacturers decide to build, it is possible that this predictable shift toward larger, less fuel efficient cars could prevent the nationwide fleet from reaching the statutory minimum of 35 mpg in 2020.74 The near-exemption for larger trucks must be dropped for this reason alone. [EPA-HQ-OAR-2010-0799-9479-A1, p. 15]

4. The NPRM should tighten the definition of light trucks to prevent incentives to reclassify

As has been recognized for some time, because there are separate curves for passenger cars and light trucks, manufacturers have incentives to reclassify passenger cars as light trucks to render them subject to less stringent fuel economy goals.

The EPCA defines passenger automobiles as follows: [EPA-HQ-OAR-2010-0799-9479-A1, p. 15]

[A]ny automobile that the Secretary decides by regulation is manufactured primarily for transporting not more than 10 individuals, but does not include an automobile capable of off-highway operation that the Secretary decides by regulation –

(A) has a significant feature (except 4-wheel drive) designed for offhighway operation; and

(B) is a 4-wheel drive automobile or is rated at more than 6,000 pounds gross vehicle weight.75 [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

Light trucks are defined by exclusion as automobiles that are not passenger automobiles or work trucks.76 NHTSA has further defined light trucks as automobiles with greater cargo-carrying than passenger-carrying volume, and as automobiles that permit expanded use of the automobile for cargo-carrying purposes through removal of seats or stowing of foldable seats.77 [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

This statutory definition can already incentivize upsizing as it allows manufacturers to add 4WD technology plus any other “off-highway” feature to a vehicle to automatically fall within the less stringent light truck classification. The Agencies themselves recognize that this incentive exists if the fuel economy standard for a truck with a given footprint is less stringent than that for passenger car with the same footprint.78 The issue is particularly significant where a vehicle is built with both a 4WD and a 2WD version. The 2WD drive version, if it does not otherwise qualify as a truck, is subject to the passenger car curve. The same version with 4WD and some other off-road feature such as higher ground clearance, however, becomes subject to the truck curve. These circumstances create different fuel economy standards for vehicles with the same footprint. Manufacturers thus have incentive to redesign 2WD vehicles by adding 4WD and some off-road feature. The even greater disparity in mileage standards between trucks and passenger cars created by the NPRM provides even larger incentives for this type of abuse of the statutory scheme. [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

The Agencies have addressed this concern by noting that “despite comments in prior rulemakings suggesting that any vehicle that appears to be manufactured ‘primarily’ for transporting passengers must be classified as a passenger car, the statute as currently written clearly provides that vehicles that are off-highway capable are not passenger cars.”79 Congress, however, intended that “passenger automobiles be defined as those used primarily for the transport of individuals.” 80 And, as the Ninth Circuit noted, “many light trucks today are manufactured primarily for transporting passengers.”81 Indeed, “[c]onsumers use light trucks primarily for passenger-carrying purposes in large part because that is precisely the purpose for which manufacturers have manufactured and marketed them.”82 EPCA’s drafters surely never intended manufacturers to be able to manipulate their products for the sole purpose of escaping higher efficiency standards. Accordingly, the Agencies must remove the SUV loophole. Moreover, we urge the Agencies to create a single footprint for both passenger vehicles and light trucks because that change would eliminate the gamesmanship that has played out historically and is sure to continue without it. [EPA-HQ-OAR-2010-0799-9479-A1, pp. 16-17]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 214-216.]

Rather than promoting technological innovations, these rules rely on small improvements in existing technology. And, also, rather than pushing industry to make more efficient smaller vehicles, these rules create what we're calling an SUV loophole by incentivizing industry to build more trucks and SUVs that won't have to increase their fuel efficiency standards at the same rate as passenger vehicles. And those are our three very big points of concerns for us in these rules.

And the result of these problems with the rules are they actually could end up with an increase in overall greenhouse gas emissions from our transportation center rather than a decrease.

So in regards to what we would like to see done in the final rule, we would like to see these rules significantly strengthened.

One of our main concerns is the fact that the proposed rules allow light-duty trucks and SUVs to increase their fuel efficiency at a much slower rate and pace than cars, and for many years this problem has caused automakers to build bigger vehicles so they could take advantage of these weaker standards that have caused our efficiency to stagnate behind the efficiency across the world.

And we should not make the same mistake twice; we should strengthen those standards for light-duty trucks and put them on a par with cars, and we can't afford to skew the rules in favor of more gas-guzzling SUVs and light trucks.

---

40 See 49 U.S.C. 32902(b)(3)(A). [EPA-HQ-OAR-2010-0799-9479-A1, p. 8]

41 See Tables 1 & 2. [EPA-HQ-OAR-2010-0799-9479-A1, p. 8]

44 Compare Tables 1 & 2. [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

45 49 U.S.C. § 32902(b)(2)(C)(emphasis added). [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

46 Webster's Online Dictionary, http://www.websters-online-dictionary.org (Search 'rateably') (last visited Feb. 9, 2012). [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

47 153 Cong. Rec. H16659, 16750 (emphasis added) (daily ed. Dec. 19, 2007). [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

48 Id. (emphasis added). [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

49 See Table 2. [EPA-HQ-OAR-2010-0799-9479-A1, p. 10]

53 See Ricardo, Inc., Computer Simulation of Light-Duty Vehicle Technologies for Greenhouse Gas Emission Reduction in the 2020-2025 Timeframe, EPA-420-R-11-020, at 66-67 (Nov. 29, 2011). [EPA-HQ-OAR-2010-0799-9479-A1, p. 11]

54 Max Warburton, et al., Bernstein Research, “Euro Autos: What Are the 10 Most Profitable Cards of Modern Times?, p. 4 (Nov. 15, 2011) (concluding that the top ten most profitable vehicles of modern time are led by pick-up trucks manufactured by Ford and GM, due to the large volume sold and because they have not undergone frequent technology upgrades). [EPA-HQ-OAR-2010-0799-9479-A1, p. 11]

55 Id. at 2. [EPA-HQ-OAR-2010-0799-9479-A1, p. 12]

56 NPRM, 76 Fed. Reg. at 74,860. The Agencies’ overemphasis of consumer choice also overlooks the fact that each consumer’s choice of a low-efficiency vehicle affects the overall fleet’s standards and thus decreases the benefits to society as a whole. The statutes set fuel efficiency standards that counteract individual choices that prevent energy conservation. [EPA-HQ-OAR-2010-0799-9479-A1, p. 12]

57 CBD v. NHTSA, 538 F.3d at 1195 (quoting Center for Auto Safety v. NHTSA, 793 F.2d 1322, 1338 (D.C. Cir. 1986). [EPA-HQ-OAR-2010-0799-9479-A1, p. 12]

58 See CBD v. NHTSA, 538 F.3d at 1207. [EPA-HQ-OAR-2010-0799-9479-A1, p. 12]

68 National Research Council. Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards, p. 14, Washington, DC: The National Academies Press, 2002. [EPA-HQ-OAR-2010-0799-9479-A1, p. 14]

69 Id. at 18. The fact that domestic manufacturers faced less competition in this category and could generate greater profits also contributed to the growth in SUV production. [EPA-HQ-OAR-2010-0799-9479-A1, p. 14]

70 Id. at 19. [EPA-HQ-OAR-2010-0799-9479-A1, p. 14]

71 See, e.g., NPRM, 76 Fed. Reg. at 74,875; 74,913. According to Kate S. Whitefoot and Steven J. Skerlos, "NHTSA constructed the foot-print based CAFE standards using a quantitative analysis but did not study whether manufacturers would have an incentive to change vehicle size as a result of the standards". See Kate S. Whitefoot and Steven J. Skerlos, Design I incentives to Increase Vehicle Size Created from the U.S. Footprint-Based Fuel Economy Standards, 41 ENERGY POLICY 402, 403 (2012). [EPA-HQ-OAR-2010-0799-9479-A1, p. 15]

72 Indeed, the Agencies admit that safety considerations that could support any provision of a disincentive for downsizing as a compliance strategy "apply weakly, if at all, to the very largest vehicles." 76 Fed. Reg. 74918. [EPA-HQ-OAR-2010-0799-9479-A1, p. 15]

73 See NPRM, 76 Fed. Reg. at 74,872, Figure 5-2. Through 2021, the annual fuel economy increase for light trucks is 4.0% for these smallest trucks, 2.3% for larger SUVs, and only 0.4% for the largest pickup trucks. [EPA-HQ-OAR-2010-0799-9479-A1, p. 15]

74 "Increasing vehicle footprint leads to a reduction in fuel economy and acceleration performance of the vehicle due to the increase in vehicle weight." Whitefoot, 41 ENERGY POLICY at 404. [EPA-HQ-OAR-2010-0799-9479-A1, p. 15]

75 49 U.S.C. § 32901(a)(18). [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

76 See id. at (a)(17). [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

77 49 C.F.R. 523.5(4)-(5). [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

78 See NPRM, 76 Fed. Reg. at 75,337. [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

79 NPRM, 76 Fed. Reg. at 75,337, n. 218. [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

80 See 68 Fed. Reg. 74,908, 74926 (Dec. 29, 2003). [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

81 See CBD v, NHTSA, 538 F.3d at 1207. [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

82 Id. at 1208. [EPA-HQ-OAR-2010-0799-9479-A1, p. 16]

Organization: Chrysler Group LLC

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 54.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 60-61.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 26.]

Chrysler agrees with setting the truck performance requirements based on the underlying physics of these types of vehicles. We believe the proposed 2017 through 2025 standards support this premise and correct the deficiencies in the 2016 model year rule, which overlooked these factors. The 2017 to 2025 truck standards are challenging while respecting the utility of these vehicles and their importance to the nation's economy.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 54.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 61.]

The truck standards for 2012 through '16 model year were not supported by fundamental science. Accommodating that science will seem to be restricted by statutory direction to not backslide on standards from previous years.

Organization: Consumers Union

It is counterintuitive and counterproductive to let the least fuel efficient models improve more slowly than more efficient models, and Consumers Union recommends that the light truck standard should be made more stringent, particularly in the cross-over range. A delta of 10-15 mpg by 2025 between passenger cars and light trucks of the same footprint is unreasonable, given the range of technologies and designs available for improving fuel economy. The gap in the proposed standards grows over time because light trucks are required to improve at a lesser rate, in addition to being subject to lower targets in absolute terms. [EPA-HQ-OAR-2010-0799-9454-A2, p.6]

IV. A stricter standard would deliver even greater consumer benefits

The proposed standards will likely save consumers billions of dollars and provide additional national security and environmental benefits. However, a higher CAFE target is achievable and would save consumers even more money on fuel at a reasonable investment cost. Especially given the regulatory flexibility and discrepancy between real-world and test results, a higher CAFE target is both achievable and desirable. [EPA-HQ-OAR-2010-0799-9454-A2, p.6]

As noted in prior comments, Consumers Union believes that allowing manufacturers to avoid stringent fuel economy standards by reclassifying passenger vehicles as light trucks as a way to game the system erodes consumer and oil saving benefits.[18] The current proposal's use of footprint-based curves that require vehicles of all size to improve in fuel economy is a significant improvement from letting light trucks off the CAFE hook. Indeed, vehicle "footprint" is a desirable attribute on which to base standards, for reasons noted in on pages 115-116 of NHTSA's Preliminary Regulatory Impact Analysis (PRIA). However, the gap between the curves is too large, especially in the cross-over SUV (approximately 42-50 sf) segment. [EPA-HQ-OAR-2010-0799-9454-A2, p.6]

There are several strong indicators that the gap between the curves is too large. First, the cost-per-vehicle to achieve the proposed standards is much lower for light trucks ($1,500) than for passenger cars ($1,950). This significant discrepancy indicates that light trucks have additional room for improvement at a reasonable cost. In addition, since passenger cars tend to be cheaper than light trucks, light trucks get off even easier in terms of compliance cost as a percentage of purchase price. [EPA-HQ-OAR-2010-0799-9454-A2, p.6]

Secondly, fuel economy savings are logarithmic, so allowing a lower percentage of improvement for vehicles that already have the lowest mpg is counterproductive for maximizing fuel savings and other benefits. The greatest potential for fuel savings is at the least efficient end of a fleet, but the vehicles at the bottom are provided the least stringent targets, even as a percentage of their current dismal performance. Third, the large gap provides a greater incentive to game the system by altering a vehicle to put it in the light truck category (increasing clearance or adding 4WD). For some vehicles, the compliance cost could be less than simply altering the vehicle to switch categories. Adding all-wheel or four-wheel drive does not generally warrant the extra leeway afforded under the proposed rules, especially in the cross-over market segment.[19] [EPA-HQ-OAR-2010-0799-9454-A2, p.7]

Negative consequences could result from the large gap. Cross-over vehicles are a growing market segment, and allowing cross-over vehicles to be counted in the light truck category significantly boosts a manufacturer's achieved CAFE average for light trucks. As a result, the larger and heavier vehicles will not need to make as much improvement as they would otherwise, even though the greater investment needed to make these improvements in the larger vehicles is the reason for a segmented standard in the first place. If the growing cross-over trend continues, the large gap between the curves will have deleterious effects on projected consumer savings and oil reduction.[20] [EPA-HQ-OAR-2010-0799-9454-A2, p.7]

As long as the light truck-passenger vehicle distinction remains in place, our recommended course of action is to alter the slope and floor values of the compliance curves so that there is less incentive to switch categories and to preserve the projected consumer savings. At the very least, the gap between the curves should be narrowed for the cross-over segment, and the gap should decrease, instead of increase, over time. The Union of Concerned Scientists has done extensive analysis on this topic, and we agree with their analysis and conclusion that a "backstop" would be an effective tool to preserve expected consumer savings and prevent exploitation of loopholes. If the agencies do not address this potential problem in the current rulemaking, we would urge them to perform rigorous analysis of this issue during the mid-term review to make sure that consumer benefits are indeed on track and that potential savings are not being squandered through manipulation of the standard. [EPA-HQ-OAR-2010-0799-9454-A2, p.7]

18 - See Appendix F: 'Comments of Consumers Union of the U.S., Inc. In response to Advance Notice of Proposed Rulemaking Docket No. 2003-16128 on Reforming the Automobile Fuel Economy Standards Program.'

19 - See Appendix G Comparison of Price and Operating Costs for 2WD and 4WD for real world examples of fuel economy differences between 2WD and AWD/4WD.

20 - NHTSA notes on page 71 of the PRIA that indeed, the market is expected to shift towards light trucks.

Organization: Ford Motor Company

The truck standards previously established for the 2012-2016 model years underestimated the unique challenges posed by the standards for the larger trucks, which have unique loadcarrying and towing capabilities that can be compromised by the fuel efficiency improvements more successfully applied on smaller vehicles. The current proposal will better enable manufacturers to develop and apply fuel economy technologies to light trucks without sacrificing the utility for which these vehicles are designed. [EPA-HQ-OAR-2010-0799-9463-A1, pp. 2 and 5]

Car and Truck Stringencies: The proposed fuel economy and GHG standards for 2017 and beyond take into account the particular attributes, needs and customer expectations for light trucks relative to passenger cars, and this must carry through to the final rule. [EPA-HQ-OAR-2010-0799-9463-A1, pp. 2 and 5]

Ford also believes that the relative stringency levels for the car and truck fleets, as proposed by the agencies, are appropriate. [EPA-HQ-OAR-2010-0799-9463-A1, p. 8]

Although the proposed 2017 – 2021 model year truck standards may appear to be less stringent than the car standards for the same years, this is not the case. In terms of the product actions necessary to comply, the proposed car and truck standards are roughly equivalent in stringency. This is attributable to the unique attributes expected from trucks—particularly the larger work trucks that constitute a significant portion of our full-line vehicle fleet offering—and also to the overly stringent standards imposed on light duty trucks in the 2012-2016 model year regulation. [EPA-HQ-OAR-2010-0799-9463-A1, p. 8]

Heavier pick-up trucks are expected to deliver even more cargo carrying and towing capacity not required from passenger vehicles. Such vehicles are used by consumers and small business owners for activities such as towing or hauling construction goods and machines, farm goods, landscape material, lawn maintenance equipment, home furnishings, animals, vehicles and trailers. Ford survey data shows up to 82% of F-150 customers use their vehicles for hauling. Up to 41% haul on at least a monthly basis; and 72% of F-150 customers use their vehicles for towing. Up to 28% tow on at least a monthly basis. [EPA-HQ-OAR-2010-0799-9463-A1, p. 8]

To achieve this capability, vehicles equipped with trailer tow packages include additional features that clearly distinguish them from passenger cars, and can negatively impact fuel economy:

- Auxiliary transmission oil coolers
- Upgraded radiators
- Trailer hitch connectors and wiring harness equipment
- Different steering ratios, upgraded rear bumpers and different springs for heavier tongue load (for upgraded 'max' trailer tow packages)
- Body on frame (vs. unibody) construction to support capability and an aggressive duty cycle
- Lower axle ratios for better pulling power/capability

in addition, vehicles with towing capability generally have increased aerodynamic drag caused by a modified frontal area, increased rolling resistance, and a heavier frame and suspension to support this additional capability.

We are seeing a continuing trend that our customers are purchasing these vehicles for work purposes. Based on 2011 segmentation models for our full size pick-up trucks, Business users account for approximately 30% of the market. The Business category includes fleet and work trucks (e.g. small business owner, farmer, foreman), as well as those customers who use their truck for occupational purposes during the week and personal use on the weekend. About 58% of the market is comprised of Recreational users, including hunters, boaters, fisherman, etc. These consumers rely on their vehicles for hauling and towing to support their recreational activities. Only a relatively small segment (12%) of the market is comprised of consumers who do not make significant use of the towing/ hauling/off-road capabilities of the truck. Based on the trends we have seen in the market, we fully anticipate that such buyers will continue to be a shrinking portion of our market. We believe that within a few years, the Business category will increase to over 40% of the market, and the combined Business/Recreational users will increase to over 90% of the market for full size pick-up trucks.

And to further demonstrate the importance of these vehicles to the American economy, the following graph demonstrates that new home construction, a key financial indicator, and the sales of the trucks needed to help this industry, go hand in hand. [EPA-HQ-OAR-2010-0799-9463-A1, p. 9]

In order to be fair to all manufacturers and avoid creating market imbalances, the stringency of the car and truck standards needs to be comparable in terms of the effort and level of investment necessary to comply. The imbalance in the relative stringency of the car/truck standards in the 2012-2016 rules needed to be corrected. In light of the above, we believe that the agencies' proposal with respect to car/truck stringency is sound and should be carried through to the final rule. [EPA-HQ-OAR-2010-0799-9463-A1, p. 10]

In the proposal, EPA makes reference to the fact that it “underestimated the impact of the different pickup truck model configurations” in the model year 2012-2016 rule, and that the “very largest light trucks have significant load-carrying and towing capabilities that make it particularly challenging for manufacturers to add fuel economy-improving/CO_2-reducing technologies in a way that maintains the full functionality of those capabilities." (76 Fed. Reg. 74919). We agree with this observation. The 2012-2016 truck standards did not fully account for the consumer-driven attributes of larger trucks, which, due to the technology trade-offs discussed above, created particular challenges for full-line truck manufacturers. [EPA-HQ-OAR-2010-0799-9463-A1, p. 10]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 45-46.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 35.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 87.]

In particular, EPA acknowledged it had underestimated the impact of the different pickup truck model configurations in the model year 2012 to 2016 rule. They further acknowledged that the 'very largest light trucks have significant load-carrying and towing capabilities that make it particularly challenging for manufacturers to add fuel economy-improving technologies in a way that maintains the full functionality of those capabilities.' We concur with the agencies' analysis and conclusions

Organization: General Motors Company

GM supports the target standard curve shapes, the relative car and truck stringency, and the statistical analysis used to analyze the fleet. [EPA-HQ-OAR-2010-0799-9465-A1, p.2]

GM also urges careful consideration of two key issues raised in the Alliance comments that would affect the implementation stringency of the proposal, namely whether NHTSA should change the current definition of what constitutes a passenger car and a light truck and whether NHTSA needs to further adjust the stringency of its proposed curves to more fully harmonize with the EPA proposed requirements and flexibilities. [EPA-HQ-OAR-2010-0799-9465-A1, p. 2]

Organization: Institute for Policy Integrity, New York University School of Law

The second justification offered is that a footprint-based approach will avoid negative safety impacts. To start, the footprint-based approach does not completely eliminate the incentive to build smaller cars to comply with the rule. The mathematical formulas that set the standards are only strictly increasing along the range from 40 square feet to either 55 square feet for cars or 75 square feet for trucks; at other points, the curve is flat. Admittedly, that central range covers most vehicle models.88 However, at least several dozen models (mostly subcompacts and sports cars) fall in the 30-40 square feet range,89 which are all subject to the same standards. At a minimum, the manufacturers of these models may have an incentive to decrease footprints as a compliance strategy, since doing so would not trigger more stringent standards. [EPA-HQ-OAR-2010-0799-9480-A1, p. 14]

Organization: Insurance Institute for Highway Safety (IIHS)

IIHS does have some concern regarding the “breakpoint” of the fuel economy curve at the lower extreme where footprint is the smallest (see Figure I-1 on page 74871 of the notice). This “breakpoint” is the leveling-off point on the fuel economy curve where the fuel economy requirement ceases to increase as footprint decreases. Moving this breakpoint farther to the left so that even smaller vehicles have increasing fuel economy requirements would reduce the chance that manufacturers would downsize the lightest vehicles for further fuel economy credits. [NHTSA-2010-0131-0222-A1, p. 1].

Organization: International Council on Clean Transportation (ICCT)

17. Separate footprint curves for cars and light trucks distort the requirements by making it easier for vehicle classified as light trucks to comply. Unlike the 20122016 requirements, the 2017-2025 rule increased the gap between cars and light trucks, providing stronger incentives for manufacturers to reclassify cars as light trucks and potentially undermining the benefits of the rule. A single footprint function would still give larger trucks a less stringent target to meet, while avoiding vehicle classification games. [EPA-HQ-OAR-2010-0799-9512-A1, p. 4]

The proposed 2022-25 standards would set consistent improvements for all cars and light trucks, with annual CAFE increases of 4.7% per year and annual GHG reductions of 5.0% per year. However, both EPA and NHTSA proposed a lower annual rate of improvement for light-trucks in the early years of the program. EPA is proposing an annual GHG reduction for cars of 5%, but only 3.5% for light trucks. Similarly, NHTSA is proposing an annual fuel economy increase of 4.3% for cars, but only 2.9% for light trucks. The required reductions for light trucks are also tilted, such that the smallest light trucks have larger increases (but still less than cars), while the larger light trucks have smaller increases. Figure 4 illustrates this effect. The annual fuel economy increases from 2016 to 2021 for cars is almost flat and ranges from 4.2% to 4.4%. The annual fuel economy increase for light trucks starts at 4.0% for the smallest trucks, drops to 2.3% for larger SUVs, and falls off to only 0.4% for the largest pickup trucks. Note that the 2012-16 standards also imposed smaller increases on the larger vehicles than they did on smaller vehicles. [Figure 4 can be found on p. 49 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, pp. 48-49]

Footprint systems are designed to encourage the use of lightweight materials (unlike weight-based standards) without affecting the mix of vehicles sold in the market. Under a footprint-based system, selling more small vehicles does not necessarily help manufacturers meet the standards, as smaller vehicles are subject to more stringent targets. However, the slope of the footprint curve and the difference between the car and light truck curves matter. The steeper the slope of the footprint curve, the more incentive manufacturers have to increase the size of their vehicles. And the larger the difference between the car and light truck curves, the more incentive a manufacturer has to add four-wheel drive and jack the vehicle up just enough to meet the ground clearance criteria so that the vehicle can be reclassified as a light truck. These are perverse incentives, as increasing the size of the vehicle or reclassifying cars as light trucks makes it easier for a manufacturer to meet the requirements while also increasing the fuel consumption and CO_2 emissions from the vehicle. [EPA-HQ-OAR-2010-0799-9512-A1, p. 49]

The tilt in the increase in light truck stringency, as illustrated in Figure 4, increases the incentive for manufacturers to increase the size of light trucks, especially pickup trucks. [Figure 4 can be found on p. 49 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 49]

More importantly, the lower requirements for all light trucks would increase the incentive to reclassify cars as light trucks. As illustrated in Figure 5, the 2012-2016 standards and the 2022-2025 standards have almost no impact on the relationship between the stringency of the car and the light truck targets. However, during the 2017 to 2021 timeframe, when the annual efficiency gains for light trucks are much lower than for cars, the difference in stringency between cars and trucks grows dramatically. As proposed, the 2017-2021 standards will increase the incentive to reclassify cars as light trucks, with a small additional incentive for the smallest cars and gradually increasing for larger cars. Fortunately, few cars have a footprint larger than about 54 sq.ft at present. [Figure 5 can be found on p. 50 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 50]

Single footprint curve

The proposed rule maintains separate footprint curves for cars and light trucks. This subjects light trucks with the same footprint to much less stringent standards and gives manufacturers a tremendous incentive to reclassify cars as light trucks. In the future it is likely to cause manufacturers to drop many 2wd versions of their small SUVs and make less efficient 4wd versions standard, so that they can be classified as light trucks instead of cars. This will actually increase overall real world fuel consumption and CO_2 emissions in two ways. First, it will increase 4wd installation and directly increase the fuel consumption of the fleet. Second, it makes it easier for manufacturers to meet the standards, so that they do not have to implement as much technology on other vehicles. [EPA-HQ-OAR-2010-0799-9512-A1, p. 50]

The large majority of light trucks today are based on car platforms with unibody construction. All minivans use unibody construction and cab-and-chassis construction for SUVs is rapidly disappearing. Except for pickup trucks, full-size cargo vans, and a few relatively low volume SUVs, such as the Jeep Wrangler and the Suburban, in the 2017-25 timeframe of the rule all light trucks will be based on car platforms. In addition, due to the empty pickup bed and empty cargo box, pickup trucks and cargo vans are considerable lighter than SUVs with the same footprint and fit well on a single footprint line. Thus, there is no technical reason to maintain separate footprint lines for cars and light trucks. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 50-51]

EPA recognized the importance of this issue when it established a single Tier 2 emission standard for all cars and light trucks. The issue here is just as important. It is time to begin the process to end this artificial distinction between cars and light trucks for fuel efficiency and greenhouse gas emissions. The ICCT recommends a single footprint function, which will still give larger trucks a less stringent target to meet, while avoiding vehicle classification games and helping to ensure fuel consumption and GHG emission goals are actually met. [EPA-HQ-OAR-2010-0799-9512-A1, p. 51]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 197.]

The separate footprint curve to cars and light trucks also distort the requirements by making it easier for vehicles classified as light trucks to comply. A single footprint function would still give larger trucks a less stringent target to meet while avoiding vehicle classification games.

Organization: Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)

The proposed standards for light trucks are significantly weaker than for cars. In the past, automakers made vehicles bigger to qualify for weaker standards. Light truck standards should be strengthened to prevent automakers from gaming the system. [EPA-HQ-OAR-2010-0799-10166-A2_MASS, p.1]

Organization: Mass Comment Campaign (375) (Union of Concerned Scientists-2)

The proposed standards for light trucks are significantly weaker than for cars. In the past, automakers made vehicles bigger to qualify for weaker standards. Light truck standards should be strengthened to prevent automakers from gaming the system. [EPA-HQ-OAR-2010-0799-1246-A1_MASS, p.1]

Organization: Mass Comment Campaign (4,505) (Unknown Organization)

The proposed rules allow light trucks to increase their fuel efficiency at a much slower rate than cars. For many years, this problem led automakers to build bigger vehicles so they could take advantage of these weaker standards, which caused efficiency standards in the United States to stagnate. We should not make the same mistake twice, and should strengthen the standards for light trucks on a par with cars. We cannot afford to skew the rules in favor of gas-guzzling SUVs. [EPA-HQ-OAR-2010-0799-9595-A1_MASS, p.1]

Organization: Mass Comment Campaign (9,570) (Unknown Organization)

The proposed standards for light trucks are significantly weaker than for cars. In the past, automakers made vehicles bigger to qualify for weaker standards. Light truck standards should be strengthened to prevent automakers from gaming the system. [EPA-HQ-OAR-2010-0799-9578-A1_MASS, p.1]

Organization: National Association of Clean Air Agencies (NACAA)

First, NACAA understands that EPA and NHTSA are proposing that passenger cars have an average rate of improvement of 5 percent for MYs 2017 to 2025. However, light-duty trucks will start with an average rate of improvement of 3.5 percent for MYs 2017 through 2021 and 5 percent for MYs 2022 through 2025. These proposed rates of improvement are envisioned to result in an average CO_2 emissions rate of 163 grams per mile (g/mile) with an average fleet performance of 54.5 miles per gallon (mpg) if every manufacturer incorporates enhanced engine technologies. In addition, the proposal provides only a conditional approval of the standards by NHTSA for MY 2022 to 2025 vehicles. [EPA-HQ-OAR-2010-0799-8084-A1, p. 3]

NACAA supports EPA's and NHTSA's goal of a fleetwide performance that will result in 54.5 mpg fuel efficiency. We are concerned, however, that the approach taken in the proposal may undermine achievement of this goal. In fact, in a recently published study, researchers at the University of Michigan consider whether allowing a more lenient 3.5-percent rate of improvement requirement for larger vehicles creates an incentive for the manufacture of larger vehicles to the extent that it could lower the overall fleet performance standard by as much as four miles per gallon, thus undermining the goal of a 54.5-mpg fuel economy standard.[12] Accordingly, NACAA urges EPA and NHTSA to ensure that the full measure of the reductions envisioned by EPA and NHTSA is achieved. In addition, NACAA requests that EPA and NHTSA respond to the issues raised in the University of Michigan study. [EPA-HQ-OAR-2010-0799-8084-A1, p. 3]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 39-40.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 34-35.]

---

[12] Kate S. Whitefoot and Steven J. Skerlos, "Design Incentives to Increase Vehicle Size Created from the U.S. Footprint-based Fuel Economy Standards," January 2012, available at http://designscience.umich.edu/alumni/katie/Whitefoot_Skerlos_Footprint.pdf. [EPA-HQ-OAR-2010-0799-8084-A1, p. 3]

Organization: Natural Resources Defense Council (NRDC)

NHTSA should revise truck definitions to reduce the incentive for cars to be reclassified as trucks and take advantage of a less stringent compliance regime. [EPA-HQ-OAR-2010-0799-9472-A2, p. 3]

2. Fuel Consumption and Pollution Reductions are Undermined by Large Gap between Car and Truck Curves; Agencies Should Revise Truck Definitions to Prevent Gaming

The large gap between the car and light truck curves creates an incentive that threatens to undermine the predicted oil and GHG reductions of the program. Automakers could have a strong incentive to modify vehicles classified as cars today to be reclassified as trucks because the truck curve has substantially less stringent compliance levels for the same footprint. NHTSA previously recognized that many crossover vehicles had been inappropriately classified as trucks. Starting with MY 2011, NHTSA required two-wheel drive crossovers that were previously subject to truck fuel economy standards to be shifted to the car fuel economy compliance requirements. NHTSA estimated that over a million vehicles required reclassification from trucks to cars.33 It is our concern that many automakers will modify vehicles or shift sales from crossovers currently on the car curve to the truck curve. [EPA-HQ-OAR-2010-0799-9472-A2, p. 10]

One way to make the curve shift is by the addition of four-wheel drive (4WD) capability. Adding four-wheel drive technology could classify a car into a truck yet have minimal impact on the actual fuel efficiency and emissions of the vehicle. By making the shift, a vehicle was previously complying with the car curve would immediately overcomply on the truck curve. The automaker’s decision to add 4WD capability will largely be influenced by whether or not the cost to add the 4WD technology is less than adding the fuel efficiency and emissions technology necessary to stay compliant on the car curve. [EPA-HQ-OAR-2010-0799-9472-A2, p. 10]

Consider the case of the popular Toyota RAV4 crossover and compliance with GHG emission standards. With a footprint of 44.6 square feet (ft2), the two-wheel drive RAV4 car requirement in 2016 is 223 g/mi. Adding 4WD will increase emissions by about 5 g/mi to 228 g/mi. If reclassified as a truck, the 4WD RAV4 would subject to less stringent compliance standards and at 228 g/mi, it would meet the meet the MY 2020 requirement for trucks at the 44.6 ft2 footprint. [EPA-HQ-OAR-2010-0799-9472-A2, p. 10]

By immediately complying with the MY 2020 standard, Toyota could avoid adding technologies to cut emissions from 2016 to 2020, and save approximately $1000. If Toyota can add 4WD technology for less than $1000, then they would have an incentive to shift RAV4 models from car classification to truck classification. The difference in MSRP between 2WD and 4WD models of the 2012 RAV4 is $1400 but actual costs could be less than $1000. [EPA-HQ-OAR-2010-0799-9472-A2, p. 10]

NHTSA and EPA should reduce the incentive to reclassify vehicles from the car to truck curves. The gap between the car and truck curves should be reduced, especially for footprints of crossovers similar to the RAV4. The emissions and fuel efficiency difference between 2WD and 4WD crossovers on the market today is often less than 10 g/mi yet the car and truck curves differ by over 40 g/mi. The agencies should also revise truck definitions to better distinguish truck-only capabilities. For example, trucks should be required to have technologies that are necessary for true off-road capability vs. typical all-wheel on-road driving. [EPA-HQ-OAR-2010-0799-9472-A2, p. 10]

---

33 74 FR 14196 at 14204. [EPA-HQ-OAR-2010-0799-9472-A2, p. 10]

Organization: Nissan North America, Inc.

The standards applicable to the light-duty truck fleet for MYs 2022-2025 are particularly challenging. Especially for automakers with more limited volumes in the light truck segment, the cost feasibility of implementing more advanced technology is limited. As manufacturers re-evaluate their commitment to these market segments, the broad industry-wide investment in truck technologies that can be spread through the industry is uncertain. Moreover, the willingness of the market to absorb substantial additional costs to ensure achieving the proposed standards is questionable as the light-duty truck segment is a cost-sensitive market. [EPA-HQ-OAR-2010-0799-9471-A1, p.8]

Organization: RVIA

Towing considerations for full size pickups

RVIA has commented in the past on the importance of considering towing when setting future GHG and CAFE standards for full size pickups. RVIA is pleased to see that the proposed standards for full size pickups do indeed take towing into consideration and we therefore support the standards proposed for the 2017-2021 model years. However, we are concerned that the costs associated with the standards proposed for the 2022-2025 model years could potentially hurt full size pickup truck sales. This would in turn have a negative effect on sales of towable RVs because when a person shopping for a new towable RV cannot afford to buy the vehicle capable of towing it, they will not purchase the RV. [EPA-HQ-OAR-2010-0799-9550-A2, pp.1-2]

Towing considerations for large passenger cars, small SUVs and crossover vehicles

With the price of gasoline hovering around four dollars per gallon today, consumers are buying SUVs that ride more like a car, get better fuel economy, but have a greatly diminished towing capacity. For example, the consumer who several years ago might have purchased a Chevy Tahoe (3 rows of seats and towing capacity of 8,500 lbs) might instead today purchase a Chevy Traverse which also has three rows of seats but has a maximum towing capacity of only 5,200 lbs. Similarly, consumers that previously might have purchased an SUV like a Volkswagen Toureg now consider smaller SUVs like the Tiguan, a minivan or even a station wagon. As this downsizing trend progresses, consumers (as they are already) will demand that these vehicles offer more towing capability than offered today. Therefore, we recommend that EPA and NHTSA closely examine whether they have appropriately considered this future light vehicle towing trend in setting standards for light duty passenger cars, cross-over vehicles, minivans and other vehicles that will be used by consumers to tow RV trailers, boats, ATVs, utility trailers, U-Haul rental trailers and the like. [EPA-HQ-OAR-2010-0799-9550-A2, p.2] [There are also images associated with this paragraph, please refer to EPA-HQ-OAR-2010-0799-9550-A2, pp.2-3]

Organization: Salinas, A.

SUVs are being allowed to improve gas-mileage standards later than passenger vehicles, and that has spurred the production of even more SUVs. These standards leave the United States behind Europe, Japan, and China in fuel efficiency. [EPA-HQ-OAR-2010-0799-7119-A1, p. 1]

Auto makers are being coddled into taking only baby-steps to improve already-existing technology. We are much better than that. At this pace, 2025 will not see much more fuel-efficiency than what some cars already have. By 2025 the United States should do better than the European Union, China and Japan, not continue to lag behind them. [EPA-HQ-OAR-2010-0799-7119-A1, p. 1]

We need better, stronger rules to make real progress in the fight to reduce greenhouse gas emissions and improve fuel efficiency, and we need for SUVs to be made adhering to the same standards as passenger vehicles. [EPA-HQ-OAR-2010-0799-7119-A1, p. 1]

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Take steps to address weaker standards for light trucks: Closing the gap between cars and trucks has been a long-term concern for our organizations. We remain deeply concerned about the lower rate of improvement the light truck curve requires overall, driven by the much less stringent curve at the large footprint end of the light truck spectrum. The EPA is proposing lower annual emissions reductions of 3.5 percent per year for MY 2017-2021 light duty trucks. NHTSA is also proposing a low annual increase in fuel economy for light trucks for the first phase of standards which include MY 2017-2021 to be 2.9 percent per year on average (even lower for larger light trucks). The proposed rule presumes that additional increases will be achievable after 2021 – 5% emissions reductions for trucks and 4.7% annual efficiency improvements. This treatment results in the direct loss of greenhouse gas reductions relative to reductions that would have been achieved with a uniform 5% annual emissions reduction across all classes, and may undermine the benefits of the program. The lower rate of improvement in the early years could undermine the mid-term review and achieving the long term stringency of the National Program. [EPA-HQ-OAR-2010-0799-9549-A2, p. 6]

The agencies are continuing to use an attribute based curve for model years 2017-2025. While the car curve is the same as from the 2012-2016 standards, the agencies are changing the light truck curve. The proposed changes will increase the slope and extend the large footprint cut off point to larger footprints. By increasing the slope the rule will create an incentive to upsize vehicles that would continue through MY2025. The agencies consider this factor in the NPRM, noting that a “steeper footprint based standards may incentivize vehicle upsizing, thus increasing the risk that the fuel economy and greenhouse gas reduction benefits will be less than expected. Extending the slope part of the target curve will have adverse consequences for both emissions and safety. [EPA-HQ-OAR-2010-0799-9549-A2, p. 6]

We appreciate the agencies efforts to structure a program to encourage and reward application of “game-changing” hybrid technology to the largest pickups. To limit the impact of the proposed curves and treatment of light trucks, even with the incentive program in place, we recommend that the agencies provide an alternate emissions target for light trucks of 60 sq. feet and above that exceed the sales projected in the rule. This alternate emissions target will come into effect in the year that sales exceed the projected sales in the rule. By setting an alternate emissions target level representing a 4.8 percent annual reduction from the maximum 2016 truck target of 349 g of CO_2 per mile, automakers will be discouraged from increasing sales volumes at this end by producing lower cost and inefficient vehicles. [EPA-HQ-OAR-2010-0799-9549-A2, p. 6]

The gap between average car and truck emissions would widen due to the differing rates of improvements for cars and trucks under the proposed standards. This may further encourage manufacturers to reclassify certain large-footprint cars as trucks and/or change the balance of two-wheel drive and four wheel-drive SUV production, reducing the emissions benefits of the 2017-2025 standards. [EPA-HQ-OAR-2010-0799-9549-A2, p. 6]

In the past, the light truck loophole resulted in manufactures producing greater numbers of trucks. We are concerned that in the early years of the program automakers will take advantage of the weaker standards for light trucks, which will make it difficult to produce higher efficiency vehicles in the later years of the program setting automakers up for failure. [EPA-HQ-OAR-2010-0799-9549-A2, p. 7]

Automakers are already gearing up to take advantage of this loophole. A New York Times article reported in 2011 that sales of larger vehicles were up by 28.5% compared to an increase in car sales of 7% from 2010 sales in the same month.22 [EPA-HQ-OAR-2010-0799-9549-A2, p. 7]

Therefore we also urge the agencies to revisit the light truck definition as set by NHTSA in the 2011 fuel economy rule to further discourage reclassification of cars as trucks and substitution of two wheel drive with four wheel drive SUVs, simply to avoid the more stringent car standards. [EPA-HQ-OAR-2010-0799-9549-A2, p. 7]

---

22 http://www.nytimes.com/2011/02/02/business/02auto.html

Organization: Smith, Frank Houston

Data is also available for 1472 UK Light 4X4s, Pickups, and Vans rated Euro Step IV Emissions and above at http://vanfueldata.dft.gov.uk/Default.aspx. [NHTSA-2010-0131-0240-A1, p. 3]

There are currently 402 Euro Step V certified vans and pickups … only 9 gasoline, 14 CNG, and 379 diesel fueled configurations with gross weights capabilities from 1690 up to 4,560 kg providing fuel economies from 19.5 to 78.3 mpg(Imperial) combined based on the NEDC test cycle. [NHTSA-2010-0131-0240-A1, p.3]

Organization: South Coast AQMD

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 69.]

In addition, we want to emphasize that additional assurances are needed to ensure that the overall fleet performance of 5 percent is met. The proposal rule allows light-duty trucks produced in

2017 to 2021 to improve at a rate of only 3.5 percent. If sales of light-duty trucks during this time period exceeds expectations, then the overall fleet performance will be further reduced.

In addition, the use of early credits may lead to the production of light-duty vehicles that do not necessarily have to meet the 5 percent improvement rate.

Organization: Toyota Motor North America

While Toyota understands that the utility provided by larger trucks is a factor driving the lower overall target increases for trucks as a whole, and the lack of improvement required for larger trucks for 2017-2021 model years, the agencies must ensure that purchasers of affordable and fuel efficient smaller cars (and smaller trucks) do not bear a disproportionate burden as a result. As proposed, the standards may drive manufacturers of smaller footprint cars to add technology and cost to vehicles that are already among the most fuel-efficient and price sensitive in the market, while requiring little improvement of the largest vehicles on the road. This dilemma appears to be an unintended consequence of the shift to an attribute-based fuel economy and greenhouse gas regulation scheme and must be considered as standards are increased in this rulemaking and in the future. [EPA-HQ-OAR-2010-0799-9586-A1, p.2]

In particular, NHTSA should take steps to modify its target curves to account for the limited credit trading and transferring allowed under its authorizing statute. [EPA-HQ-OAR-2010-0799-9586-A1, p.2]

Nonetheless, we remain concerned about two aspects of the proposed standards. First, the targets for trucks require a lower average rate of improvement than for cars. And second, the targets for larger trucks require a lower average rate of improvement than smaller trucks. In fact, the target curves for the largest trucks remain flat for several years before increasing at all. This discrepancy is exacerbated by the availability of several credit opportunities - discussed later in these comments - that are applicable to certain large trucks at the exclusion of all other market segments. [EPA-HQ-OAR-2010-0799-9586-A1, p.5]

While Toyota understands that the utility provided by larger trucks is a factor driving the lower overall target increases for trucks as a whole, and the complete lack of improvement required for larger trucks for 2017-2021 model years, the agencies must ensure that purchasers of affordable and fuel efficient smaller cars (and smaller trucks) do not bear a disproportionate burden as a result. The target curves as proposed will drive manufacturers of smaller footprint cars to add technology and cost to vehicles that are already among the most fuel efficient in the market, and which are also among the most price-sensitive in the market, while requiring virtually nothing of the largest vehicles on the road. This dilemma appears to be an unintended consequence of the shift to an attribute-based fuel economy and GHG regulation scheme and must be considered as standards are increased in this rulemaking and in the future. [EPA-HQ-OAR-2010-0799-9586-A1, p.5]

Organization: Union of Concerned Scientists (UCS)

(b) Loss in Benefits from Increased Vehicle Size and Car/Truck Reclassification

In the proposed rule, the agencies project a sales mix in MY2025 of 66.9% passenger cars and 33.1% light trucks. This represents a significant consumer shift towards passenger cars from today's sales mix. While we agree that a variety of market and regulatory factors will move sales in this direction, the magnitude of this shift will strongly influence the actual outcome of these standards. This mix could shift for a host of reasons, including market forces, or because of compliance strategies adopted by automakers to either (a) reclassify cars as light trucks or (b) add size to vehicle footprints to qualify for weaker standards. According to the California Air Resources Board, "the extent to which the future fleet trends move toward larger average vehicle sizes and/or more trucks than projected in this analysis could significantly undermine the expected GHG benefits."29 CARB goes on to quantify how as much as a 16 percent loss in emissions reduction could result from even a modest shift to larger vehicles and an increase in market share of light trucks. And this concern is not without evidence. As Tom Cackette, Chief Deputy Executive Officer of the California Air Resources Board, noted at a recent public hearing, "We have some insight into the [auto industry's] business plans that suggest that we should worry about this."30 This concern is also consistent with past efforts by automakers such as Chrysler and Subaru to reclassify cars as "trucks" as well as the overall shift to SUVs during the 1990s as automakers took advantage of the significant difference in the car and light truck standards. [EPA-HQ-OAR-2010-0799-9567-A2, p. 7]

Modifying crossover-type vehicles currently defined as cars in order to qualify them as 'non-passenger vehicles' may pose an attractive strategy to automakers, as they could generate a windfall of credits due to weaker trucks standards. The fastest growing segment of vehicles over the past decade has been the crossover vehicle segment, growing from less than 5% in 2000 to nearly 25% of light-duty vehicles in 2010. The most popular of these vehicles are offered in 2wd and 4wd configurations, such as the Ford Escape, Toyota RAV4, and Honda CR-V. Consistent with current federal definitions, the 2wd variants of these vehicles are classified as cars while the 4wd versions are classified as light trucks. If the size of the gap between car and light truck standards at a given vehicle footprint is large enough, it alone can provide an incentive to automakers to modify the 2wd variant of crossover vehicles to meet the light truck definition. Today's popular 4wd versions of mid-size crossover vehicles emit 2 to 3 percent more global warming emissions than their 2wd counterparts. Yet the gap in the proposed standards between cars and trucks ranges from about 16 to 19 percent. This large gap presents a sizable loophole in the regulation and could result in a large loss in program benefits should manufacturers find it more economical to reclassify and migrate models to the less-stringent truck standard. [EPA-HQ-OAR-2010-0799-9567-A2, p. 8]

An even more troubling, though equally plausible scenario, is that a manufacturer could modify a halo vehicle to meet the truck definition with the express intent of minimizing obligations on the rest of its light truck fleet. At a January 19, 2012 public hearing in Philadelphia, PA on the proposed MY2017-2025 standards, a representative of Toyota Motor North America referred to the company's new Prius V as a crossover vehicle. This model is classified as a station wagon in EPA's fuel economy guide, and should be appropriately held to the more stringent passenger vehicle ('car') standard. However, if Toyota chose to apply a third row of seats, or to add a 4wd transmission and increase the vehicle's ground clearance, the Prius V would be close to, if not already, meeting the non-passenger ('light truck') definition. Doing so could have a profound effect on Toyota's remaining truck fleet. According to fueleconomy.gov, the Prius V's unadjusted 2-cycle fuel economy is 58.7 mpg; even assuming a 10 percent loss in (unadjusted) fuel consumption from applying 4wd and other modifications, the model would still achieve 53.4 mpg – more than 20 mpg over the 2017 target specified for the Prius V's 46.1 ft2 footprint. At a reasonable sales volume, this would create a massive windfall of credits, allowing Toyota to remain compliant while making very few improvements to the remainder of its light truck fleet. [EPA-HQ-OAR-2010-0799-9567-A2, p. 8]

With examples such as the one above, it is clear that the set of criteria used to differentiate passenger and non-passenger vehicles is inadequate, providing automakers ample opportunity to game the system and undermine the benefits of the program. One solution is to adjust the target curves, particularly in the 45 (+/- 3) ft2 footprint range seen by many crossover vehicles, to minimize the gap between car and light truck targets. [EPA-HQ-OAR-2010-0799-9567-A2, p. 8]

Though I strongly support these standards, I am concerned about possible loopholes that automakers could exploit. Specifically: The proposed standards for light trucks are significantly weaker than for cars. In the past, automakers made vehicles bigger to qualify for weaker standards. Light truck standards should be strengthened to prevent automakers from gaming the systems. [EPA-HQ-OAR-2010-0799-9713-A2, p. 2]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 218-219.]

We're also very concerned that significantly weaker standards for light trucks could give auto makers an incentive to reclassify passenger vehicles as non-passenger vehicles.

For example, the gap of roughly six to ten MPG exist between car and light truck target stringencies in the footprint range seen by many crossover vehicles.

This gap is much larger than the fuel economy loss a crossover would face from adding four-wheel drive, which could enable it to qualify it for a weaker standard as a non-passenger vehicle.

Gaming of the system like this will cut down on the anticipated program benefits giving the sizable and growing popularity of the crossover vehicle segment. The agencies cannot afford to dismiss this issue.

Organization: United Automobile Workers (UAW)

In particular the UAW supports the aspects of the proposals that recognize the importance of balancing the challenges of adding fuel-economy improving technologies to the largest light trucks with the need to maintain the full functionality of these vehicles across a wide range of applications. Second, the UAW believes that the agencies made reasonable determinations regarding the shape and slope of the curves that describe the proposed requirement for any particular size vehicle. Third, the UAW is pleased that the proposed CAFE regulations maintain the alternative minimum standard for domestically manufactured passenger cars. This requirement was maintained in EISA as an express mechanism to ensure a certain level of efficiency for the domestically-produced passenger car fleet. [EPA-HQ-OAR-2010-0799-9563-A2, p.2]

Organization: Volkswagen Group of America

Through these comments, Volkswagen will outline our main concerns and will define the implications of key elements which will lead to the inequitable treatment amongst manufacturers. Volkswagen will conclude the comments with a series of proposals aimed at improving the overall balance of the rule. [EPA-HQ-OAR-2010-0799-9569-A1, p. 3]

It was Volkswagens' position that all segments of vehicles within each compliance fleet should be capable of carrying an equitable burden in CO_2 reduction per year. [EPA-HQ-OAR-2010-0799-9569-A1, p. 5]

a. Equal stringency for cars and trucks in the range of 4%/year for 2017-2021

It was Volkswagen's position based on predictions for technical readiness and consumer affordability that an annual reduction in the range of 4% CO_2 promoted a balanced regulation for both cars and trucks for 2017-2021. An equal stringency equitably distributes the burden for reduction across all segments within the fleet. [EPA-HQ-OAR-2010-0799-9569-A1, p. 5]

Further, Volkswagen explained that there are many uncertainties regarding the market acceptance, cost and benefits of technologies such as hybrids, plug-in hybrids, lightweight materials and advanced combustion engines. It was also Volkswagen's position that stringency in the later phase of 2022-2025 could possibly be adjusted upward or downward following a midterm review that would provide more certainty over the cost, benefit and market forces surrounding more advanced technology. [EPA-HQ-OAR-2010-0799-9569-A1, p. 5]

In summary, Volkswagen's principles offered an equitable regulation driving aggressive reductions from the entire light-duty vehicle market. Importantly, the Volkswagen framework did not penalize an auto manufacturer who is more focused on the passenger car market versus large work trucks. We also believed that footprint curves based on equal stringency regardless of footprint size did not penalize smaller trucks. [EPA-HQ-OAR-2010-0799-9569-A1, p. 5]

Volkswagen contends that a regulation with equal stringency for both cars and trucks and with equal stringency across all footprints would result in a regulation that does not encourage manufacturers to increase footprint or change vehicle classifications. Achieving equal distribution would help assure that manufacturers focusing on passenger cars would continue to market or even expand this segment. Volkswagen also contends that a regulation structured in this manner does not place additional burden on affordable high volume vehicles that already save the most CO_2 per market segment. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 5-6]

a. Requires a stringency only for passenger cars that exceeds what Volkswagen predicted as a would be a both feasible and balanced requirement;

b. Fails to provide equal treatment for all vehicles by requiring higher stringency for cars and lower for trucks;

c. Continues with aggressive requirements beyond 2021 based on critical assumptions about the market and technologies which are simply too uncertain to appropriately comprehend; [EPA-HQ-OAR-2010-0799-9569-A1, p. 6]

With the publication of the SNOI and the subsequent NPRM, the agencies essentially followed the Volkswagen vision for reduced stringency in the first phase of the regulation (see Section 1.1a). However, this only applied to the highest CO_2 emitting segment of the light-duty fleet, trucks. Larger trucks in particular were provided with minimal CO_2 reduction requirements through the early years of the proposal. [EPA-HQ-OAR-2010-0799-9569-A1, p. 6]

The combination of lower stringency for larger trucks, combined with segment exclusive credit opportunities has the potential to distort the future light duty vehicle market. The agencies have disputed this claim, stating that work trucks have special needs and are challenged by the regulation even at the proposed stringency. In fact the agencies have contended that the work truck stringency is so great that even at the proposed levels they expect work truck manufacturers to earn credit in the passenger car segment and transfer that credit to the truck segment to assist truck segment compliance. If this is the case the agencies could have still created a regulation that was more equitable with equal stringency for cars and trucks. A regulation with stringency in the range of 4% for both segments would have resulted in extra credit in the passenger car segment that would have afforded work truck companies additional credit they could transfer to the truck category to offset the increased stringency of a balanced regulation compared to the lower stringency for trucks as proposed in the SNOI and NPRM. Volkswagen will expand on this argument in the comments that follow. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 6-7]

In summary, Volkswagen is concerned that the proposal will result in significant competitive inequity and will create market distortions affecting consumer purchase decisions. Furthermore, the proposal disproportionately impacts manufacturers who market primarily passenger cars while in turn benefitting producers of higher emitting large trucks. [EPA-HQ-OAR-2010-0799-9569-A1, p. 7]

Consumers ultimately will select a vehicle which best balances their needs and wants with affordability. The market has evolved to include a broad set of vehicles with a wide variety of features and emissions. In spite of the regulations, the choices people make when selecting a vehicle will have the most influence on the overall light duty carbon emissions. [EPA-HQ-OAR-2010-0799-9569-A1, p. 7]

Volkswagen understands that many consumers will continue to demand the utility provided by large trucks and pick-ups, either due to work or family requirements. Indeed, once again, two of the top-selling vehicles in the United States remain full-size pick-up trucks. Far into the future, the utility of these vehicles will continue to make them attractive to consumers. However Volkswagen feels that trucks and cars should be held to an equal percent burden for CO_2

reduction. Large trucks and pick-ups should not be singled out and provided a lesser requirement. [EPA-HQ-OAR-2010-0799-9569-A1, p. 7]

Volkswagen contends that the policy reflected in the NPRM may disproportionately drive cost into passenger cars versus trucks and may ultimately discourage customer consideration of lower CO_2 emitting passenger cars. Market segments should compete on the merits of their utility and affordability. Environmental regulations such as this CO_2 and fuel economy proposal should not at the very least create an unintended benefit for higher emitting trucks. This seems counterintuitive to environmental and energy goals. [EPA-HQ-OAR-2010-0799-9569-A1, p. 7]

Volkswagen will further expand upon our positions within these comments and will offer a series of amendments aimed at improving the overall framework of the proposal. Clearly, we would like to see a more balanced approach that equalizes the compliance burden across the industry. In addition we will offer proposals to modify the flexibilities to recognize a broader set of technologies and be available to other market segments. [EPA-HQ-OAR-2010-0799-9569-A1, p. 7]

As discussed previously, the Volkswagen Group maintains that the stringency and credit inequities within this proposal create a serious competitive disadvantage for Volkswagen. The framework of the proposal does not align with our key principles for a balanced program. [EPA-HQ-OAR-2010-0799-9569-A1, p. 7]

The following sections highlight the implications of such an inequitable proposal. Much of the competitive disadvantage for Volkswagen stems from the fact that Volkswagen as a group has the highest percentage car/truck split of any larger manufacturer (80% cars/20% trucks) in the US market. As a result, our fleet will be subjected to the most stringent standards, without the benefit of several key credits being offered to higher-emitting segments. This is in spite of the fact that due to the high percentage of passenger cars, Volkswagen has some of the lowest corporate emissions. Volkswagen remains unconvinced that a fleet composed primarily of lower-emitting passenger cars should be subjected to the most stringency standard, and carry such a disproportionate burden for CO_2 reduction. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 7-8]

Volkswagen is concerned that the differences in stringency levels between passenger cars and trucks as proposed within the NPRM creates an inequity in the projected corporate targets that each manufacturer must meet. What is immediately evident is that manufacturers who market a larger percentage of passenger cars versus light trucks will face a more challenging compliance outlook. The practical effect is that passenger car focused manufacturers will face a higher cost of compliance and will be at a price disadvantage in the marketplace. The resulting disparity amongst manufacturers is illustrated in some of the analysis included within the RIA. [EPA-HQ-OAR-2010-0799-9569-A1, p. 8]

Chapter 3 of EPA's RIA provides projections for car and truck targets for major manufacturers for the proposal and several other alternative scenarios. Volkswagen analyzed Table 3.8-3 from the RIA which provides EPA's projections through 2021. Disregarding several niche manufacturers (Aston Martin, Lotus, etc) it is apparent from the table that the proposal creates a higher burden on Volkswagen compared to many of the larger manufacturers, especially those with truck-centric fleets such as Ford or GM. [EPA-HQ-OAR-2010-0799-9569-A1, p. 8]

As shown below in Table 2-1, Volkswagen's 2021 car target is projected by EPA to be 167 g/mi CO_2 which is 6 g/mi less than the fleet average. When compared to manufacturers such as GM or Ford, Volkswagen's target is expected to be 9-10 g/mi more stringent. Volkswagen's truck target shows a similar situation. [See Table 2-1 on p. 8 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 8]

However analyzing the car and truck fleet separately does not show the full extent of the disparity. Table 2-1 also shows the combined sales weighted average target projected by EPA and further calculates the car/truck sales mixture. The car/truck split was not shown in the RIA, but can be derived from the individual compliance fleet and combined fleet target. [EPA-HQ-OAR-2010-0799-9569-A1, p. 8]

Table 2-1 shows Volkswagen having a combined sales weighted target of 184 g/mi. EPA is estimating Volkswagen to continue into the future with an 80% PC and 20% light truck share. This is consistent with Volkswagen's sales history and current projection. [EPA-HQ-OAR-2010-0799-9569-A1, p. 8]

Ford and GM are shown to have approximate sales weighted targets of 205 and 218 g/mi respectively. This is 21 and 34 grams less stringent when compared to Volkswagen. Furthermore, it appears that the combined fleet averages for these two OEMs were made assuming only 49% truck penetration for GM and 33% truck penetration for Ford. Volkswagen notes that these levels of truck penetration are far less than GM and Ford's current and historic sales split between PC and LT. For example, Ford's 2011 truck share was approximately 63% of their total sales, nearly one-third of which is the F150. GM's truck market share was estimated at 65% based on 2011 sales data. Projections for major manufacturers are illustrated below in Figure 2-1. [See Figure 2-1 on p. 9 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 8]

Volkswagen is concerned that the car/truck split assumed for different manufacturers may be unlikely to prove accurate. As illustrated in Table 2-2, had the EPA RIA calculation applied a truck estimate more consistent with market trends for both Ford and GM, the combined sales weighted fleet average would have approached 232 and 227 g/mi. This would further expand the disparity between corporate standards, resulting in Volkswagen being held to a 46 g/mi more stringent standard. This is 25% disparity in corporate target levels. This additional 46 g/mi translates into approximately 9 metric tons of additional CO_2 emissions per vehicle sold by these manufacturers than by Volkswagen. [See Table 2-2 on p. 9 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 9]

Volkswagen recognizes that the agencies are privy to confidential product plans supplied by manufacturers and that the agencies rely on this data to support future projections. However, the US has been averaging a near 50/50% split between cars and trucks for many years. Even at times of peak gasoline prices experienced during the past few years, interest in light trucks may have waned, however not to such a drastic extent as indicated by this radical shift in future product plans. Most disturbing is the recent trend back to light trucks even with fuel prices stabilizing near record highs. Volkswagen sees no evidence that would suggest a near 30% decline in truck market share from domestic OEMs. [EPA-HQ-OAR-2010-0799-9569-A1, p. 9]

Volkswagen is not privy to strategic plans by competitors, but we find it unlikely for OEMs historically focused on truck sales to so readily abandon what has proven to be a successful and profitable market segment. Dropping 30% truck share for a company like Ford would be equivalent to Ford cancelling their entire line-up of F150s, a vehicle which has remained a top, if not the top, seller in the US for many years. In addition, the proposals preferential treatment for large trucks and pick-ups further makes it unlikely that manufacturers would now prefer to market cars. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 9-10]

NHTSA states in the NPRM that 'the increases in technology application necessary to achieve the projected improvement in fuel economy will entail considerable monetary outlays'. Volkswagen agrees. NHTSA further estimates that the program will require a combined car/truck industry outlay of approximately $157 billion for 2017 through 2025. What is lost in the broad statement is the disparity in investment required for cars versus trucks. As shown in below in Table 2-3, the outlay for passenger cars far outweighs the investment required by light trucks. [See Table 2-3 on p. 10 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 10]

It is again important to stress that even within the truck segment, the stringency varies significantly. The investment data was not disaggregated to reflect investment requirements within the truck segment. Given the minimal requirement on larger trucks, Volkswagen must assume that the bulk of the truck investment shown in Table 2-3 is most likely concentrated amongst smaller trucks and SUVs. [EPA-HQ-OAR-2010-0799-9569-A1, p. 10]

The resulting cost increase disparity amongst manufacturers further illustrates the inequity of the program. As shown in Table 2-4, by 2021 the cost to Volkswagen per car as a result of the 2012-2016 and 2017+ regulation will exceed over $3300 per car. This is more than double the expected price increase for the fleet as a whole. [See Table 2-4 on p. 10 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 10]

Volkswagen continues to support a 4% per year stringency reduction from both passenger cars and light trucks as being the best balance between environmental objectives and market acceptance. However, given the commitments made by stakeholders to the overall framework provided within this proposal, Volkswagen offers the following amendments. [EPA-HQ-OAR-2010-0799-9569-A1, p. 26]

Volkswagen continues to support the concept that equal percent reductions in the order of 4% per year can be applied to both the car and truck fleet. In addition, the percent reduction for each fleet can also be equally applied across all footprint sizes. However, as mentioned above, given the extensive commitments made by stakeholders to the SNOI, Volkswagen finds it unlikely that the agencies will incorporate our principle for equal reductions from all cars and trucks. [EPA-HQ-OAR-2010-0799-9569-A1, p. 27]

Provide an alternative CO_2 reduction pathway for passenger cars which could provide needed flexibility and incentives to the segment of the fleet being most challenged with the highest annual CO_2 percent reductions (5% per year for Cars); [EPA-HQ-OAR-2010-0799-9569-A1, pp. 2 and 4]

The NPRM requires on average a 5% annual improvement in CO_2 emissions from passenger cars. This task is spread equitably across the footprint range of cars. Figure 2-2 illustrates yearly CO_2 targets for cars at the upper cut-point (56 ft2), lower cut-point (41 ft2) and EPA projected average car footprint (45 ft2). During the course of technical discussions with agency staff, Volkswagen supported a 4% annual percent reduction for passenger cars. Volkswagen based this position on both technical and market evidence. [See Figure 2-2 on p. 11 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 11]

EPA has predicted that over the lifetime of passenger cars covered by this rulemaking, the increasingly more stringent targets for cars will offset upwards of 1.2 billion metric tons of CO_2. Light duty trucks which on average face 3.5% annual CO_2 reduction will contribute approximately 800 million metric tons of reduction. [EPA-HQ-OAR-2010-0799-9569-A1, p. 11]

EPA predicts that during the 2017-2025 timeframe, the fleet will comprise of roughly 65% passenger car and 35% light truck. This is according to vehicle classification as defined by NHTSA. Figure 2-3 illustrates an example of EPA's projected MY2020 fleet distribution along with the accompanying CO_2 inventory by segment. [See Figure 2-3 on p. 12 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 11]

When normalized on a percent basis of per vehicle emissions (including VMT), passenger cars are expected to carry a higher burden of reduction as shown in Table 2-5. [See Table 2-5 on p. 12 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 12]

What is apparent in this data is that passenger cars are underweighted in emissions relative to their market share and trucks are overweighed in emissions. There is a value to the environment in promoting passenger cars and not incentivizing a move towards trucks. Incentivizing a shift away from cars and towards trucks will have a contradictory effect on the overall program GHG reductions. [EPA-HQ-OAR-2010-0799-9569-A1, p. 12]

The NPRM extends aggressive reductions for passenger cars into the 2017+ timeframe. Less demanding reductions are required for trucks. As discussed previously, Volkswagen contends that this will create market distortion and an incentive for a manufacture to reconsider future plans. In order to minimize the impact that this inequity could have within the market, an alternative pathway could be tailored to encourage manufacturers to continue offering cars, especially economy models which may otherwise have become less attractive in the marketplace. [EPA-HQ-OAR-2010-0799-9569-A1, p. 26]

Volkswagen proposes that EPA and NHTSA supplement the NPRM by including an alternative passenger car percent annual CO_2 reduction pathway. This pathway could consist of a series of annual reductions applied throughout the time period of the rule in lieu of the 5% per year currently proposed. Volkswagen believes that a combination of annual percent reductions can be determined which could help provide additional flexibility for passenger car fleets. [EPA-HQ-OAR-2010-0799-9569-A1, p. 26]

In principle, the concept of an alternative pathway would include a combination of lower percent reductions in early years coupled with increasing reductions in later years should technology and market factors make this feasible. Indeed this is similar to the treatment being afforded to the truck fleet. Volkswagen asks that a similar approach be offered for cars. [EPA-HQ-OAR-2010-0799-9569-A1, p. 26]

In addition to the alternative pathway being a compliance flexibility, Volkswagen believes it could also serve as an incentive to promote and provide support for the passenger car fleet. Volkswagen believes that a pathway could be developed which would provide support to low-emitting passenger cars to the same degree that other market segments, are being incentivized through their unique credit programs. As an example, the agencies could benchmark the degree of support being provided to full-size trucks. We contend that this is a reasonable approach and would not amount to an excessive 'loophole' or 'give-away' since it would be consistent with flexibilities found to be useful elsewhere. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 26-27]

d. Requires unequal % CO_2 reductions across the truck fleet --large trucks are benefited with minimal requirements; [EPA-HQ-OAR-2010-0799-9569-A1, p. 6]

Volkswagen maintains our original position that 4% per year for both cars and trucks has the most potential to create a balanced, effective proposal. Further, our suggestion is that the 4% reduction be equally applied to all sizes of vehicles within each compliance category. EPA claims that the average truck stringency for 2017-2025 is approximately 3.5% per year. This is less than the average reduction suggested by Volkswagen. In addition the 3.5% is a broad characterization of the burden being applied to the truck category as a whole. Volkswagen points out that upon closer examination the 3.5% is not equally applied across the whole category. As illustrated in Table 2-7, it is clear that large light trucks are provided significantly lower percent reduction stringencies when compared to the projected average sized truck, or a small truck with a footprint closer to the lower curve cut-point. [See Table 2-7 on p. 19 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 18]

This is especially evident within the first several years of the program when the stringency for larger trucks hovers around or even less than 1%. The least efficient vehicles offered in the market will be given at three years before any significant increases in efficiency are required. [EPA-HQ-OAR-2010-0799-9569-A1, p. 19]

The result is inequitable compliance obligations for various types of trucks. Figure 2-8 illustrates the decreasing CO_2 targets in g/mile CO_2 for trucks at the lower and upper footprint ranges. The dashed lines illustrate a forward trending projection of the 2012-2016 stringencies carried forward into the 2017-2025 timeframe. [See Figure 2-8 on p. 19 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 19]

In general for the smaller trucks, the reductions for 2017-2025 are roughly in line with the reduction trend from 2012-2016. However, for the larger light trucks, the proposed targets deviate away from the 2012-2016 trend line becoming less stringent on a percent basis. The blue shaded area is a representation of the pullback in the stringency provided for these vehicles. Further, the green shaded area in Figure 2-8 includes the additional credits available explicitly to 'game changing' full-size pick-up trucks that compose the majority of vehicles populating this footprint range, i.e. the full-size trucks credits. These credits further expand the area of the shaded region, increasing the gap between small and large trucks even further. [EPA-HQ-OAR-2010-0799-9569-A1, p. 20]

It is important to note that the top two selling vehicles for 2011, the Ford F150 and Chevrolet Silverado, with combined sales of nearly 1 million vehicles (approximately 8% of the entire US market light duty market) will be eligible to reside within the blue and green region of Figure 2-8. [EPA-HQ-OAR-2010-0799-9569-A1, p. 20]

The shaded region in Figure 2-8 not only represents competitive inequity, but also lost opportunity for CO_2 reduction from the very segment of the fleet with the highest emissions. Volkswagen acknowledges that vehicles within this footprint range may feature duty-cycles which may preclude adoption of certain fuel saving technologies or features, i.e. heavy duty towing or off-road capability. This however is not a unique challenge limited to vehicles with larger footprints. Smaller SUVs or trucks in some cases may feature near equal capability and consumers are no less demanding to this segment versus others. [EPA-HQ-OAR-2010-0799-9569-A1, p. 20]

Some stakeholders have claimed that the latter half of the 2012-2016 rule created an excessive stringency on larger light trucks, and that these vehicles were somehow more challenged than other vehicles. The lower stringency being proposed for 2017-2025 is intended to provide 'breathing room' to allow time for the larger trucks to catch up with the requirements. Volkswagen disagrees. We again refer to Table 2-7 which clearly shows for 2012-2016 that larger trucks already benefited from lower percent requirements compared to less-emitting smaller trucks and SUVs. In addition, the RIA indicates that a leading full-size truck already available in 2011 is close to being compliant with standards for the 2017+ timeframe. [EPA-HQ-OAR-2010-0799-9569-A1, p. 20]

Table 3.12-1 in the EPA RIA showcases vehicles which are at or near compliance with the 2017+ expected targets. Included in this list is a non-hybridized version of a large pick-up truck which remains the number one selling vehicle in the US, selling over 500,000 units per year. EPA’s data indicates that the 2011MY of this vehicle achieves 372 g/mi and has about a 4% gap from complying with its 2017 targets. EPA included assumptions regarding A/C credit usage in making this determination. [EPA-HQ-OAR-2010-0799-9569-A1, p. 20]

Volkswagen created an internal model to project the CO_2 performance of this vehicle. The model disaggregated the sales into various powertrain and wheelbase (affects footprint) combinations as shown in Figure 2-9. For simplification, all the pathways are not shown. The model then applies publically available EPA fuel economy and CO_2 emissions data for each of the resulting pathways and compares them with the resulting footprint target which varies based on wheelbase. Some of the combinations earn credits, while others earn debits. The compliance of the model as a whole was then determined assuming credit transfer amongst the powertrain/footprint combinations. [See Figure 2-9 on p. 21 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 20]

The RIA compares current model year performance with the expected footprint target for 2017 and beyond. For this sample vehicle, EPA claims that the truck will fall short of its target by 4%. This assumes that the vehicle receives no fuel saving technology upgrades from 2011 to 2017. Volkswagen's calculations confirms the claim that the stringency imposed on this vehicle by the 2012-2016 program indeed is challenging in the later years and results in a debit for 2015 and 2016. However, it should be noted that the vehicle earns credits in 2012 and 2013 sufficient to cover the debits in 2015 and 2016. Regardless, the credits would be consumed and the vehicle still faces a shortfall beginning in 2017. [EPA-HQ-OAR-2010-0799-9569-A1, p. 21]

What is important to consider is that the RIA shortfall assumes no application of fuel saving technology from 2011 to 2017, a full seven years. Volkswagen exercised the model by using two pathways to apply fuel saving technology. The first was to apply an average annual improvement for each model year, using the average of 1-2% per year as has been claimed in the past as a reasonable annual improvement in fuel economy. The other pathway recognizes that improvements may not necessarily be made on an annual basis and instead are applied in incremental steps at regular redesign intervals. For this pathway Volkswagen applied a suite of low-cost technologies4to the vehicle using EPA assumed costs and effectiveness and waited until 2017 to make the update. This provides a five year design cycle assuming the sample truck was potentially redesigned in 2011. An additional application of technologies is made in 2022, again providing for a 5-year design cycle. The approach results in an average year-over-year reduction of 1.2%. [EPA-HQ-OAR-2010-0799-9569-A1, p. 21]

Furthermore, Volkswagen refrained from assuming any adoption of HEV technologies for this vehicle. Assuming that the minimum deployment thresholds are met, this would have triggered the 'game changing' technology credit of 10 or 20 g/mi CO_2 depending on the degree of hybridization. Volkswagen did not include the HEV incentive because the model showed that the credits were simply not needed. Either of the conventional technology pathways provided significant compliance margins resulting in the pick-up truck generating credits throughout most of the 2012-2025 timeframe. The HEV incentive would have only 'piled on' to the credits being earned resulting in a windfall for this vehicle. Unless the credits were needed in another segment of the fleet, they would not be worth the investment required to earn them. [EPA-HQ-OAR-2010-0799-9569-A1, p. 21]

However, EPA has stated in the NPRM that it is their understanding that credits will only be transferred from cars to trucks and not vice-versa. Therefore, one can expect limited to no hybridization of this full-size truck. This does create doubt regarding the need to create the full-size truck credit incentive for 'game-changing' technologies. [EPA-HQ-OAR-2010-0799-9569-A1, p. 22]

Modest application of conventional technologies to full-size pick-ups, coupled with the benefit of low annual CO_2 reduction requirements, more than provides for a comfortable compliance margin for this segment of the fleet. Volkswagen questions why the other segments of the truck fleet, let alone the car fleet, must then be taxed with the role of carrying the more significant CO_2 reduction burden? [EPA-HQ-OAR-2010-0799-9569-A1, p. 22]

As discussed in Section 2.7, Volkswagen predicts that credits will be accumulated within the large truck and full-size truck segment due to the combination of lower stringency and segment exclusive benefits. Should this occur, then the fundamental premise upon which the reduced stringencies and unique credits are based will need to be reevaluated. [EPA-HQ-OAR-2010-0799-9569-A1, p. 27]

On the other hand, the NPRM and other stakeholders have claimed that large trucks face the most challenging reductions. Volkswagen disagrees. However, even if this proves to be true, then large trucks would be at or above their CO_2 g/mi targets, and would be mired in debits. Credits earned by this segment simply would not exist. Therefore there is no need for non-existent credits to be bankable or transferable to other segments. [EPA-HQ-OAR-2010-0799-9569-A1, p. 27]

Either way, large trucks, by claiming to be more uniquely challenged than any other segment of vehicles covered by this regulation are being afforded significant benefits not awarded anywhere else. It is therefore reasonable that the agency confine the reach of the benefit within the large truck segment which is demanding it. What is unreasonable is to claim such a degree of excessive hardship as to warrant less than one-fifth the stringency requirement of other segments and then expect that benefit to be transferable. [EPA-HQ-OAR-2010-0799-9569-A1, p. 27]

---

2 EPA projects the average footprint for trucks at approximately 53.5 sq-ft for MY2017-2025.

3 The upper cut-point of the Light Truck curve changes throughout 2017-2025, therefore VW used 72 sq-ft as a representation of vehicles near or above the upper cut-point. This is the footprint of a major large pick-up truck representative of vehicles within this class.

4 The technologies include electric power steering (EPS) + improved accessories (IAAC1) + aggressive shift logic (ASL-1) + low rolling-resistance tires (LRRT) + and low-drag brakes (LDB). Total cost was less than $300 and VW expects that this selection of technologies is neither complicated by synergy effects nor degrades towing and off-road capability, except possibly for the LRRT which may then be an option. MY2022 applies level-1 mass reduction (MR-1) and a high efficiency gearbox (HEG).

Organization: Weiner, L.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 107.]

Additionally, in the early years of the proposed standards, pickup trucks are not required to improve with the same rate as passenger cars, but there are incentives for manufacturers to apply advanced technologies to pickup trucks. So it's critical that the efficiency of the trucks not lag behind cars.

Organization: Whitefoot, K. and Skerlos, S.

To reduce the incentives to upsize the passenger car and light truck fleets, the slopes of the fuel economy curves for passenger cars and light trucks should be flattened with corresponding changes made to the CO_2 curves. [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

Our recent analysis (attached) suggests that manufacturers likely have a profitable incentive to upsize their vehicle fleets in response to the footprint-based standards, through a combination of adjusting prices to shift production to larger vehicles and increasing vehicle footprint during redesign. [See the attachment in Docket number EPA-HQ-OAR-2010-0799-9447-A2] [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

NHTSA and EPA should develop a model to analyze profitable incentives to upsize the vehicle fleet in response to the footprint-based standards. [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

The analysis also indicates that the incentive to upsize is greater for light trucks than for passenger cars, encouraging a further divergence of the sizes of these two classes. [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

The slope for the light truck curves should be flattened by a larger percentage than the slope of the passenger car curves to reduce the incentive to upsize light trucks to a larger extent than passenger cars. [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

Minimum standards for light trucks should be set at a high-enough level to ensure that fuel economy improvements in the total fleet are close to projected levels even if the production of light trucks increases relative to passenger cars. [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

NHTSA and EPA should conduct sensitivity analyses of consumer preference scenarios on projected improvements of fuel economy and GHG emissions. [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

Incentives to upsize the vehicle fleet

While we understand that NHTSA and EPA wish to reduce incentives to downsize the vehicle fleet, we believe that the proposed standards overshoot that goal and actually create incentives to upsize the fleet. We recently conducted an analysis, published in Energy Policy, which tests the hypothesis that the footprint-based fuel economy standards do not create a profit incentive for manufacturers to increase the average size of their vehicle fleet (attached). The analysis considered a very large range of average consumer preferences for vehicle size, fuel economy, and acceleration performance so that the set of plausible scenarios of consumer preferences are captured in the analysis. The findings indicate that the incentive for manufacturers to upsize their fleets exists over almost all of these scenarios. Only in the scenarios where average consumer preference for footprint is very low ($340 per sq ft) and average preference for acceleration performance is very high ($5,500 per 0.01 hp/lb) do the results indicate an incentive to slightly downsize the fleet. In all other scenarios, the incentive to upsize the fleet leads to substantially (5-15%) higher fuel consumption and GHG emissions than would have otherwise been achieved without an incentive to upsize the fleet. Furthermore, the analysis indicates that the incentive to upsize is larger for light trucks than for passenger cars, increasing the divergence of sizes of these two classes. This finding needs to be considered from the traffic safety perspective since the relative size of vehicles in collisions is an important risk factor. [See the attachment in Docket number EPA-HQ-OAR-2010-0799-9447-A2] [EPA-HQ-OAR-2010-0799-9447-A1, p. 2]

The results of our study suggest that the risk of backsliding during MYs 2017-2025 is substantial. Therefore, we encourage NHTSA and EPA to revise the standards to reduce the incentives to upsize the U.S. vehicle fleet. The slopes of the fuel economy curves for passenger cars and light trucks should be flattened (with corresponding changes made to the CO_2 curves) to reduce incentives for manufacturers to upsize their passenger car and light truck fleets. [EPA-HQ-OAR-2010-0799-9447-A1, p. 2]

Furthermore, the fuel economy curve for light trucks should be flattened to a larger extent than the passenger car curve to reduce the incentive to upsize light trucks even further than passenger cars, thereby increasing the divergence of vehicle size between these two classes. [EPA-HQ-OAR-2010-0799-9447-A1, p. 2]

Unfortunately, the proposed rule increases the risk of backsliding by making the MY2017-2025 light truck curves steeper than the MY2011-2016 curves. These steeper curves further raise the incentives to produce more light trucks overall (compared to passenger cars) and more large light trucks (compared to small light trucks). NHTSA and EPA state that the light truck curve was made steeper because large pickup trucks would be less capable of achieving further improvements in fuel efficiency without compromising load carrying and towing capacity. However, because the standards are fleet average standards, no specific vehicle must meet its target as specified by the curve. Therefore, efficiency improvements in smaller light trucks could offset the difficulties of improving fuel efficiency of larger light trucks. We encourage NHTSA and EPA to revise the light truck curves so that the risks of upsizing are reduced. [EPA-HQ-OAR-2010-0799-9447-A1, p. 2]

Improve analysis of incentives to upsize the vehicle fleet.

The risk of upsizing the vehicle fleet warrants a greater level of analysis. While NHTSA and EPA state that the fuel economy and CO_2 curves were chosen to minimize any incentive to increase or decrease vehicle size, no quantitative analysis is presented to support this. Potential incentives for automakers to upsize their vehicle fleet—by increasing sales of larger vehicles, or making vehicle models larger during redesign, or some combination—need to be carefully analyzed to ensure that the projected improvements in fuel economy and GHG emissions are realized. [EPA-HQ-OAR-2010-0799-9447-A1, p. 3]

NHTSA and EPA state that they do not consider any incentives to upsize the vehicle fleet in their analysis because they believe (1) that production shifts toward larger vehicles would run counter to market demand and (2) that redesigning vehicles to increase their footprint would be significant enough to be unattractive as a measure to take solely to reduce compliance burdens. However, the agencies do not provide any data to support that average vehicle footprint has been decreasing over time. By EPA's own data, production of small cars has been decreasing since the 1990's and production of large trucks has been increasing. 2 Furthermore, it is clearly difficult to predict future consumer preferences for vehicle size and other relevant vehicle attributes. Therefore, sensitivity analyses are needed to assess the impact of changes in consumer preferences on the projected improvements in fuel economy and GHG emissions. [EPA-HQ-OAR-2010-0799-9447-A1, p. 4]

We encourage NHTSA and EPA to develop a model to assess the risks of vehicle upsizing. The model should analyze manufacturers' profitable incentives to adjust vehicle dimensions as well as adjust the prices of their vehicles to shift production among their fleet. [EPA-HQ-OAR-2010-0799-9447-A1, p. 4]

---

1 Attribute-based standards can guarantee that the average fuel economy of the total fleet is at least as great as the lower-bound fuel economy of the light truck standard (the minimum fuel economy target assigned to any light-duty vehicle). However, in the proposed standards this value is only 25.25 mpg for MY2020. Requirements to set the standards such that they are technically feasible and economically practicable preclude raising this value to 35 mpg for MY2020. Therefore, the only way to ensure that the total fleet has a combined fuel economy average of 35 mpg by 2020 is to establish additional "backstops" in the standards.

2 U.S. Environmental Protection Agency. Light Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2009. EPA420-R-09-014. pp. 23-24. Available at http://www.epa.gov/otaq/cert/mpg/fetrends/420r09014.pdf

Response:

EPA received a significant number of detailed comments on the shape of the curves – many of which questioned the relative stringency of the car and truck curves, and maintained that they favor trucks at the expense of cars. Others commented that the slope of the curves will create incentives for manufacturers to upsize the fleet, or that the location of cutpoints will encourage downsizing of the smallest vehicles. Descriptions of the agencies' methods for determining curve slope, cutpoints, and relative car and truck stringencies are provided in sections II.C.4 and 5, section III.B.2, and sections III.D.6 and 7 of the preamble, and chapters 2.4.2, 2.5.1, and 2.5.2 of the joint TSD. Detailed responses to most of the comments received on these topics are provided in these sections, while a summary of these responses, along with additional information, is provided below.

Response to comments that the curves are too steep

ACEEE objected to the agencies' adjustments to the truck curves based on density, which together with the revised curve-fitting methodology (revised from the MYs 2012-2016 rule) had the result of increasing the truck curve slope for this rule. The commenter further stated that in the proposal, the EPA did not provide evidence that load-carrying and towing capability of full-size trucks might be compromised. The agencies have added an in-depth explanation of the justification for revising the curve fitting methodology in chapter 2.4.2.4 of the Joint TSD and III.D.6.c. The main points of this explanation are summarized here: In discussions with large truck manufacturers prior to the proposal, they expressed their belief (and EPA agrees) that the light truck standard should be somewhat steeper after MY 2016, primarily because, after more than ten recent years of progressive increases in the stringency of applicable CAFE standards, manufacturers of large pickups would have limited options to comply with more stringent standards. Given the relatively few platforms which comprise the majority of the sales at the largest truck footprints, inappropriately stringent standards for this important segment of the truck fleet would require overly aggressive advanced technology penetration rates. See preamble Table III-35 , where under alternative 2, we project that 20% of the light truck vehicle fleet will be MHEV or HEV (the projection is 18% MHEV) in MY 2021; . By comparison, the final rule is projected to be 13% MHEV & HEV (11% MHEV). In MY 2025, the rate of strong hybrid (HEV) technology more than doubles in the 20g more stringent alternative standard compared to the final standard (Table III-37)., The agencies were concerned at proposal, and remain concerned, about issues of lead time and cost with regard to manufacturers of these work vehicles. EPA further believes that inappropriately stringent standards could create an incentive for these manufacturers to choose to downpower, modify the structure, or otherwise reduce the utility of these work vehicles. Therefore, the agencies revised the curve-fitting methodology, and thus changed the slope of the truck curve from the curve shape in the MY 2016 standards, in order to provide a clearer path toward compliance for manufacturers of these vehicles, and reduce the potential that new standards would compromise utility characteristics such as load-carrying and towing capability.

While the comments do not dispute the validity of the curve-fitting method, or the appropriateness of considering the unique requirements of trucks, ACEEE objected to the contribution that these analysis techniques make towards achieving a policy objective, stating "we believe that adjusting the analytical approach to yield curves satisfying certain policy considerations is inadvisable. It would be preferable to choose the most robust analytical approach, and then to make exceptions as needed for a limited period to accommodate those policy considerations, and to explain the targets in those terms." ACEEE also stated that "subjectivity to the technical analysis invites unnecessary challenges to the standard-setting process". EPA notes that a curve fitting process such as the one conducted for this rule will inevitably involve choices between various reasonable approaches. EPA maintains that the approach used for this rule is both reasonable and appropriate. EPA appropriately considered factors of technology cost, feasibility, lead time, and consumer acceptance in applying the density adjustment to the truck curve, in order to achieve the policy goal of avoiding incentives for manufacturers to reduce the utility of their work vehicles. A more detailed response to ACEEE's comments on this topic are provided in section II.C.4.d of the preamble and chapter 2.4.2.4 of the Joint TSD.

ACEEE requested further clarification on specific text in chapter 2.4.2.10 of the Joint TSD, stating "It is also puzzling that the agencies' analysis shows that trucks' HP-to-weight ratio increases only slightly with footprint (TSD p.2-17), yet "pick-up trucks must be more powerful, than their low 'density' nature would statistically suggest." If pick-up trucks have high horsepower and low weight, their HP-to-weight ratios should be especially high. An explanation of this apparent contradiction would be helpful". In response, EPA's statistical analysis does indeed show that the HP-to-weight rations are especially high. This is not in contradiction with the observation that pick-up trucks must be more powerful than would otherwise be expected for a low density vehicle.

Whitefoot and Skerlos submitted their findings supporting commenters' contention that the proposed (and now final) curve shapes create an inherent incentive to upsize the fleet (which would dilute the rules' benefits), and recommended that the curve slopes be flattened to reduce this perceived incentive. This paper was referenced by other commenters (ACEEE, CBD, NACAA, Honda) in support of their comments urging a flattening of the curves. EPA recognizes the significant amount of effort that went into the analysis of Whitefoot and Skerlos, and considers that the concepts presented have potential merit. However, EPA notes that the authors assumed different inputs than the agencies actually used in the MYs 2012-2016 rule regarding the baseline fleet, the cost and efficacy of potential future technologies, and the relationship between vehicle footprint and fuel economy. Were the agencies to use the Whitefoot and Skerlos methodology with the actual inputs to the MYs 2012-2016 rules, it is likely that different results would be obtained from those in the Whitefoot and Skerlos study. Whitefoot and Skerlos acknowledged the potential uncertainty when interpreting their results: "designing footprint-based fuel-economy standards in practice such that manufacturers have no incentive to adjust the size of their vehicles appears elusive at best and impossible at worst." EPA recognizes that based on economic and consumer demand factors that are external to this rule, the distribution of footprints in the future may be different (either smaller or larger) than what is projected in this rule. However, EPA continues to believe that there will not be significant shifts in this distribution as a direct consequence of this rule.

CBD, in addition to citing the Whitefoot and Skerlos study, commented that the previous shift in the fleet from cars to trucks was the result of previous difference in car and truck stringencies, and that in this rule, "the fact that incentives for upsizing would be created simply cannot be disputed". EPA disagrees. While no single vehicle need meet its emissions target, for manufacturers to comply with these standards, efficiency improvements will be required of all vehicles, cars and trucks, large and small. The current standards are different from previous standards in terms of stringency, the use of a footprint attribute, and the lack of a provision allowing manufacturers to pay a penalty for noncompliance. We therefore do not believe it is justifiable to draw conclusions about manufacturers' responses to this rule based upon responses to previous flat CAFE standards.

IPI also maintained that the standards would encourage upsizing, and proposed that the curves should be flat. IPI is therefore suggesting that the GHG standard should not be attribute-based, although they acknowledged that EPCA/EISA expressly requires that CAFE standards be attribute-based and defined in terms of mathematical functions. For purposes of harmonization (in addition to the reasons articulated in TSD 2.1 and 2.2), EPA has also issued an attribute based standard. The agencies have concluded that a properly designed footprint-based approach provides the best means of achieving the basic policy goals, as outlined in section II.C.2 of the preamble, while not creating inappropriate incentives to increase or reduce vehicle size in ways that could increase fuel consumption and GHG emissions, or impact overall safety.

Response to comments that the cutpoints should be adjusted

IIHS expressed some concern that the location of the cutpoint at the lower extreme curve where footprint is smallest would encourage manufacturers to downsize vehicles at or below the cutpoint in order to gain additional credits. The commenter proposed that the cutpoint be moved further to left to reduce the likelihood of this type of downsizing. Global Automakers proposed setting the cutpoint for the smallest light trucks at approximately ten percent of sales (as for passenger cars) rather than at 41 square feet. The comments from IIHS and Global Automakers represent two opposing positions on the placement of the left cutpoints. EPA agrees with IIHS that moving the 41 square foot cutpoint to an even smaller value would additionally discourage downsizing of the smallest vehicles. However, as discussed in section II.C.5.a of the preamble, EPA believes that consumer preferences are likely to remain such that manufacturers will be unlikely to deliberately respond to today's standards by downsizing the smallest vehicles. For manufacturers, very small footprint vehicles create additional design challenges for the packaging of components and occupants, as well as the need for additional safety equipment to compensate for reduced crush spaces. In EPA's judgment, placing the lower cutpoints at 41 square feet for both car and truck curves continues to strike an appropriate balance between (a) not discouraging manufacturers from introducing new small vehicle models in the U.S. and (b) not encouraging manufacturers to downsize small vehicles. EPA will review trends in footprint size in the car and truck markets and reassess the appropriateness of the lower cutpoint position during the mid-term evaluation.

Several commenters maintained that placing the right cutpoint for trucks at 74 square feet (compared to 66 square feet in the MYs 2012-2016 rule) would reduce stringency for these vehicles (ACEEE) and possibly encourage upsizing (Sierra Club, Volkswagen), even though there is no safety-related reason to discourage downsizing of these trucks. ACEEE went on to point out that in the MY2012-2016 rule, the agencies rejected requests to increase the cutpoint from 66 square feet. EPA agrees that the approach used in this rule is different from the curve fitting approach used in the MY2012-2016 rule. As a result of this revised curve fitting approach, we now account for more truck models that have footprints greater than 66 square feet. Specifically, as described in chapter 2.4.2.10 of the Joint TSD, some models of pickup trucks which, for example, are available in different cab configurations with different wheelbases, have been disaggregated for this rule and are represented individually, which leads to a slightly different outcome in the regression results than had they remained aggregated.

Two commenters suggested that the agencies provide an alternate emissions target for light trucks larger than 60 square feet (Sierra Club) or 66 square feet (ACEEE) that exceed the sales projected in the rule. In response, in EPA's judgement, there is minimal risk that manufacturers would respond to this upward extension of the cutpoint by deliberately increasing the size of light trucks that are already at the upper end of marketable vehicle sizes. Such vehicles have distinct size, maneuverability, fuel consumption, storage, and other characteristics, and are likely not suited for all consumers in all usage scenarios. Further, larger vehicles typically also have additional production costs that make it unlikely that these vehicles will become the predominant vehicles in the fleet. For this reason, and others described in section

II.C.5.b of the preamble and chapter 2.5.2 of the joint TSD, the EPA does not expect that gradually extending the cutpoint to 74 square feet will create incentives to upsize large trucks. Therefore, EPA does not believe that the suggested provision of an alternate emissions target for the largest light trucks that exceed projected sales is warranted.

Response to comments on the difference in car and truck stringencies

The comments on the relative car and truck stringency were largely divided between NGOs and OEMs that were concerned with the shape and relative rate of increase of the truck curve, and OEMs who expressed concern about their ability to comply with a large truck standard that continued to increase in stringency at the rate of the MY 2016 standard.

ICCT and CBD commented that the lower annual rate of improvement for light trucks from MYs 2017 to 2021 will potentially undermine the benefits of the rule. CBD went on to state that the consideration of the unique attributes of trucks "does nothing to explain the lack of the required ratable annual increases", and that "the rulemaking demands the least from the most profitable segment of the automotive industry". CBD further stated that there is no showing that light trucks, including pickups, cannot both preserve hauling and towing utility and achieve aggressive fuel economy. Toyota similarly commented the standards require "virtually nothing of the largest vehicles on the road". EPA disagrees with this assessment for the reasons below.

First, as explained in preamble section III.D.6.b, we project relatively little trading between the car and truck fleets (and vice versa). From the reference case emission level for combined car and truck fleets (sales weighted average of approximately 250 g/mile) to the control case (sales weighted average of approximately 163 g/mile) is a drop of approximately 90 g/mile. In this context, 4 g/mile of credits transferred from the truck fleet to the car fleet is relatively small. Disproportionate credit transfers would indicate a lack of balance in relative stringencies of the standards, but we see the opposite. This demonstrates an appropriate balance between car and truck stringencies. Moreover, in response to CBD, we agree that fuel economy, GHG emissions control, and preserving hauling and towing utility are not mutually exclusive. Indeed, EPA's methodology for assessing costs includes costs to preserve those utilities and to implement emission control/fuel economy technology. However, EPA remains concerned about adopting standards creating strong incentives for manufacturers to choose to reduce hauling and towing capacity as a compliance strategy. Of equal or greater significance, EPA has identified legitimate concerns with available lead time, especially through MYs 2017-2021, reflecting that the large truck segment is dominated by relatively few vehicle platforms with relatively large sales, and this limited number of vehicle platforms makes rapid technology changes a greater challenge than in other market segments. This is partly due to the lack of platform sharing, a flexibility that smaller vehicles have.[2] The pick-up trucks also tend to have longer redesign

[2] Although certain intermediate volume manufacturers, especially in the luxury car market, also have a relatively smaller number of platforms (relative to larger manufacturers), EPA believes the concerns are more acute with respect to work trucks, in part because these vehicles serve special needs (small businesses, ranchers, farmers, etc.) and that it is important

cycles, as discussed in section III.D.6.c of the preamble. The utility requirements of pick-up trucks relative to smaller vehicles results in longer development times for validation of a new platform. Pick-up truck product validation occurs across a broader range of gross vehicle weights for each platform due to a relatively large payload capacity and can include validation of trailer towing capability for multiple trailer configurations. There are also issues of consumer acceptance of the most advanced technologies in the larger light trucks. See generally preamble section III.D.6.

Second, as described in section III.D.6.c of the preamble, the year-to-year stringency of the standards were set with consideration of the technical challenges involved in applying efficiency technologies to these vehicles as well as lead time concerns in the early years of the programs. Additionally, even with these considerations, the trend of a gradually widening gap in the early model years of the rule is reversed during the MY 2021-2025 period, as described in detail in section III.D.7 of the preamble. EPA believes that the increase in stringency for the truck standard in the latter phase of the rule is a reasonable approach for avoiding a large gap between car and truck curves while also taking account of the challenges of implementing efficiency technologies in trucks during the first phase of the rule. Furthermore, the promulgated standards promote similar levels of emission reductions for smaller trucks and for cars of the same size. For example, the average year-to-year increase in the target level over the entire MY 2017-2025 period is identical for cars and trucks at the 41 sq. ft. curve cutpoint (5.1 percent per year), and is nearly the same over the initial MY 2017-2021 period (4.8 and 4.5 percent per year, for cars and trucks, respectively.) In addition, as shown in preamble Table III-57, by MY 2025 the gap for larger footprint vehicles is at levels similar to the MY 2012-2016 rule, while for smaller footprint vehicles, the gap is less than during the MY 2012-2016 rule.

ACEEE, citing Table III-53 in the NPRM, also questioned how the proposed standards, finalized by this rule, could be superior to the alternatives given the cost differential between cars and trucks in MYs 2017-2020. Similarly, Honda and Consumers Union cited the lower fleet average compliance cost for trucks as evidence that the truck standard is not stringent enough (or from Honda's comments, for large trucks, in particular).

EPA does not agree that it is necessarily preferable to have equal compliance costs for cars and trucks in each model year. EPA notes that while compliance costs are initially lower for trucks than for cars, the costs increase relatively faster for trucks in the latter phase of the rulemaking, as shown in Table III-56 and Figure III-5 of the preamble. The lower initial cost for trucks is a reflection of the lower initial stringency (relative to cars), which as discussed above, and in sections III.D.6.b and III.D.7 of the preamble, is due to considerations of the technical challenges and lead time concerns involved in applying efficiency technologies to these vehicles. As Ford Motor Co. noted in its comments: vehicles equipped with trailer tow packages include

---

that this basic market demand not be jeopardized. See International Harvester v. EPA, 478 F. 2d 615, 640 (D.C. Cir. 1973) (EPA required to consider issues of basic demand for passenger vehicles in making technical feasibility and lead time determinations; however, EPA need not accommodate every single model type) additional features that clearly distinguish them from passenger cars, and can negatively impact fuel economy:, including auxiliary transmission oil coolers, upgraded radiators, trailer hitch connectors and wiring harness equipment, different steering ratios, upgraded rear bumpers and different springs for heavier tongue load (for upgraded 'max' trailer tow packages), body on frame (vs. unibody) construction to support capability and an aggressive duty cycle, lower axle ratios for better pulling power/capability, and greater aerodynamic drag. Even for trucks with the same or similar footprint to cars, these features result in greater costs and technical challenges to apply GHG emission control/fuel economy technology.

Therefore, EPA does not agree with the commenters that lower compliance costs will favor manufacturers with a large proportion of trucks, noting that in the early years, these manufacturers will need to invest more in technology development, while in later years, compliance costs for trucks are similar to (or even slightly higher than) costs for cars. ACEEE requested that EPA provide these cost estimates for all years for each manufacturer's car and truck fleets. This information was available in chapter 5.1 of the draft RIA, and is also provided in chapter 5.1 of the final RIA.

Referring to the lower initial stringency for trucks, ACEEE expressed concern that that manufactures will use the initially lower truck standards to delay implementation of efficient technologies, and then use this circumstance to argue in the mid-term evaluation for relaxed standards. EPA does not believe this concern in justified. Manufacturers must comply with the standards on their entire fleet; thus a given vehicle is not required to meet any specific GHG standard. Therefore, delaying technologies on any portion of a full-line manufacturer's fleet will hurt their ability to comply across their fleet and thus be non-competitive in other portions of the market. Moreover, while we believe that the stringencies of the program can be met (and are thus feasible), EPA acknowledges that they will be challenging for all manufacturers and that they will all incur significant costs. The likelihood that a manufacturer will slow down the implementation of technology on a certain fraction of their (large sales) fleet just prior to entering the 2022-2025 period where stringencies are increasing at 5% per year, seems extremely unlikely. More likely, if there are cost effective technologies that have not yet been applied, the manufacturer will implement them in advance in order to earn credits for the 5%/yr period (this is the principle of "multi-year planning"). EPA will carefully monitor this issue during the mid-term evaluation.

Others commented more generally that throughout the rulemaking timeframe, the difference between car and truck curves is too large, which places manufacturers which mainly produce passenger cars at a disadvantage (Volkswagen, Toyota, Honda, and Mercedes). These comments are not supported by the analysis conducted for this rule. As just explained there are no indications in EPA's analysis that either the truck or car standards will encourage manufacturers to choose technology paths that lead to significant over or under compliance for cars or trucks, on an industry wide level. A consistent pattern across the industry of manufacturers choosing to under or over comply with a car or trucks standard could indicate that the car or truck standard should be evaluated further to determine if the relative stringency is appropriate in light of the technology choices available to manufacturers, and the costs of those technology choices. As detailed in section III.D.6.b of the preamble, that is not the case for the final car and truck standards, for which we project only a relatively small overall degree of net credit transfers from the truck fleet to the car fleet. EPA's evaluation of the alternative standards led to the same conclusions. EPA thus continues to believe that the relative stringency of the car and truck curves is reasonable and appropriate.

Several commenters maintained that the lower stringency of truck standards would encourage manufacturers to "game" the rule by adding features such as 4WD for the primary purpose of satisfying the requirements for classification as a truck (ICCT, NRDC, UCS). EPA recognizes that significant differences in the year-to-year stringency for cars and trucks could increase the incentives to reclassify cars as light trucks. However, this reclassification comes at significant cost to the manufacture, with added production and component costs, as NRDC acknowledged in their comments, and to the consumer in the form of reduced fuel savings and a higher purchase price (for example, NRDC quoted an additional cost of $1,400 for the 4WD option on the RAV4). EPA thus does not agree with these comments. In any case, EPA believes the car and truck curves appropriately reflect the differences in cost between the car and truck fleets for adding efficiency technologies, as supported by the analysis conducted for this rule.

In comments related to the topic of "gaming", CBD expressed concern that the difference in stringencies would encourage consumers to shift purchases from cars to trucks (as opposed to the comments addressed above that the standards create incentives for manufacturers to "game"). EPA does not believe the relative stringencies will result in a shift of this type, given the increased costs to the consumer mentioned above, and that the vehicle attributes associated with the truck classification may not be desirable to car buyers. Currently, there are many consumers that prefer the 2WD car version over the more costly and less fuel efficient 4WD truck version. EPA believes that manufacturers will continue to offer the variety of vehicles that satisfy the range of attributes that consumers demand, rather than limiting the choices (for example by only offering 4wd truck versions of a model), which could in turn lead to loss of customers and market share. At the same time, as discussed in the introductory text of section III.D of the preamble, EPA acknowledges that manufacturers may decide to alter the utility of the vehicles which they sell, but this would not be a consequence of the rule but rather a matter of automaker business choice. Finally, on the issue of "gaming", EPA plans to review trends in the fleet mix during the mid-term evaluation (see section III.B.3 of the preamble; see also RTC section 15.3 response to POP Diesel).

Honda commented about the relative stringencies of small and large footprint trucks, and proposed that "vehicles other than full-size pickup trucks should receive similar consideration in preserving their utility". EPA notes that the technology penetration analysis conducted for this rule considered the costs of preserving utility for not only full-size pickup trucks, but for vehicles of all footprint sizes. At the same time, EPA believes that pickup trucks are often used in ways that are fundamentally different from the typical use of minivans and smaller SUVs cited by the commenter. For example, Ford, in its comments, provided data for the usage of the F150: "up to 82% of F-150 customers use their vehicles for hauling. Up to 41% haul on at least a monthly basis; and 72% of F-150 customers use their vehicles for towing. Up to 28% tow on at least a monthly basis". The particular type of vehicle usage is significant, since the additional engine power requirements will be greater for vehicles intended to tow and carry heavy loads than for vehicles designed for high volume (but lower density) passenger spaces, such as an 8 passenger minivan.

Honda also commented on the cost per percent CO2 reduction of some of the vehicle technology packages in our proposal. Honda uses the comparison of packages to argue that we have been unfair to smaller footprint trucks relative to larger footprint trucks. However, the packages chosen by Honda were not really appropriate for the specific vehicle models compared by Honda—the packages that Honda thought represent the Honda CR-V and the Ford F150 (among other similar/competing models). Better vehicle types and package choices would have been those shown in the table below since, in our proposal, we placed the CR-V in vehicle type 7 and the higher sales F150s in vehicle types 10 and 14. As shown, the $/% CO2 reduction for the CR-V is far more favorable than the F150 at $41 versus $62-$67, respectively. Similarly, in our final rule where we place the CR-V in vehicle type 7 and the F150 in vehicle types 17 and 18, the $/% CO2 reduction is again far more favorable for the CR-V than the F150 at $39-$43 and $61-$64, respectively. This indicates that on a dollars per percent GHG reduction metric, it is more cost effective to add technology and improve efficiency on the smaller vehicle type 7 (small SUV and Multi-Purpose Vehicle) than the larger vehicle type 17 or 18 (pickup trucks).

	Veh Class	Tech Pkg #	Mass Red	Engine	Trans	Cost	CO2 %	$/%
NPRM	Minivan	707	10%	4V DOHC I4 +EFR2 +LDB +ASL2 +IACC2 +EPS +Aero2 +LRRT2 +HEG +DCP +GDI +TDS18	8sp DCT-dry	$1,794	43%	$41.40
NPRM	Minivan	1013	15%	4V DOHC V6 +EFR2 +LDB +ASL2 +IACC2 +EPS +Aero2 +LRRT2 +HEG +DCP +GDI +SAX +TDS18	8sp AT	$2,953	44%	$67.52
NPRM	Large truck	1411	10%	4V DOHC V6 +EFR2 +LDB +ASL2 +IACC2 +EHPS +Aero2 +LRRT2 +HEG +DCP +GDI +SAX +TDS18	8sp AT	$2,587	42%	$62.16
FRM	Small MPV	7.03904	10%	MPVnt 4VDI4 +LUB +EFR1 +ASL2 +IACC2 +EPS +Aero2 +LDB +LRRT1 +DCP +GDI +TDS18 +WR10% +6sp	6sp DCT-dry	$1,366	35%	$39.18
FRM	Small MPV	7.05313	10%	MPVnt 4VDI4 +EFR2 +ASL2 +IACC1 +EPS +Aero1 +LDB +LRRT2 +HEG +DCP +GDI +SAX +TDS18 +WR10% +8sp	8sp DCT-dry	$1,696	39%	$43.45
FRM	Small MPV	7.05202	10%	MPVnt 4VDI4 +LUB +EFR1 +ASL2 +IACC2 +EPS +Aero2 +LDB +LRRT2 +HEG +DCP +GDI +TDS18 +WR10% +8sp	8sp DCT-dry	$1,747	41%	$43.12
FRM	Truck	17.05319	10%	PU 4VDV6 +EFR2 +ASL2 +TORQ +IACC2 +EHPS +Aero2 +LDB +LRRT2 +HEG +DCP +GDI +SAX +TDS18 +WR10% +8sp	8sp AT	$2,654	42%	$63.78
FRM	Truck	17.04006	10%	PU 4VDV6 +LUB +EFR1 +ASL2 +TORQ +IACC1 +EHPS +Aero1 +LDB +LRRT1 +DCP +GDI +SAX +TDS18 +WR10% +6sp	6sp AT	$2,020	32%	$62.94
FRM	Truck	18.05319	10%	PU 4VDV6 +EFR2 +ASL2 +TORQ +IACC2 +EHPS +Aero2 +LDB +LRRT2 +HEG +DCP +GDI +SAX +TDS18 +WR10% +8sp	8sp AT	$2,615	42%	$62.84
FRM	Truck	18.04006	10%	PU 4VDV6 +LUB +EFR1 +ASL2 +TORQ +IACC1 +EHPS +Aero1 +LDB +LRRT1 +DCP +GDI +SAX +TDS18 +WR10% +6sp	6sp AT	$1,982	32%	$61.73
FRM	Truck	18.05310	10%	PU 4VDV6 +LUB +EFR1 +ASL2 +TORQ +IACC2 +EHPS +Aero2 +LDB +LRRT2 +HEG +DCP +GDI +SAX +TDS18 +WR10% +8sp	8sp AT	$2,519	41%	$61.35

ICCT commented that with the exception of pickup trucks, full size cargo vans, and a few SUVs, the construction of cars and trucks are similar, and there is therefore no technical reason to separate car and truck curves. EPA notes that ICCTs list of "exceptions" make up the majority of the truck market. However, we acknowledge that there are a number of vehicle nameplates that are classified as both car and truck and that their primary attribute difference is the 2WD vs the 4WD option (there are other attribute differences such as ground clearance, approach angles, etc.). As noted above, the 4WD attribute has a significant impact on fuel efficiency, cost, and consequently consumer choice. Ford provided an example of how towing requirements can result in differences in fuel efficiency and cost, commenting, "the Ford Edge and the Ford Taurus have the same footprint, but vastly different capabilities with respect to cargo space and towing capacity. Some of the key features incorporated on the Edge that enables the larger tow capability include an engine oil cooler, larger radiator and updated cooling fans."

The cost and efficiency differences that arise from differences in the utility of cars and trucks are real and measureable. Thus, at this time, EPA believes that the classification of these vehicles on two separate curves is justifiable and reasonable.

2.2.3. Backstop Standards

Organizations Included in this Section

Alliance of Automobile Manufacturers
Center for Biological Diversity
Mercedes-Benz USA, LLC
Natural Resources Defense Council (NRDC)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Toyota Motor North America
Union of Concerned Scientists (UCS)
Whitefoot, K. and Skerlos, S.

Organization: Alliance of Automobile Manufacturers

Backstop Standards [EPA-HQ-OAR-2010-0799-9487-A1, p.87]

The NPRM requests comments on whether minimum CAFE levels (so called “backstop standards”) should be adopted for import passenger car and light duty truck fleets. The need for backstop standards had been assessed during the MY 2012-16 GHG and fuel economy standards regulatory process. The agencies noted that substantial comments had been provided on both sides of the issue, but in the end determined that backstop standards would not be necessary. That decision was primarily based on the confidence the agencies had in their fleet modeling and the lack of incentives for manufacturers to “game” their product line-up in such a way to undermine the anticipated gains of the program. [EPA-HQ-OAR-2010-0799-9487-A1, p.87]

Concerns about backstop standards that were raised by the Alliance in the context of the MY 2012-2016 rules remain in place today. The concept of backstop standards is inconsistent with Reformed CAFE, which is intended to allow manufacturers to build the full range of vehicles that consumers demand. Backstop standards are unlikely to come into play in the first place, but if they did, they could have the effect of unduly limiting consumer choice and hampering the industry’s ability to achieve the goals of continuing the national program as cost-effectively as possible. Further, we continue to believe that NHTSA does not have legislative authority to adopt backstop standards for the import passenger car and light duty truck fleets. [EPA-HQ-OAR-2010-0799-9487-A1, p.87]

Notwithstanding NHTSA's previous decision to forego backstop standards, the question whether backstop standards should be reassessed in the context of the MY 2017-2025 rulemaking is raised on the basis that NHTSA “recognize[s] that given the time frame of the current rulemaking, the agency cannot be as certain about the unlikelihood of future market changes.” [EPA-HQ-OAR-2010-0799-9487-A1, p.87]

The Alliance concurs that there is increasing uncertainty with respect to market conditions, technological advances, consumer demand, etc., as we look further and further into the future. It is this uncertainty that gave rise to the mid-term evaluation provisions, which we believe are an essential element of the MY 2017-2025 National Program rules. Any necessary adjustments to the standards based on market shifts or other unforeseen developments should be addressed pursuant to the mid-term evaluation process (for EPA) and the concurrent process of setting final, enforceable CAFE standards (for NHTSA). Apart from that, it is not helpful or desirable to layer additional requirements on top of the Reformed CAFE standards, since this would only serve to reduce flexibility and add complexity to the manufacturers' product planning efforts. We therefore oppose any consideration of additional backstop standards at this time and recommend that the agencies rely on the mid-term evaluation and the CAFE standard-setting process as their primary means for making any necessary adjustments to the stringency and structure of the program. [EPA-HQ-OAR-2010-0799-9487-A1, pp.87-88]

Organization: Center for Biological Diversity

D. NHTSA Should Adopt a Backstop to Ensure the Nationwide Fleet Moves Towards Greater Fuel Efficiency.

As noted above, the rulemaking is currently structured so that the fuel economy standard actually reached in each MY depends entirely on each manufacturer’s fleet mix during that year. If manufacturers shift towards a greater percentage of light trucks, or increase the size of their vehicles to trigger less stringent fuel economy standards, the overall fuel efficiency of the nationwide fleet will decrease. But Congress tasked NHTSA with prescribing ratable fuel economy standards for passenger automobiles and light trucks, not with merely estimating them. Attribute-based standards “plus a backstop would prevent manufacturers from upsizing their vehicles or producing too many large vehicle footprint vehicles, if the backstop were set high enough.”83 We believe that, without a backstop, the NPRM does not comply with the statutory mandate to prescribe ratable increases, particularly given the free pass for the largest trucks and the added incentive to shift toward the least efficient vehicles. The Center proposes that the Agencies adopt a backstop to rein in shifts towards manufacturing larger vehicles and to ensure the standards continue to move the nationwide fleet towards energy conservation. [EPA-HQ-OAR-2010-0799-9479-A1, p. 17]

NHTSA has resisted adopting a backstop for years, despite losing the argument in Center for Biological Diversity v. NHTSA. In that case, the court observed, “Petitioners raise well-founded concerns (given the historical trend) that a floating feet mix-based standard would continue to permit upsizing – which is not just a function of consumer demand, but also a function of manufacturer’s own design and marketing decisions.” 84 The court found that NHTSA had not considered fuel conservation in deciding not to adopt a backstop, and had not shown that a backstop would be either technologically infeasible or economically impractical. It remanded the rulemaking with instructions for NHTSA to “reconsider under the proper standard whether to adopt a backstop based on the factors in the statute.”85 [EPA-HQ-OAR-2010-0799-9479-A1, p 17]

In subsequent rulemakings, NHTSA justified its continuing refusal to set a backstop based on various reasons, including its belief that it could successfully prognosticate fleet mix shifts, that its footprint attribute-based standard would prevent gamesmanship and backsliding, that the lack of lead time and a growing preference for smaller cars weighed against adopting a backstop, and that backstops created inequitable burdens on manufacturers who exceeded the backstop.86 However, the Agencies did recognize the potential need for a backstop in the current NPRM: "[W]e recognize that given the time frame of the current rulemaking, the agency cannot be as certain about the unlikelihood of future market changes. Depending on the price of fuel and consumer preferences, the 'kind of industry-wide situation' described in the MYs 2012– 2016 rule is possible in the 2017–2025 time frame, particularly in the later years."87 [EPA-HQ-OAR-2010-0799-9479-A1, pp 17-18]

The Agencies are correct. They cannot possibly predict future market changes or "consumer preference" with any degree of certainty over a period spanning some 14 years. Moreover, the justifications NHTSA provided in the MY 2011 and MY 2012-2016 final rules for failing to adopt backstops are incorrect or no longer apply, and do not in any event consider the relevant statutory factors as required by CBD v. NHTSA. [EPA-HQ-OAR-2010-0799-9479-A1, p 18]

First, the hypothesis that the attribute-based system does not provide an incentive to increase the size of vehicles has been refuted by studies showing the opposite. In fact, considering multiple variables, including consumer preferences, a recent study of the MY 2012- 2016 final rulemaking concluded that under most scenarios, the attribute-based standards "create an incentive to increase vehicle size that undermines gains in fuel economy."88 In all but two simulations, "the sales-weighted average vehicle size increases by 2–32%, undermining gains in fuel economy by 1–4 mpg (0.6–1.7km/L). Carbon-dioxide emissions from these vehicles are 5–15% higher as a result . . . which is equivalent to adding 3–10 coal-fired power plants to the electricity grid each year. Furthermore, results suggest that the incentive is larger for light trucks than for passenger cars, which could increase traffic safety risks."89 Moreover, the same study found that the incentive to increase vehicle size is greater for light trucks than for passenger cars due to the larger impact of the CAFE standards for light trucks on manufacturers' profits: "Because the light truck standard causes larger profit losses than the passenger car standard, firms increase the sales-weighted average footprint of light trucks more than passenger cars." 90 Thus, the Agencies' claim that the attribute-based standards serve as backstops and prevent backsliding is simply incorrect. The already existing incentives to upsize would now be substantially increased. Without a backstop, it is not credible to assume that the fleet will not shift to lower efficiency vehicles. [EPA-HQ-OAR-2010-0799-9479-A1, p 18]

Second, the claim of insufficient lead time to adjust to backstops is inapplicable to the MY 2017-2025 NPRM. Manufacturers will have unprecedented lead time to adjust their future fleets to the new regulations. The amount of lead time also refutes the argument that the backstop will create an inequitable burden on manufacturers currently above it: this problem can be remedied in the intervening years. [EPA-HQ-OAR-2010-0799-9479-A1, p 18]

Lastly, the Agencies have not based their refusal to implement a backstop on any analysis of the statutory factors they must consider: technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need for the

United States to conserve energy.91 We believe that none of the first three factors could be cited as a reason for foregoing a backstop, while the latter convincingly demands one. In short, the Agencies must supply annual or at least periodic backstops to comply with statutory mandates and dissuade manufacturers from “gaming” the attribute-based curves and avoiding implementation of fuel saving technology. [EPA-HQ-OAR-2010-0799-9479-A1, pp 18-19]

We also note that the NPRM allows manufacturers to rely on a variety of flexibilities and credits, discussed below, to meet annual fuel economy standards. The Agencies prognosticate that these features will decrease actually achieved mileage by less than 3 mpg by 2025 (see further discussion of credits below); but given the long time span covered by the rulemaking, this prediction is, by necessity, highly uncertain. A backstop would also ensure that the various credits and flexibilities will not be abused to the detriment of fuel conservation. [EPA-HQ-OAR-2010-0799-9479-A1, p 19]

We agree with the Agencies’ approach to extend exemptions only to small businesses as defined by the Small Business Administration and to limit the small volume manufacturers’ exemption to business with U.S. annual sales of less than 5,000 vehicles. Given the long lead times of the current rulemaking, no further exemptions are warranted. [EPA-HQ-OAR-2010-0799-9479-A1, p 19]

Congress has effectively set a backstop of 35 mpg in 2020 for the overall fleet. The Agencies’ estimated fuel economy standards, however, demonstrate that the fleet can more than meet this standard; it can exceed it before 2020 even under the preferred alternative. In setting the maximum feasible standards, the Agencies should prescribe annual or at least periodic backstops designed to move the fleet to higher standards based on maximum feasible levels. [EPA-HQ-OAR-2010-0799-9479-A1, p 19]

83 See CBD v. NHTSA, 538 F.3d at 1204.

84 CBD v. NHTSA, 538 F.3d at 1206.

85 Id.

86 See, Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011, 74 Fed. Reg. 14,196, 14,412 (March 30, 2009); see also Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule 75 Fed. Reg. 25,324 25,368-70 (May 7, 2010).

87 NPRM, 76 Fed. Reg. at 75,228.

88 See Whitefoot at 41 ENERGY POLICY 402, 410 (2012).

89 Id. at 402.

90 See id. at 409.

91 See CBD v, NHTSA, 538 F.3d at 1205.

Organization: Mercedes-Benz USA, LLC

Minimum 'Backstop' Standards for Imported Passenger Cars and Light Trucks

NHTSA once again raises the possibility of minimum 'backstop' CAFE standards for the imported passenger car and light truck compliance categories. Such 'backstop' standards, however, are both contrary to NHTSA's statutory authority and inconsistent with the Congressional mandate to regulate fuel economy through an attribute based program. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-18]

When amending the EPCA in 2007, Congress both mandated the use of an attribute-based program for the CAFE program and created a backstop for the domestic passenger car fleet. NHTSA construes the fact that Congress did not include the other compliance categories as legislative 'silence.' However, the fact that Congress included only the domestic passenger car fleet is determinative evidence that Congress intended not to allow a backstop to be applied to the imported passenger car fleet or the light truck fleet. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-18]

This is especially true where, as here, the imposition of a backstop is inherently inconsistent with attributes standards. The attribute based system was established as a replacement for a corporate average system with one numeric requirement. The proposed standards are aggressive and will require extensive technology adoption and market advancements for manufacturers to meet them. Manufacturers have no incentive to 'backslide.' The development of a trading market, moreover, creates a yet further incentive to continue to advance, especially in light of the overall stringency of the standards, because doing so creates a valuable and marketable asset. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-18]

There is no reason for the agencies to consider a backstop in the context of an aggressive and carefully constructed attribute based program. Congress continued the concept of a minimum standard for the domestic passenger car compliance category and made it clear through omission that such a backstop standard was not intended to be applied to the other compliance categories. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-18]

Organization: Natural Resources Defense Council (NRDC)

EPA and NHTSA should establish manufacturer-specific 'backstop' standards to ensure that environmental objectives are not undermined by shifts in sales mix and average vehicle size. [EPA-HQ-OAR-2010-0799-9472-A2, p. 4]

E. Compliance and Enforcement Requirements

1. GHG Standards Need 'Backstop' Standards to Ensure Environmental Objectives Are Not Undermined by Shifts in Sales Mix

The proposed GHG and fuel economy standards lack a regulatory 'backstop' mechanism to ensure that the 2025 fleetwide average emission level reaches 163 g/mi and that the targeted cumulative greenhouse gas and oil consumption reductions are met. Such mechanisms are necessary because under an attribute-based system that has separate car and light truck standards, the fleet sales mix could shift to larger, higher-emitting vehicles and to a greater proportion of light trucks, resulting in greater fleetwide emissions and oil consumption. [EPA-HQ-OAR-2010-0799-9472-A2, p. 17]

Achieving the pollution and oil reduction goals of the program are dependent on the overall market achieving the agencies' forecasted sales and size mixes. To reach a fleetwide average of 163 g/mi and 49.6 mpg in MY 2025, the agencies have set the individual car and light truck standards on the assumption of a specific car/light truck sales split. However, if the automakers shift their product mix to more light trucks or if they change the vehicle designs to classify fewer models as cars and more models as light trucks, this car/light truck split would be changed and the GHG and oil savings goals of the program would be undermined. [EPA-HQ-OAR-2010-0799-9472-A2, p. 17]

To prevent intentional and unintentional market shifts from undermining the environmental and oil savings benefits of the National Program, we recommend EPA and NHTSA adopt manufacturer-specific backstops on the combined car and light truck standards that bar an individual automaker from exceeding its forecast GHG emission levels by more than 2 gCO_2-equivalent/mi and forecast fuel economy levels by approximately 0.5 mpg. Manufacturer-specific backstop standards would ensure that specific manufacturers can be held accountable if the overall fleet emission targets are missed. A manufacturer should be allowed no more than three years to make up any exceedance in its manufacturer-specific backstop standard. [EPA-HQ-OAR-2010-0799-9472-A2, p. 17]

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

As we did in our comments on the 2012-2016 standards, we urge both agencies to consider including what we consider necessary "backstops" to the program. The draft rule fails to include measures sufficient to ensure that the fleet-wide targets in the rule are met. The draft rule relies upon attribute-based curves, whose efficacy will vary with the composition in the fleet. As currently written the draft rule would allow shifts in fleet composition to undermine greenhouse gas and oil reduction targets. A "backstop," in the form of a hard fleet-wide limit under-girding the attribute curves, should be incorporated in the final rule to insure that the program meets President Obama's stated goals. [EPA-HQ-OAR-2010-0799-9549-A2, p. 5]

Both NHTSA and EPA are granted broad authority and stern directives to incorporate backstop regulatory structures into fuel efficiency rules. For example, NHTSA is required to promulgate fuel efficiency regulations in terms of absolute standards, as opposed to mere targets that may or may not be by the regulatory program.15 Similarly, EPA is directed under the Clean Air Act to take measures to that pollution from vehicles is actually prevented.16 Rules promulgated under EPA authority, accordingly, should not be undermined by increasing vehicle footprint to dilute the overall intent and benefit of the standards. [EPA-HQ-OAR-2010-0799-9549-A2, p. 5] [EPA-HQ-OAR-2010-0799-9549-A2, p. 5]

Here, achievement of the target fuel economies and greenhouse gas reductions depend on the mix of vehicle classes on the road in the U.S. years in the future. The law governing both NHTSA and EPA requires that the uncertainty in those targets be resolved into enforceable standards through employment of a backstop. The draft rule should be revised to include such a backstop before it becomes final. Backstop mechanisms should be considered during the midterm review. [EPA-HQ-OAR-2010-0799-9549-A2, pp. 5-6]

---

15 See 42 U.S.C. § 32902(a) (standards “shall be the maximum feasible average fuel economy level”) (emphasis added); id. at § 32901(a)(6) (defining “average fuel economy standard” as the “performance standard specifying a minimum level of average fuel economy applicable to a manufacturer”) (emphasis added); see also Center for Biological Diversity v. National Highway Traffic Safety Admin., 538 F.3d 1172, 1204-06 (9th Cir. 2008) (concluding that NHTSA acted arbitrarily and capriciously in dismissing inclusion of a backstop in issuing reformed CAFE standards). [EPA-HQ-OAR-2010-0799-9549-A2, p. 5]

16 42 U.S.C. § 7521(a)(1) (EPA shall propose “standards applicable to the emission of any air pollutant” from vehicles that “cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare”); 42 U.S.C. § 7401(c) (“primary goal” of the Clean Air Act is “pollution prevention”). [EPA-HQ-OAR-2010-0799-9549-A2, p. 5]

Organization: Toyota Motor North America

Potential Expansion of Domestic Passenger Car Anti-Backsliding Standards [EPA-HQ-OAR-2010-0799-9586-A1, p.6]

Toyota opposes any expansion of anti-backsliding provisions beyond the domestic passenger car fleet in the CAFE program. The clear intent of Congress has been that NHTSA should only establish anti-backsliding standards for the domestic car fleet. As such, EPCA (as modified by EISA) requires NHTSA to establish anti-backsliding standards for domestic passenger cars and does not authorize NHTSA to establish additional anti-backsliding standards for import cars and trucks. [EPA-HQ-OAR-2010-0799-9586-A1, p.6]

In the case of EPA and the CAA, there is no explicit statutory authority that either compels or authorizes EPA to establish anti-backsliding standards for any class of light duty vehicles. While EPA's authority may be ambiguous, it is clear that any EPA-issued anti-backsliding standards would create new inconsistencies between the NHTSA and EPA programs, rather than support the goal of harmonization. NHTSA's anti backsliding standards are limited to domestic passenger cars, and the CAA cannot be used to duplicate a similar outcome since EPA's fleet definitions do not distinguish between domestic cars and import cars. The most 'harmonized' outcome is for NHTSA to proceed with the required domestic car anti-backsliding standard for the CAFE program, and for EPA to forego any attempt to set anti-backsliding standards under the CAA. [EPA-HQ-OAR-2010-0799-9586-A1, p.6]

Notwithstanding the legal constraints described above, Toyota outlined in its November 25, 2009 comments in response to the 2012-2016 model year rulemaking a variety of additional factors describing why anti-backsliding standards are unnecessary. Please refer to those comments. [EPA-HQ-OAR-2010-0799-9586-A1, p.6]

Organization: Union of Concerned Scientists (UCS)

Finally, the attribute-based system employed in the proposed rule does not guarantee that automakers will actually achieve the 163 g/mi and 49.6 mpg standard in MY2025. The agencies base these fleetwide projections on a variety of assumptions, including the vehicle footprint of future vehicles and the relative sales mix between cars and light-trucks. If these assumptions are wrong or if automakers adopt compliance strategies that either reclassify passenger cars as light trucks or add size to vehicle footprints in order to qualify for weaker standards, the projected benefits of the standards could be sizably eroded, particularly in the first five model years of the program, which have the largest gap in car/truck stringency. [EPA-HQ-OAR-2010-0799-9567-A2, p. 7]

In order to ensure that model year 2017-2025 vehicles yield anticipated consumer savings, oil savings and greenhouse gas reductions, the standards must include a backstop mechanism. Under the current attribute-based system, no mechanism exists to adjust individual manufacturers' fleet requirements in the event that product plans or manufacturer-specific performance diverges from anticipated levels. Because of these risks and because the model year 2017-2025 standards will be finalized before compliance data can be gathered under the new attribute-based system, it is critical to include a backstop mechanism to ensure that the fleet maintains its projected fuel economy and greenhouse gas emissions trajectory. A backstop could take numerous forms; UCS suggests one that includes an automatic re-computation or "ratchet" of stringencies for subsequent years, such that the National Program's cumulative emissions reductions and oil savings goals are fully achieved in 2025, even if falling short in early years of the program. [EPA-HQ-OAR-2010-0799-9567-A2, p. 7]

Finally, in addition to the gap between the car and truck standards, the relative stringency of the truck standards decreases as vehicle size increases. For the largest pickup trucks, total reductions in emissions required between 2016 and 2021 amount to less than 5% versus nearly 18% for the smallest trucks. Automakers may find it more economical to add footprint size to qualify for less stringent standards rather than add emission control technologies, further eroding benefits.

To prevent a loss in benefits, the agencies should adopt a backstop mechanism to ensure the anticipated global warming pollution reductions and oil savings benefits are achieved. [EPA-HQ-OAR-2010-0799-9567-A2, p. 8]

Organization: Whitefoot, K. and Skerlos, S.

Additional minimum fuel economy standards are warranted due to the substantial risks of backsliding. We encourage NHTSA to establish minimum standards across the combined fleet of passenger cars and light trucks to provide a limit to backsliding. [EPA-HQ-OAR-2010-0799-9447-A1, p. 1]

Below, we respond to NHTSA's request for comments on additional minimum standards and how they should be structured.

As NHTSA indicates in the proposed rule, the Energy Policy and Conservation Act of 1975 (EPCA), as amended by the Energy Independence and Security Act (EISA) of 2007 explicitly requires NHTSA to establish a minimum standard for domestic passenger cars but is silent as to whether the agency should or could establish other minimum standards. We believe that the requirement in EPCA (as amended by EISA) that the standards "achieve a combined fuel economy average for model year 2020 of at least 35 miles per gallon for the total fleet of passenger and non-passenger automobiles manufactured for sale in the United States" effectively requires NHTSA to establish additional backstops. This is because attribute-based standards (which are required by EPCA as amended by EISA) do not guarantee that any specific combined fuel economy average for the total fleet will be met in any year since the attributes of the fleet can change. 1 Therefore, additional minimum standards are needed to meet the requirement of reaching 35 miles per gallon by 2020. [EPA-HQ-OAR-2010-0799-9447-A1, p. 3]

The minimum standards for light trucks and imported passenger cars presented in the proposed rule for comment would help to limit the risk of backsliding and are warranted. However, these minimum standards do not reduce incentives to increase the production of light trucks relative to passenger cars, which would lead to higher fuel consumption and GHG emissions. We recommend that NHTSA establish a minimum standard across the combined fleet of passenger cars and light trucks for each year to limit incentives to increase production of light trucks in response to the regulation. Furthermore, we encourage NHTSA to establish minimum standards for light trucks at a high-enough level to ensure that fuel economy improvements in the total fleet are close to projected levels even if the production of light trucks increases. [EPA-HQ-OAR-2010-0799-9447-A1, p. 3]

Further backstops in the standards are warranted due to the substantial risks of backsliding during MYs 2017-2025. NHTSA has proposed minimum standards for domestically manufactured passenger cars in the proposed rule. We believe this is not enough to ensure that actual fuel economy improvements are close to the expected levels that NHTSA projects. [EPA-HQ-OAR-2010-0799-9447-A1, p. 3]

Response:

One undeniable feature of the footprint-based GHG emissions (and fuel economy) standard is that the fleet-wide GHG emissions reductions actually realized will depend on the average and distribution of vehicle footprint levels in future model years, and those footprint levels will not be known with certainty until months after the end of each model year. EPA projections of the average vehicle GHG emissions compliance level and societal GHG emissions savings in the future, for example, might prove to be either high or low depending on whether the average and distribution of vehicle footprint levels change relative to current projections. In response to the inherent uncertainty associated with footprint-based standards, one regulatory concept that has emerged is the concept of an emissions "backstop" that would move GHG emissions target values lower if vehicle footprint levels increase in the future. See 75 FR 25368-25370.

The agencies received comments both in support of and in opposition to the concept of a GHG emissions backstop.

The Center for Biological Diversity (CBD), Natural Resources Defense Council (NRDC), Sierra Club et al, Union of Concerned Scientists (UCS), and the researchers Whitefoot and Skerlos all supported the concept of a GHG emissions (and/or fuel economy) backstop. These commenters expressed concerns about vehicle footprint levels increasing ("upsizing") over time, as well as a future increasing truck market share. NRDC made a specific proposal for a manufacturer-specific backstop that would limit an individual manufacturer's combined car and truck CO_2 emissions level to no more than a 2 g/mi increase over that projected by EPA in this rulemaking. UCS supported an industry-wide "rachet" backstop approach that would build into the final regulations a provision for automatically making future years' CO_2-footprint curves more stringent if the data from early years shows higher footprint levels and higher average GHG emissions performance than projected by EPA. Other supporters strongly supported the concept of a GHG emissions backstop, but did not endorse specific designs. Whitefoot and Skerlos have published an academic study, using certain assumptions about key parameters, that projects that the MY 2014 footprint-based standards were likely to promote "upsizing" and therefore yield lower GHG emissions and oil savings than projected by EPA and NHTSA.

The Alliance of Automobile Manufacturers (AAM), Mercedes-Benz, and Toyota opposed GHG emissions (and/or fuel economy) backstops. AAM and Mercedes-Benz both stated that the concept of a backstop is inconsistent with an attribute-based standard, which by definition is intended to be flexible with respect to consumer demand, and AAM suggested that any necessary adjustments based on unforeseen developments should be addressed in the mid-term evaluation.

EPA is rejecting GHG emissions backstops in this final rule. Explicit and implicit in many of the comments is that there is an inherent tension between a footprint-based standard and certainty of GHG emissions reductions, and the agency recognizes this tension as well. The agency recognizes that factors related to specific design features of the final rule (shape of car and truck curves, relative stringency between car and truck curves) as well as factors unrelated to specific design features of this final rule (fuel prices, consumer preferences) could affect the average and distribution of vehicle footprint levels and therefore average GHG emissions requirements. Of course, footprint levels could increase or decrease relative to current projections, and GHG emissions reductions could therefore be either lower or higher than projected.

With respect to the design of the CO_2-footprint curves, EPA believes we have developed curves that maintain a reasonable level of neutrality with respect to technological feasibility across different vehicle classes and footprint levels. As discussed in Preamble Section III.D.6.b, EPA projects a relatively small overall net credit transfer from the truck fleet to the car fleet, which suggests that the relative stringency between the car and truck curves is relatively neutral. Accordingly, the agency believes that our projections of future footprint levels are reasonable, and that any future changes in average footprint or the distribution of footprint levels due to the design of the CO_2-footprint curves are not likely to lead to more than modest changes to projected GHG emissions reductions. See RTC Section 2.2.2 and joint TSD section 2,4 for a longer response to the Whitefoot and Skerlos study.

The agency believes it is more likely that changes unrelated to the design of this rule, such as fuel prices or consumer preferences, will affect future vehicle footprint levels and GHG emissions requirements. In this regard, we note that AEO2012 Early Release projects relatively stable gasoline prices over the next 13 years. The average actual price in the U.S. for the first four months of 2012 for regular gasoline was $3.68 per gallon[3] with prices approaching $4.00 in March and April.[4] The AEO2012 Early Release reference case projects the regular gasoline price to be $3.87 per gallon in 2025, only slightly higher than the price for the first four months of 2012.[5] As explained in preamble section III.D. 1.a, this factor strongly supports using a flat baseline (no significant voluntary GHG emissions improvement over the MY 2016 standard absent further regulation). However, for the same reason, this projection militates against the need for a backstop in this rule since no significant shift in fleet mix would be expected under these circumstances. Of course if oil prices were to drop to the levels of the 1990s, it is almost certain that vehicle footprint levels would rise and GHG emissions requirements would increase as well, while if oil prices were to increase significantly above today's level (and the level projected for MY 2025 based on AEO 2012 Early Release), it is quite likely that vehicle footprint and GHG emissions requirements would both decrease. (although no such decreases or increases are projected by AEO)

There are other drawbacks to adopting backstops (including backstops with ratchets, as UCS advocates). As explained in detail in the MYs 2012-2016 rule preamble, stringent backstops can compromise some of the advantages of attribute-based standards, especially with respect to manufacturers above a backstop, and especially under conditions where the entire industry's performance, taken as a whole, remains consistent with the emissions levels projected for the standards. See 75 FR at 25369; see also EPA Response to Comment Document for MY 2012-2016 rule at pp. 3-99 to 3-102. Under these circumstances, manufacturers would again (as under the flat CAFE regime) have the incentive to downsize as a compliance strategy, undermining the safety and across-all-footprint improvement objectives of an attribute-based standard. These concerns remain here. . EPA notes further that the questions about the potential need for a backstop, and if so, the best design of such a backstop, are very complex and difficult

[3] In 2012 dollars. As 2012 is not yet complete, we are not relating this value to 2010 dollars. See RIA 1 for additional details on the conversion between dollar years.
[4] http://www.eia.gov/petroleum/gasdiesel/ and click on "full history" for weekly regular gasoline prices through May 7, 2012, last accessed on May 8, 2012.
[5] http://www.eia.gov/forecasts/aeo/er/ last accessed on May 8, 2012.

to assess as we are at the beginning stages of a 14-year program of more stringent GHG emissions standards

For all of these reasons, both related and unrelated to the CO_2-footprint curves in this final rule, EPA believes it unnecessary to establish a backstop in this rule. EPA commits to monitoring vehicle footprint data, and that data will form the basis for an analysis of the potential need for a GHG emissions backstop (or different GHG standards) in the mid-term evaluation.

2.3. Additional Flexibility for Intermediate Volume Manufacturers

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Suzuki Motor Corporation
Fisker Automotive, Inc.
Jaguar Land Rover North America, LLC (JLRNA)
Natural Resources Defense Council (NRDC)
Porsche Cars North America, Inc. (PCNA)
Volkswagen

Organization: Alliance of Automobile Manufacturers

The program flexibilities in the Notice of Proposed Rulemaking (NPRM) will help manufacturers introduce new technologies that produce concrete environmental and fuel consumption benefits. The Alliance supports the flexibilities in the proposal and understands the needs of lower volume, limited line manufacturers. The program flexibilities in the NPRM will encourage early investment in technologies that produce concrete environmental and fuel consumption benefits that will be necessary to meet these challenging and increasingly stringent standards over the longer term. [EPA-HQ-OAR-2010-0799-9487-A1, p.4]

Organization: American Suzuki Motor Corporation

Suzuki is concerned, however, that the proposed standards do not adequately recognize the lead time needs of low-volume, limited-line manufacturers like Suzuki. [EPA-HQ-OAR-2010-0799-9523-A1, p.1]

California has long recognized that companies with small sales volumes and a limited number of models face unique challenges in complying with stringent standards that rely on the implementation of advanced technologies. As a result, California has created different manufacturer size categories[1], and has used these categories to provide additional implementation lead time for smaller-volume manufacturers. This approach helps to address, to some extent, the disadvantages that small-volume manufacturers have, compared to larger-volume manufacturers, in introducing advanced technologies across their product lines. Suzuki requests that the Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA) adopt a similar approach in regulating GHG emissions and corporate average fuel economy. [EPA-HQ-OAR-2010-0799-9523-A1, p.1]

Suzuki Proposal

Suzuki proposes that EPA and NHTSA (1) establish a Limited Line Manufacturer (LLM) size category that approximates the California Small Volume Manufacturer (SVM) category scaled up to a national level, and (2) establish a three-year implementation lead time allowance for LLMs. [EPA-HQ-OAR-2010-0799-9523-A1, p.1]

Suzuki suggests that a national average annual sales volume such as 50,000 vehicles (calculated as a three-year average) would roughly approximate, on a national level, the threshold to qualify as an SVM in California. Suzuki proposes that LLMs be given a three-year implementation lead time allowance which does not require LLMs to comply with the 2017 model year standards until the 2020 model year, and requires LLMs to comply with the 2018-2025 model year standards in model years 2021-2028. Under this proposal, LLMs would meet the same GHG/fuel economy standards as large manufacturers, but with a moving three-year lead time allowance. [EPA-HQ-OAR-2010-0799-9523-A1, p.1]

Reason for Suzuki's Proposal

When small-volume manufacturers need to develop new technology and develop a new model/new engine to make the significant improvements necessary to comply with the proposed standards, the per-vehicle cost for the special development that is needed specifically for the U.S. market is much higher than for manufacturers with larger sales volumes. [EPA-HQ-OAR-2010-0799-9523-A1, p.2]

Adoption of Suzuki's proposal would have an insignificant impact on nationwide GHG emissions, as the combined GHG emissions from vehicles produced by small-volume manufacturers are an extremely small percentage of the fleet-wide total. [EPA-HQ-OAR-2010-0799-9523-A1, p.2]

Organization: Fisker Automotive, Inc.

Likewise, manufacturers seeking to participate in the expanded Temporary Lead-Time Allowance Alternative Standards (TLAAS) “must secure credits to the extent they are reasonably available from other manufacturers to offset the difference between their emissions reductions obligations under the base TLAAs program and the expanded TLAAS program.” Fisker Automotive strongly encourages EPA to hold to the spirit of these provisions. As the only entity with complete knowledge of every automaker’s credits and deficits, it is incumbent upon EPA to ensure that this provision is fairly enforced. [EPA-HQ-OAR-2010-0799-9266-A1, p. 4]

Organization: Jaguar Land Rover North America, LLC (JLRNA)

Jaguar Land Rover will meet the 2012-2016MY GHG program by a number of significant product actions and through use of the Expanded TLAAS program. [EPA-HQ-OAR-2010-0799-8102-A1, p. 1]

The Unique Challenge Facing Jaguar Land Rover in the Transition to the 2017MY Standard

Even though our company will make substantial CO_2 reductions during the 2012-2016MY period, the proposed 2017MY standard poses very significant challenges. First, as the Expanded TLAAS program comes to a close in 2016MY, companies which participated in this program will start 2017MY with either no CO_2 credits banked or CO_2 debits carrying forward. We understand the rationale in this structure but the resulting transition does not allow lower volume, limited line manufacturers the same flexibilities as afforded large volume manufacturers. [EPA-HQ-OAR-2010-0799-8102-A1, p. 1]

Given this situation, JLR requests that EPA consider a range of flexibilities aimed at creating a fair standard for lower volume, limited line manufacturers. Included amongst these ideas is a proposal to phase in the base standard for lower volume, limited line manufacturers toward full compliance in 2022MY. [EPA-HQ-OAR-2010-0799-8102-A1, p. 1]

As a result of this dramatic impact, JLR is inviting the EPA to consider phasing-in the GHG program for lower volume, limited line manufacturers, starting in 2017MY and ending with 2021MY production. We propose that manufacturers in this program be required to come into full compliance with the base program from 2022MY. [EPA-HQ-OAR-2010-0799-8102-A1, p. 2]

In the NPRM, EPA requested comments on additional lead-time for lower volume, limited line manufacturers. In response to this invitation, Jaguar Land Rover requests that EPA consider phasing in the 2017MY+ program for lower volume, limited line niche manufacturers when the Expanded TLAAS ends. This proposed alternative GHG standard would be designed to ensure fair but very stringent CO_2 reductions in excess of the industry average. [EPA-HQ-OAR-2010-0799-8102-A1, p. 2]

JLR will be delivering very significant CO_2 reductions well in excess of industry averages. However the required rates of reduction implied by the proposed NPRM curves between 2016MY and 2017MY are very challenging for lower volume, limited line manufacturers coming out of the Expanded TLAAS. JLR's fleet of passenger cars would be required to deliver circa **[ ]** CO_2 reduction as required by the NPRM. JLR's fleet of light trucks would be required to deliver circa **[ ]** CO_2 reduction as required by the NPRM. [Note: CBI information - **[ ] -** was omitted.] [EPA-HQ-OAR-2010-0799-8102-A1, p. 2]

Organization: Natural Resources Defense Council (NRDC)

4. Temporary Leadtime Allowance Alternative Standards Should Not be Extended to Model Years 2017-2025

NRDC agrees with the EPA proposal to end the Temporary Leadtime Allowance Alternative Standards with the 2016 model year. This exemption from the established 2012-2016 ramp-up—along with a generous early credit proposal, inclusion of FFV credits for MY 2012-2015, transferring credits between car and truck fleets, and 3-year carry forward of deficits—was provided so that all manufacturers had a pathway to comply with 2016 GHG standards. [EPA-HQ-OAR-2010-0799-9472-A2, pp. 13-14]

Organization: Porsche Cars North America, Inc. (PCNA)

Introduction:

On behalf of Dr. Ing, h.c. F. Porsche Aktiengesellschaft (“Porsche AG"), Porsche Cars North America Inc. (“PCNA," and, collectively with Porsche AG, "Porsche") is pleased to provide the following comments on the Notice of Proposed Rule Making (NPRM) regarding 2017 and Later Model Year Light Duty Vehicle GHG Emissions and CAFE Standards.

Porsche submits these comments in view of the fact that it has been recently announced that it is no longer realistic to achieve the once-planned merger between Volkswagen AG and Porsche Autornobil Holding SE (“'Porsche SE") within the framework and timeframe of the basic agreement from 2009. Porsche AG is a wholly owned subsidiary of Porsche Zwischenholding GmbH, which in turn is held by Porsche SE (50.1 percent) and Volkswagen AG (49.9 percent).

Nonetheless, Porsche SE and Volkswagen AG each also have reconfirmed their intention by some means to become part of an integrated automotive group. Both companies are currently examining whether alternatives to the measures provided for in the 2009 basic agreement are available. To the extent that such an alternative transaction is identified, and to the extent that such a transaction would materially change Porsche's status such that a supplement to these comments would be in order, Porsche reserves the possibility that it may do so.

2. Unequal burden: The goal of overall GHG reduction for the industry requires contribution from all manufacturers, but must account for the trajectory required for particular manufacturers. Transition from TLAAS to the base standards is a disproportionate burden for niche car makers. That transition cannot be accomplished by gradual incremental improvements. [EPA-HQ-OAR-2010-0799-9264-A1, p. 7]

3. Economy of scale: Porsche faces cost challenges due to its size (less than 0.25% of U.S. industry sales). Our development costs for new technology cannot be spread over a large fleet to take advantage of natural economies of scale. There is a disproportionate financial impact on small manufacturers, due to higher per unit cost. [EPA-HQ-OAR-2010-0799-9264-A1, p. 7]

4. Skewed competition: Porsche's positioning among our direct competitors in the sports car segment is a disadvantage. Our larger competitors can support sports car sales by fleet averaging over abroad range of products. EPA has also proposed that our smallest competitors can request alternate 'lowest feasible' CO_2 standards. Porsche cannot employ either of these options. Thus, the playing field is not level. [EPA-HQ-OAR-2010-0799-9264-A1, p. 7]

5. Availability of credits: We expect that many manufacturers will forego credit banking in order to expand sales of more profitable non-compliant models. Further, uncertainty will encourage other manufacturers to retain unused credits as insurance against the risk of catastrophic noncompliance in future years. Therefore, we believe it is unlikely that GHG credits will be readily available for sale on the open market. In fact, during the 2012-2016 GHG rulemaking, the Agencies acknowledged that experience shows that manufacturers do not sell credits. A business case cannot be built around such uncertainties that threaten our very existence. [EPA-HQ-OAR-2010-0799-9264-A1, p. 7]

In the absence of alternative standards, current TLAAS manufacturers would face a 25% reduction in GHG standards at the expiration of TLAAS following MY 2016. Due to Porsche's unique position in the market, we believe that those standards as proposed would create a hurdle that would drive us from the marketplace. We urge the agencies to consider alternatives which do not unjustly punish small specialty car manufacturers.

Porsche AG is a low volume manufacturer of premium high performance sports vehicles, targeted to a very small niche market. To assume that a performance car is in the same category as an economy sedan is to impose requirements that ignore the constraints of the laws of physics. It is certainly well accepted that it would be inappropriate for SUVs and light trucks to be subject to the same standards as passenger cars with similar footprints. Similarly, we believe it is not appropriate to set identical GHG standards for small economy vehicles and specialty performance machines, because of their vastly different design criteria and different market segments. [EPA-HQ-OAR-2010-0799-9264-A1, p. 7]

The consequence of setting uniform standards is illustrated in the following tables taken from the NPRM, showing technology penetration for Model Years 2021 and 2025, As these tables show, Porsche would be expected to employ far greater electrification than any other manufacturer. This absurd compliance path would place us at a severe competitive disadvantage with respect to development costs, and in the consumer market. [The tables can be found on p. 8 of Docket number EPA-HQ-OAR-2010-0799-9264-A1] [EPA-HQ-OAR-2010-0799-9264-A1, p. 8]

It is essential that a regulatory framework strive to accomplish its goals without interfering with natural free·market competition, Fair trade and free commerce demand a rule book that does not favor one business model over another. For the rules to be marketplace neutral, accommodation is needed for the unique challenge facing low volume niche manufacturers, yet without precipitating an unfair advantage over larger manufacturers who compete in those same niche markets. [EPA-HQ-OAR-2010-0799-9264-A1, pp. 8-9]

Porsche recommends three possible approaches for setting niche vehicle standards: fixed alternative standards, competitive standard setting, and alternate phase-ins. All three models would force Porsche to make significant GHG improvement equaling or exceeding the rest of the industry, but without imposing unrealistic targets likely to put us out of business.

<u>Alternative Standards</u>

Porsche suggests that a limited low volume alternative standards model similar to TLAAS is appropriate for the niche car market. We applaud the current TLAAS provisions, which require Porsche to make an annual GHG improvement comparable to the broader industry, without requiring wholesale restructuring of our market presence and without imposing an unfair competitive disadvantage either to us or to our competitors. [EPA-HQ-OAR-2010-0799-9264-A1, p. 9]

We estimate that the size of the industry's TLAAS fleet is on the order of 2% to 3% of total sales. The use of TLAAS standards at 125% of the base standards therefore has a minimal net effect on industry GHG performance in the 2012-2016 period. We believe that by further reducing the size of the TLAAS fleet (e.g., by 50% to 25,000 vehicles per manufacturer per year), the impact on industry-wide GHG would be negligible. A program like TLAAS is a sensible approach to achieving significant GHG benefits without interfering with the marketplace. We urge the agencies to continue to include alternative standards for the niche offerings of both small and large manufacturers. [EPA-HQ-OAR-2010-0799-9264-A1, p. 9]

Alternatively, we believe it would make sense to set GHG targets based on a sliding scale in proportion to market share / sales volume. This model would account for the relative ability of each manufacturer to weather increasing stringency, and to realize a return on the required technology investment. Conversely, as an OEM's sales and/or market share increase over time, it would make sense to adjust to more stringent GHG targets to reflect its increased capabilities. [EPA-HQ-OAR-2010-0799-9264-A1, p. 9]

Competitive Standard Setting

Standards for small volume niche manufacturers should not be more stringent than the GHG performance of their competitors' comparable models. Porsche proposes that small volume OEMs would have standards for each model set to the average GHG performance of competitor vehicles with similar horsepower, power/weight ratio, and type of technology employed (Diesel, Y-6 Turbo, conventional hybrid, PHEY, etc.). This will ensure a level playing field in competition with larger manufacturers which are using fleet averaging. [EPA-HQ-OAR-2010-0799-9264-A1, pp. 9-10]

This approach would be modeled after provisions for lower volume car makers described in California's LEY-II / Pavley I model, and in the successful "Top Runner' model used in other countries. It is an apples-to-apples variable standard that guarantees a neutral application of standards among all competitors. By definition, this strategy will force smaller manufacturers to make annual GHG improvements equaling or exceeding the improvement of comparable models, and without disrupting healthy competition. The following text outlines LEY-II provisions for lower volume manufacturers: [EPA-HQ-OAR-2010-0799-9264-A1, p. 10]

[§ 1961.1. Greenhouse Gas Exhaust Emission Standards and Test Procedures (D) Requirements for Small Volume Manufacturers and Independent Low Volume Manufacturers.

1..... [EPA-HQ-OAR-2010-0799-9264-A1, p. 10]

2. At the beginning of the 2013 model year, each small volume manufacturer and independent low volume manufacturer shall identify all 2012 model year vehicle models, certified by a large volume manufacturer that are comparable to that small volume manufacturer or independent low volume manufacturer's 2016 model year vehicle models, based on horsepower and horsepower to weight ratio. The small volume manufacturer and independent low volume manufacturer shall demonstrate to the Executive Officer the appropriateness of each comparable vehicle model selected. Upon approval of the Executive Officer, s/he shall provide to the small volume manufacturer and to the independent low volume manufacturer the CO_2- equivalent value for each 2012 model year vehicle model that is approved. The small volume manufacturer and independent low volume manufacturer shall calculate an average greenhouse gas emissions value for each its greenhouse gas vehicle test groups based on the CO_2-equivalent values provided by the Executive Officer. [EPA-HQ-OAR-2010-0799-9264-A1, p. 10]

3. In the 2016 and subsequent model years, a small volume manufacturer and an independent low volume manufacturer shall either: a. not exceed the fleet average greenhouse gas emissions value calculated for each GHG vehicle test group for which a comparable vehicle is sold by a large volume manufacturer, in accordance with section 1961. Hal(l)(D12: J [EPA-HQ-OAR-2010-0799-9264-A1, p. 10]

Porsche believes that such a standards framework upholds the spirit of worldwide GHG policy, in that all participants are expected to contribute to the overall emission reduction goals. Even niche players in the high powered sports car segment will contribute to innovation and efficiency improvement. Indeed, such a framework would ensure a thriving, competitive performance car segment, leading to innovations applicable to the entire industry. [EPA-HQ-OAR-2010-0799-9264-A1, p. 10]

Alternate Phase-In

If long-term alternate standards or competitive standards are unacceptable, we suggest an alternate phase-in to the base standards. This would mitigate the potential 25% drop in GHG standards at the expiration of TLAAS. It is important to consider that the length of Porsche's product cycles is 2- to 3- times the typical industry product cycle, in order to allow recovery of investment costs over small annual volume. An extended phase-in would be critical to Porsche's survival. [EPA-HQ-OAR-2010-0799-9264-A1, p.11]

The phase-in suggested below is a linear trajectory, starting from MY 2015 TLAAS, and ending at the MY 2025 base standards. This example illustrates GHG targets for one subset of Porsche's portfolio (small footprint sports cars). Similar curves can be drawn for other TLAAS products. [EPA-HQ-OAR-2010-0799-9264-A1, p.11]

It should be emphasized that this alternate phase-in would require an average 5.2% annual GHG reduction for these models, compared to 4.0% for vehicles which are already subject to the base standards in MY 2015. While such a phase-in would be a challenge, it does accommodate the long range planning needed to develop entire new product lines. [EPA-HQ-OAR-2010-0799-9264-A1, p.11]

Organization: Volkswagen

Volkswagen also submitted comments noting a gap in the MYs 2012-2016 TLAAS provisions involving a situation where TLAAS-eligible companies not participating in TLAAS merge with a TLAAS participant and the merged entities sales remain less than 400,000 units. VW requested that in such circumstances the companies should have the same administrative options as the rules provide for non-TLAAS participants merging with TLAAS participants where the merged entities sales exceed 400,000 units.

Response:

EPA did not propose to and is not extending the Temporary Leadtime Allowance Alternative standards (TLAAS) program per se. EPA received supportive comments regarding not extending TLAAS along the lines of the MYs2012-2016 program and received no comments recommending that the full-scale TLAAS program be extended.

EPA requested comments on whether there is a need to provide some type of additional lead time flexibility for intermediate volume, limited line manufacturers. EPA received supportive comments regarding providing some flexibility to intermediate volume manufacturers. Three manufacturers, Suzuki, Jaguar Land Rover, and Porsche provided specific recommendations and supporting rationale. EPA has carefully considered the comments regarding the need for additional flexibility for intermediate volume manufacturers. These manufacturers are eligible for the expanded TLAAS provisions in the MYs 2012-2016 rules which provide less stringent CO_2 standards through MY 2016 for manufacturers with U.S. sales below 50,000 vehicles. EPA understands the feasibility concerns raised by the manufacturers with regard to the significant increase in stringency represented by the change in standards under the TLAAS program in MY 2016 and the MY 2017 primary program standards. EPA is providing additional lead-time flexibility to these intermediate volume manufacturers through MY 2020 to help ease the transition to the MY 2017-2025 program. A more detailed review of the comments and EPA's response is provided in preamble Section III.B.6. The feasibility of the standards is discussed in Section III.D.6 of the preamble. As shown there, these intermediate manufacturers do face disproportionate compliance challenges in the early model years of this program. See Table III- 28 (JLR projected to require 23 % HEV, 2% PHEV, and 7% EV to meet MY 2021 combined fleet standard; these technology penetrations are considerably more challenging than for larger manufacturers; see also EPA RIA table 5.1.6 showing similarly disproportionate costs to meet the MYs 2019-2021 standards, even after the additional lead time afforded by the final rule.

Porsche notes that the company submitted comments under the assumption that they would remain independent from Volkswagen and that if the status of their relationship changed such that a supplement to their comments would be in order, Porsche reserved the possibility that it may submit such comments. On August 1, 2012, VW completed its acquisition of 100 percent of Porsche's automotive business.[6] While Porsche has not submitted follow-up comments, it is

[6] "Volkswagen and Porsche finalize creation of Integrated Automotive Group," Volkswagen news release, August 1, 2012.

EPA's expectation that Porsche will no longer be eligible for the expanded TLAAS program or the leadtime provisions discussed above since it will no longer be an intermediate volume manufacturer. EPA expects that Porsche's fleet will be absorbed into VW's fleet for purposes of determining compliance with the GHG standards. Nevertheless, EPA has considered Porsche's comments and recommendations with regard to intermediate volume manufacturers.

Fisker comments that manufacturers using the expanded TLAAS provisions are required to make a good faith effort to purchase credits and strongly encourages EPA to hold to the spirit of these provisions. In response, although the comments are on the implementation of the MY 2012-2016 program and not the MY 2017-2025 proposal, EPA understands the commenters concerns. The requirements for expanded TLAAS manufacturers to make a good faith effort to purchase credits remains in place as a regulatory requirement. EPA notes that the expanded TLAAS provisions will not be accessed by eligible manufacturers until the base TLAAS program maximum allowance has been reached. The base TLAAS program allows manufacturers to place a cumulative total of 100,000 vehicles into TLAAS in MYs 2012-2015.

Finally, EPA agrees with VW that the TLAAS provisions on mergers contain an inadvertent gap, and is clarifying those provisions in response to the comment. See preamble section III.E.7.h.

2.4. Mid-term Evaluation

Organizations Included in this Section

Alexandria Hyundai
Alliance of Automobile Manufacturers
American Honda Motor Co., Inc.
American Medical Association of California
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
Center for Biological Diversity
Chrysler Group LLC
Consumer Federation of America (CFA)
Ecology Center
EcoMotors International, Inc.
Ferrari
Ford Motor Company
General Motors Company
Honeywell International, Inc.
Honeywell Transportation Systems
House of Representatives, Congress of the United States
Hyundai America Technical Center
Institute for Policy Integrity, New York University School of Law
International Council on Clean Transportation (ICCT)
Johnson Controls, Inc.
Kia Motors

Marshall, C.
Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)
Mass Comment Campaign (375) (Union of Concerned Scientists-2)
Mass Comment Campaign (9,570) (Unknown Organization)
Mercedes-Benz USA, LLC
Mitsubishi Motors R&D of America, Inc. (MRDA)
Motor & Equipment Manufacturers Association (MEMA)
National Association of Clean Air Agencies (NACAA)
National Association of Manufacturers (NAM)
National Automobile Dealers Association (NADA)
Natural Resources Defense Council (NRDC)
Nissan North America, Inc.
Northeast States for Coordinated Air Use Management (NESCAUM)
Pew Charitable Trusts
Porsche Cars North America, Inc. (PCNA)
RVIA
Securing America's Future Energy (SAFE)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Toyota Motor North America
U.S. Chamber of Commerce
Union of Concerned Scientists (UCS)
United Automobile Workers (UAW)
United States Senate
University of Michigan
Volvo Car Corporation (VCC)
Weiner, L.

Organization: Alexandria Hyundai

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 66.]

As a contingency, if consumers in fact reject these vehicle offerings, it is my understanding the midterm review provides an opportunity to reset the goals if the needed technology cannot be provided at a reasonable price.

Organization: Alliance of Automobile Manufacturers

The Alliance supports the proposal to include an in-depth mid-term evaluation. [EPA-HQ-OAR-2010-0799-9487-A1, p.3]

This rulemaking reaches an unprecedented 13 years into the future. A mid-term evaluation process will allow the agencies to review a broad range of factors and make appropriate adjustments. It will provide better data and insight on a range of issues relevant to the appropriateness of the MY 2022-2025 standards, including consumers' willingness to buy the vehicles that are required to comply with the standards; future fuel pricing; and technology and raw materials costs. The Alliance comments on the mid-term evaluation include additional topics that the agencies should review. We recommend that, in addition to the proposed formal mid-term evaluation, the agencies continue their open dialogue and also conduct a series of smaller, focused technical evaluations - or “check-ins” - on the key assumptions of the proposal. The Alliance also requests a more specific description of the mid-term evaluation process and the specifics to be reviewed, including the timeline and procedures for assuring that the studies the agencies rely on are appropriately peer reviewed. [EPA-HQ-OAR-2010-0799-9487-A1, p.3]

The Alliance Supports the Proposal to Include an In-Depth Mid-Term Evaluation. [EPA-HQ-OAR-2010-0799-9487-A1, p.6]

The MY 2017-2025 GHG proposal includes provisions requiring EPA to conduct a mid-term evaluation of the MY 2022-2025 light-duty GHG standards to determine whether those standards remain appropriate in light of technological and other changes that may have occurred since the time of proposal. This evaluation process will be coordinated with NHTSA's effort to set final, binding CAFE standards for the 2022-2025 model years. The mid-term evaluation will include consideration of up to date information, a “holistic assessment of all of the factors considered by the agencies in setting standards” and the “expected impact of those factors on the manufacturers’ ability to comply.” To facilitate the evaluation, EPA (along with NHTSA and CARB) will publish a draft Technical Assessment Report (TAR), which will be peer-reviewed and made available for public comment. EPA also will request comment on whether the MY 2022-2025 standards remain appropriate under section 202(a) of the Clean Air Act (CAA) and whether the standards should be made more or less stringent. No later than April 1, 2018, EPA will make a final determination whether the MY 2022-2025 standards, as adopted in 2012, are appropriate. This process also is intended to guide NHTSA’s decision-making regarding its MY 2022-25 CAFE standards. If EPA concludes that the standards are not appropriate, the agency will then initiate a rulemaking to adopt standards that are appropriate under section 202(a). Both EPA and NHTSA have stated that that they would issue a joint rulemaking at least 18 months prior to the beginning of the 2022 model year, consistent with the statutory directive in the Energy Policy and Conservation Act of 2005 (EPCA). [EPA-HQ-OAR-2010-0799-9487-A1, p.6]

The Alliance consistently has advocated that a mid-term evaluation is more than just appropriate; it is a critical component of this rulemaking package if these GHG and CAFE standards are to be successful. This rulemaking will govern vehicle production 13 years from now, a particularly long time period when predicting technologies, costs, infrastructure, fuels and consumer behavior. It comes on the heels of a five-year rulemaking that will, according to the agencies, cost automakers almost $52 billion – the highest cost of any rulemaking imposed to date on the auto industry. The agencies estimate the additional GHG reductions and fuel economy gains from this rule will cost automakers an additional $133-157 billion, bringing the combined cost of the MY 2012-25 rules to somewhere between $185 and $209 billion. This unprecedented effort and expense will further our country’s energy and environmental goals, but only if consumers choose to purchase these fuel-efficient, climate-friendly vehicle technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.6]

By necessity, the GHG and CAFE standards proposed here are predicated on significant assumptions regarding the future - including such factors as the pace of technological innovation, deployment of supportive infrastructure for alternative fuels and advanced vehicles, rates of market penetration for new vehicle technologies, future costs of emerging technologies, fuel cost and availability and consumer acceptance. The agencies have attempted to make reasonable projections based on recent data. Nevertheless, the proposed standards cover an unusually long time horizon, governing the production of vehicles over a decade into the future. The mid-term evaluation will allow the agencies to determine whether the CAFE and GHG standards should be adjusted as a result of customers' willingness to buy vehicles that are required to comply with the standards, developments in technology, costs, safety, fuels, infrastructure and other relevant factors. [EPA-HQ-OAR-2010-0799-9487-A1, p.7]

Thirteen years into the future, consumer purchasing patterns will be the biggest unknown. Besides fuel economy, we know that consumers demand affordability, safety, convenience, performance and utility. One challenge we face is that fuel economy considerations often rank below these other attributes. Fuel prices, which are especially difficult to project, have a huge impact on how consumers weigh fuel economy at the dealership. All of this explains why the final rule should include a rigorous mid-term evaluation. [EPA-HQ-OAR-2010-0799-9487-A1, p.9]

Adherence to the Mid-Term Evaluation Process and Timing is Critical. [EPA-HQ-OAR-2010-0799-9487-A1, p.7]

EPA has proposed that the MY 2022-2025 GHG standards "will remain in effect unless and until EPA changes them by rulemaking." EPA has not specifically provided for expedited judicial review of the results of the final mid-term evaluation or any final rule setting revised MY 2022-2025 GHG standards. [EPA-HQ-OAR-2010-0799-9487-A1, p.7]

The Alliance would like to stress how important it is that both agencies follow the mid-term evaluation process laid out in the regulations, including strict adherence to the deadlines. Following the process as proposed should enable the agencies to consider all relevant issues, make an informed decision about the appropriateness of the MY 2022-2025 standards, and allow sufficient time for the promulgation of different standards and/or judicial review, if necessary. The purpose of the mid-term evaluation provision is to ensure that the assumptions underlying the MY 2022-2025 standards remain valid; to the extent that the assumptions are incorrect and the standards are inappropriate, the burden is likely to fall primarily on vehicle manufacturers. If EPA fails to follow the mid-term evaluation process or fails to meet the deadlines, it is probable that EPA will not have complied with the Section 202(a)(2) mandate to provide adequate time for the development and application of the technology required to comply with such standards. Moreover, failure to conduct the midterm evaluation or to meet the deadlines would constitute a failure to perform a nondiscretionary duty and/or final agency action. [EPA-HQ-OAR-2010-0799-9487-A1, pp.7-8]

In making this comment, we wish to stress that the Alliance does not assume that EPA or NHTSA intend to deviate from the mid-term evaluation process or ignore its deadlines. We believe that all parties, including the agencies, will work in good faith to follow the process. We merely wish to stress that the success of the mid-term evaluation depends on close adherence to the process and the deadlines. If anything is allowed to undermine or delay the process, it creates a significant potential for disputes and difficulties in the future, something we all hope to avoid. [EPA-HQ-OAR-2010-0799-9487-A1, p.8]

The Agencies Should Conduct Periodic Technical "Check-Ins." [EPA-HQ-OAR-2010-0799-9487-A1, p.8]

In the time leading up to the mid-term evaluation - and following the completion of the evaluation - the agencies should continue to check the validity of the assumptions upon which their standards are based. We suggest not only one formal mid-term evaluation, as the agencies have proposed, but also a series of smaller, focused, technical evaluations of, or "check-ins" on, the key assumptions of the proposal. These "check-ins" will allow the agencies to consider the latest relevant technical information, and thereby help the agencies keep the program on track and produce the best long term results. By having these "check-ins" the agencies will be better prepared to begin their formal mid-term evaluation and to make appropriate adjustments during the second half of the period covered by these regulations. [EPA-HQ-OAR-2010-0799-9487-A1, p.8]

The Alliance understands that EPA's mid-term evaluation will take place concurrently, and in conjunction with, NHTSA's process for setting final CAFE standards for MY 2022-2025. The agencies should jointly examine progress achieved towards compliance with the standards, and assess the latest information available on key assumptions and trends used to develop the standards, including the criteria set forth for determining maximum feasible fuel economy standards in 49 U.S.C. § 32902(f). Factors that should be considered include, but should not be limited to: [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Development of powertrain improvements to gasoline and diesel-powered vehicles; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Level of employment in U.S. automotive sector; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Availability and implementation of methods to reduce weight while assuring compliance with state and Federal safety, emissions and equipment laws and standards, and maintaining acceptable performance in consumer information crash testing and manufacturer due care testing; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Actual and projected combined sales of alternative fuel vehicles; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Actual and projected availability of public and private charging infrastructure for electric vehicles; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Actual and projected availability of low carbon and technology-enabling fuels and infrastructure, along with adoption and implementation of clean and renewable energy standards; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Costs, including average costs of technologies to ensure compliance with the standards, such as vehicle batteries and power electronics, mass reduction, and alternative fuels, and anticipated trends in these costs; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Current and expected availability of state and Federal incentives/subsidies for advanced technology vehicles; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Average payback periods for any incremental vehicle costs associated with meeting the standards, as well as up-front cost and impacts on consumer affordability; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Costs for gasoline, diesel fuel and alternative fuels; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Total light-duty vehicle sales and projected fleet mix; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Consumer demand for and customer acceptance of fuel-efficient technologies, and consumer valuation of fuel savings; [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

End-of-life costs associated with advanced technology vehicles; and [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Any other factors that may be deemed relevant to the review. [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Some recent studies attempt to identify opportunities for cost-effective near-term fuel economy improvements but also raise important questions about longer-term conditions. These questions call for information that is not yet available to EPA, NHTSA, the California Air Resources Board or any other party, including automobile manufacturers. The Alliance recommends that the mid-term evaluation focus on the issues as detailed below. During the evaluation, the agencies should seek expert peer-reviewed data and analysis, including the input of the National Academy of Sciences (NAS), to answer the following questions, among others: [EPA-HQ-OAR-2010-0799-9487-A1, p.17]

Given how little is known about the “energy paradox,” the Alliance supports NHTSA’s proposal to develop a Consumer Vehicle Choice Model to inform the mid-term evaluation. Such a model should also look at the other factors identified in the Preliminary RIA as having an impact on consumer purchasing decisions: sales taxes, insurance costs, the additional cost of auto loans and changes in resale value. To have credibility, the model needs to use real-world data, be developed in a transparent manner with full peer review, and should assess uncertainties in its predictions. [EPA-HQ-OAR-2010-0799-9487-A1, p.19]

Given the considerable uncertainty about future technology development, cost and consumer acceptability, the proposed mid-term evaluation is essential in order to assure that the maximum feasible fuel economy benefits are obtained in a cost-effective and safety neutral manner. [EPA-HQ-OAR-2010-0799-9487-A1, p.22]

Process for Conducting the Mid-Term Evaluation [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

The NPRM indicates that a draft Technical Assessment Report will be completed by November 15, 2017, and that EPA will make a final determination by April 1, 2018. The Alliance believes that a more detailed description of the process would be helpful. In particular, the final regulatory language should indicate that the agencies intend to perform a thorough analysis of consumer purchasing behavior, the single most important factor that will determine whether the goals of the program are being met. [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

The final regulatory language should also include the following important details: [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

start date of the evaluation and a schedule for major milestones to assure that the review is completed in time for EPA to make a fully informed regulatory determination; [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

specific studies the agencies plan to conduct; [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

details of the peer review process; [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

availability of a pubic docket; [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

role of NAS in the mid-term evaluation; and [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

roles of other departments and agencies that provide or regulate alternative fuels and emerging technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.24]

Further, the Alliance suggests that multipliers, like many aspects of the program, be reviewed during the mid-term evaluation. Should the mid-term evaluation reveal continuing market challenges with advanced technology vehicles, extending the multipliers beyond MY 2021 may be necessary to encourage fleet penetration. [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 96-97.]

That's why it's critical that the final rule include a rigorous mid-term review with a clearly defined process for its implementation.

During the review, the agencies should seek expert peer-reviewed information including the input of the National Academy of Sciences to answer these questions: Are the costs of advanced technologies declining as expected? Are researchers making the breakthroughs anticipated? What's happening with fuel prices, and how are consumers responding? What impact are the new requirements having on sales and on employment? How are the new rules impacting vehicle safety? What's happened with fuel quality? Will liquid fuels support the fuel-efficient technologies that have been introduced? Will the new charging infrastructure be available to enable plug-in hybrids, battery electric vehicles and fuel cell vehicles to penetrate the market at the levels predicted?

Organization: American Honda Motor Co., Inc.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 121.]

The proposed mid-term review seems appropriate to us and we believe it will be essential to checking progress and making necessary adjustments that cannot be foreseen from this early date.

Organization: American Medical Association of California

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 48.]

As well as to whether any midterm program review that may be viewed by some as an opportunity to weaken the standards previously agreed upon. The midterm review may have ramifications for the State of California and the programs in place here. It will align with the national standards, and it must remain clear that California maintains its own Clear Air Act authority to enact our own rules more stringent than the federal rules due to our extreme air quality challenges.

Organization: Association of Global Automakers, Inc. (Global Automakers)

For this reason, we support the proposed mid-term review to reassess the stringency of the standards, including technology penetration rates, fuel costs, and most importantly, consumer acceptance. [EPA-HQ-OAR-2010-0799-9466-A1, p. 1]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 66.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 50-51.]

Due to the many uncertainties that are implicit in the technical and economic assumptions that form the basis for the proposed standards, we support the proposed mid-term review of the standards. We also support the recommendation made at the Detroit public hearing that the final rule should specify a clearly defined process for the review, with a designated list of questions to be addressed. In addition, we agree with the recommendation (again at the Detroit public hearing) that the agencies consider a series of more narrow reviews of key aspects of the standards. [EPA-HQ-OAR-2010-0799-9466-A1, p. 9]

The need for a mid-term review finds ample support in both EISA and the Clean Air Act, as both statutes require the promulgation of regulations that are based on the most up-to-date information concerning the costs and benefits of the technologies required to meet the standards. Indeed, because EISA prohibits the promulgation of fuel economy standards past the MY 2021, a mid-term evaluation is required before final CAFE standards can be promulgated for the 2022 through 2025 MYs. EISA provides that the Secretary shall "issue regulations under this title prescribing average fuel economy standards for at least 1, but not more than 5, model years." 49 U.S.C. § 32902(b)(3)(b). Congress included the 5 year limit, in part, because it recognized that the factors NHTSA must consider in adopting fuel economy standards—technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy, see 49 U.S.C. §32902(f)—are fluid and vary over time. Consequently, any attempt to weigh these factors today for standards that would not apply until the 2022 MY would be fraught with uncertainty and inherently arbitrary. [EPA-HQ-OAR-2010-0799-9466-A1, pp. 9-10]

The current rulemaking being jointly undertaken by EPA and NHTSA encompasses nine model years (MYs 2017 through 2025). Under the plain terms of the statute, any final fuel economy standards that are issued now and are applicable to a model year after 2021 would be invalid. The Notice of Proposed Rulemaking recognizes this concern and therefore states "[t]he second phase of the CAFE program, from MYs 2022–2025, represents conditional proposed standards . . ." 76 FR at 74,859. NHTSA correctly recognizes that "conditional" rulemaking in this instance "means to say that the proposed standards for MYs 2022–2025 represent the agency's current best estimate of what levels of stringency would be maximum feasible in those model years, but in order for the standards for those model years to be legally binding a subsequent rulemaking must be undertaken by the agency at a later time." Id., n.7. According to NHTSA, "[t]he passenger car and light truck CAFE standards for MYs 2022–2025 will be determined with finality in a subsequent, de novo notice and comment rulemaking conducted in full compliance with EPCA/EISA and other applicable law . . ." Id. at 75,166. [EPA-HQ-OAR-2010-0799-9466-A1, p. 10]

Global Automakers supports the intent expressed in the Notice of Proposed Rulemaking concerning the mid-term evaluation. However, we are concerned that the actual language of the proposed regulations goes too far in adopting final regulations for MY 2022 through 2025. Proposed 49 C.F.R. § 531.5(c) provides that "[f]or model years 2012–2025, a manufacturer's passenger automobile fleet shall comply with the fleet average fuel economy level calculated for that model year according to Figure 2 . . ." and provides the parameters for the fuel economy targets through the 2025 MY. Viewed in isolation, this provision would constitute final fuel economy standards for the 2022 through 2025 MYs. The standards are ostensibly made conditional through proposed subsection (e), which provides: "For model years 2022–2025, each manufacturer shall comply with the standards set forth in paragraphs (c) and (d) in this section, if NHTSA determines in a rulemaking, initiated after January 1, 2017, and conducted in accordance with 49 U.S.C. 32902, that the standards in paragraphs (c) and (d) are the maximum feasible standards for model years 2022–2025. . . .” [EPA-HQ-OAR-2010-0799-9466-A1, p. 10]

Global Automakers believes that a mid-term evaluation of the GHG emission standards is likewise not only permissible under the Clean Air Act, but also required because of the uncertainties inherent in projecting regulatory requirements nine to twelve years into the future. First, Section 202(a) plainly provides EPA with the authority for a mid-term evaluation. See 42 U.S.C. § 7521(a)(1) (providing that “[t]he Administrator shall by regulation prescribe (and from time to time revise)” motor vehicle emission standards) (emphasis added). [EPA-HQ-OAR-2010-0799-9466-A1, pp. 10-11]

Moreover, a mid-term evaluation is required under the Clean Air Act in view of the proposed regulations’ long regulatory horizon. The Clean Air Act requires that standards “shall take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.” 42 U.S.C. § 7521(a)(2). EPA’s determination concerning the appropriate level of stringency for GHG emission standards must be based upon reliable and up-to-date information. [EPA-HQ-OAR-2010-0799-9466-A1, p. 11]

Given the extremely long time-horizon of these proposed mobile source regulations, EPA has conceded a number of uncertainties in the analyses that underlie its current rulemaking. See, e.g., 76 FR at 74,881 (recognizing the “uncertainties regarding the benefit and cost values presented in this proposal”). For example, the NPRM states that EPA and NHTSA “did not consider technologies that are currently in an initial stage of research because of the uncertainty involved in the availability and feasibility of implementing these technologies with significant penetration rates for this analysis. The agencies recognize that due to the relatively long time frame between the date of this proposal and 2025, it is very possible that new and innovative technologies will make their way into the fleet, perhaps even in significant numbers, that we have not considered in this analysis.” Id. at 74,922. Global Automakers believes that the converse may also be true, i.e., the proposed standards are based on assumptions concerning the availability and market penetration of technologies up to 12 years into the future that may not prove entirely accurate. Consequently, Global Automakers believes that it would have been arbitrary and capricious for EPA to promulgate GHG emission standards for model years as far into the future as MY 2022-2025 without providing for a mid-term evaluation. [EPA-HQ-OAR-2010-0799-9466-A1, p. 11]

Organization: BMW of North America, LLC

An in-depth mid-term review is extremely important in order to monitor the development of external factors such as customer acceptance of more fuel efficient vehicles. [EPA-HQ-OAR-2010-0799-9579-A1, p. 1]

Therefore, an in-depth mid-term review is an extremely important pillar in the proposed rule in order to monitor the development of external factors which are not under the manufacturer's direct control. This review is critical for reassessment of what technology can deliver and what consumers are willing to buy. [EPA-HQ-OAR-2010-0799-9579-A1, p. 3]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 78-79.]

Organization: Center for Biological Diversity

H. The Agencies' Proposed Interim Rulemaking Should, at a Minimum, Be Based on a Presumption that the Stringencies of the Standards Will Not Decrease

We have already commented on the Agencies' proposed mid-term review in our response to the DEIS. We add here that the Agencies' proposed method of undertaking this review is faulty. They state they intend the review to be based on "(1) a holistic assessment of all of the factors considered by the agencies in setting standards . . . , and (2) the expected impact of those factors on the manufacturers' ability to comply, without placing decisive weight on any particular factor or projection." To the contrary, as fully explained above, the Agencies must place decisive weight on energy conservation. Yet, by highlighting manufacturers' ability to comply in a separate category, the Agencies tip their hand about a very different, and improper, weighing of the statutory factors. We further note the irony of requests by automakers for "frequent evaluations" of the MY 2017-2025 standards in light of their insistence that "certainty" of standards and extreme lead times are needed if stringencies are to be increased.110 Efforts to water down already insufficient standards by any means must be resisted. [EPA-HQ-OAR-2010-0799-9479-A1, pp. 24-25]

---

110 See Jason Plautz, Fuel Economy: Automakers Urge Frequent Evaluations of 2027-2025 Program, GREENWIRE, Jan. 17, 2012. [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

Organization: Chrysler Group LLC

This rulemaking will affect vehicles over thirteen years into the future. Many key elements such as technology development, technology costs, fuel costs, and customer acceptance can be difficult to accurately predict. Therefore, Chrysler strongly supports the agencies' proposal to hold a formal mid-term review of the 2022-2025 model year standards and informal monitoring of industry progress towards meeting the National Program goals. [EPA-HQ-OAR-2010-0799-9495-A1, p. 2]

For this reason the proposed mid-term review of the 2022-2025 MY standards is critical. Chrysler strongly supports this provision and encourages EPA and NHTSA (collectively, the "Agencies") to also establish regular informal reviews leading up to and following the formal mid-term review. [EPA-HQ-OAR-2010-0799-9495-A1, p. 5]

Chrysler notes that the Agencies have a firm legal basis to conduct the mid-term evaluation. (Attachment 1)

The Agencies have legal authority to conduct a formal mid-term evaluation which can affirm or modify standards promulgated for the 2022-2025 model years. [EPA-HQ-OAR-2010-0799-9495-A1, p. 6]

EPA and NHTSA have a firm legal basis to conduct the mid-term evaluation

EPA and NHTSA have ample authority under Section 307(d) of the Clean Air Act and the Administrative Procedure Act to reconsider regulations based on new information. See, e.g., 5 U.S.C. § 553(e) (providing for petitions to issue, amend or repeal a rule); 42 U.S.C. § 7607(b) (allowing petitions for review of a Clean Air Act rule based on new information); 49 U.S.C. § 32902(c) (authorizing the Secretary of the Department of Transportation to amend CAFE standards following notice-and-comment rulemaking under 5 U.S.C. § 553 and allowing for oral, transcribed presentations). [EPA-HQ-OAR-2010-0799-9495-A1, p. 7]

As described in the proposed rule, "NHTSA has a statutory obligation to conduct a separate de novo rulemaking in order to establish final standards for vehicles for the 2022-2025 model years and would conduct a mid-term evaluation as part of that rulemaking." 76 Fed. Reg. at 74,861. Under the Energy Policy Conservation Act ("EPCA"), NHTSA must set fuel economy standards at least 18 months before the beginning of each model year, 49 U.S.C. § 32902(a), and "must issue regulations … prescribing average fuel economy standards for at least 1, but not more than 5, model years." 49 U.S.C. § 32902 (b)(3)(B). Since NHTSA must go through future rulemaking to establish the MY 2022-2025 standards, a full consideration of the standards based on the record at the time of the rulemaking is essential. [EPA-HQ-OAR-2010-0799-9495-A1, p. 7]

EPA proposed a commitment to undertake a similar mid-term evaluation under the Clean Air Act. See 76 Fed. Reg. at 75,370 (proposed to be codified at 40 C.F.R. § 86.1818-12 (h)) ("Mid-term evaluation of standards. No later than April 1, 2018, the Administrator shall determine whether the standards established in paragraph (c) of this section for the 2022 through 2025 model years are appropriate under section 202(a) of the Clean Air Act, in light of the record then before the Administrator. An opportunity for public comment shall be provided before making such determination. If the Administrator determines they are not appropriate, the Administrator shall initiate a rulemaking to revise the standards, to be either more or less stringent as appropriate.").

As it is, agencies m [EPA-HQ-OAR-2010-0799-9495-A1, p. 7]ay not violate their own rules and regulations to the prejudice of others. See United States ex rel. Accardi v. Shaughnessy, 347 U.S. 260, 267 (1954); Steenholdt v. F.A.A., 314 F.3d 633, 639 (D.C. Cir. 2003) ("The Accardi doctrine requires federal agencies to follow their own rules, even gratuitous procedural rules that limit otherwise discretionary actions."). [EPA-HQ-OAR-2010-0799-9495-A1, p. 7]

The factors to be considered at the mid-term evaluation are the same as those that the agencies are obliged to consider in initially setting standards under their respective authorities. See 76 Fed. Reg. at 75,370 (proposed to be codified at 40 C.F.R. § 86.1818-12 (h)) (listing factors EPA must consider, including cost to producers and purchasers, as well as the feasibility and practicability of the standards and the impact of the standards on the automobile industry). Under EPCA, the Secretary is to consider "technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy." 49 U.S.C. § 32902(f). [EPA-HQ-OAR-2010-0799-9495-A1, p. 7]

NHTSA has interpreted economic practicability to include consideration of consumer choice, economic hardship for the automobile industry, and vehicle safety. 76 Fed. Reg. at 74,897 (footnote omitted) (discussing NHTSA approach to economic practicability under EPCA and explaining: "Consumer acceptability is also an element of economic practicability, one which is particularly difficult to gauge during times of uncertain fuel prices."); see also CEI I, 901 F.2d at 120, n.11; Center for Auto Safety v. NHTSA, 793 F.2d 1322, 1340 (D.C. Cir. 1986). [EPA-HQ-OAR-2010-0799-9495-A1, p. 7]

Under Section 202 of the Clean Air Act, EPA emissions standards:

"shall take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period." 42 U.S.C. § 7521(a)(2). [EPA-HQ-OAR-2010-0799-9495-A1, p. 8]

EPA has also acknowledged, at least as to choices among vehicles, the relevance of consumer acceptance in evaluating these factors. See MY 2012-2016 Final Rule, 75 Fed. Reg. 25,324, 25,467 ("Consumer choice remains a pertinent factor for EPA to consider in balancing the relevant statutory factors," citing International Harvester Co. v. Ruckelshaus, 478 F.2d 615, 640 (D.C. Cir. 1973)). In International Harvester, the court of appeals, recognizing that "[a]significant decrease in auto production will have a major economic impact on labor and suppliers to the [automobile] companies," concluded that the Administrator is required to consider issues of basic demand for new passenger vehicles in making technical feasibility and lead time determinations. Id. at 641. [EPA-HQ-OAR-2010-0799-9495-A1, p. 8]

Under Section 202, EPA also must consider safety impacts:

"…[N]o emission control device, system, or element of design shall be used in a new motor vehicle or new motor vehicle engine for purposes of complying with requirements prescribed under this subchapter if such device, system, or element of design will cause or contribute to an unreasonable risk to public health, welfare, or safety in its operation or function." 42 U.S.C. § 7521(a)(4)(A) (emphasis added). [EPA-HQ-OAR-2010-0799-9495-A1, p. 8]

As it is, the factors of "the requisite technology" and "appropriate consideration to the cost of compliance within such period" encompass the issues related to infrastructure, technology cost, consumer acceptance, and the other factors that the proposed rule directs EPA to consider. [EPA-HQ-OAR-2010-0799-9495-A1, p. 8]

The mid-term evaluation contemplates coordination between EPA and NHTSA, just as they have coordinated in developing the MY 2012-2016 rule and in developing the MY 2017-2025 proposal. Indeed, the United States Supreme Court has recognized that while the agencies' "obligations may overlap, . . . there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency." Massachusetts v. EPA, 549 U.S. 497, 532 (2007). [EPA-HQ-OAR-2010-0799-9495-A1, p. 8]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 53.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 60.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 25-26.]

We believe the midterm review is critical to determining whether the customer's buying, and will continue to buy the technology packages needed to comply with the standards year over year. Efforts to search for parameters that measure potential customer acceptance must not lose sight of the most important question: Are they buying the product? Measuring whether consumers will buy what we offer next year is already challenging. Speculating as far as 13 years in the future holds significant uncertainty and risk. A midterm assessment of the underlying rulemaking assumptions provides a critical and equitable mechanism o adjust standards for future consumer and technology uncertainties and is a primary reason Chrysler supports this program.

Organization: Consumer Federation of America (CFA)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 91-92.]

And finally, sixth, the proposed rule recognizes the need to stay in touch with reality.

So we have this midterm review, which I fully support, as you've heard the auto makers insist on it. But I actually believe when we get to the midterm review, we're as likely to increase the standards as decrease.

Because, one, we've used the very low gasoline price. And so I think it will be higher when we get there.

And, two, historically we've seen that the original projections of the cost of meeting technologies in every major standard proposed by this agency and NHTSA have always been too high.

Organization: Ecology Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 189.]

While we do have some concerns about the proposed mid-term review providing an opportunity to slow progress, we understand the need for potential adjustments due to many unknowns that far into the future. We are hopeful that such a review will show that even more progress is achievable.

Organization: EcoMotors International, Inc.

NHTSA is obligated to conduct a separate de novo rulemaking in order to establish final standards for MYs 2022-2025 vehicles. The agencies are therefore proposing to conduct a comprehensive midterm evaluation to assess the appropriateness of the MY 2022-2025 standards, based on an updated assessment of all the factors considered in setting the standards and the impacts of those factors on the manufacturers' ability to comply.

The auto industry faces great uncertainty over future technology developments and costs, customer acceptance of new technologies, and fuel prices. Additionally, it will require more than just automotive production for emissions reductions from advanced technology vehicles to be realized. There must be a national fueling and service infrastructure available to support these technologies if they are to achieve significant market penetration. Developing and establishing this infrastructure for the nation and establishing consumer confidence in new technologies will take time. All of these factors make it critical that OEMs foresee the ability to cope with unexpected events and changes. Given the uncertainty inherent in setting standards over such a long time period, EcoMotors supports the agencies' plans to conduct a coordinated mid-term evaluation of the standards. [EPA-HQ-OAR-2010-0799-9594-A2, pp. 13-14]

- Specific Recommendation: Conduct a coordinated mid-term evaluation, as proposed.

We look forward to further developments in this rulemaking. [EPA-HQ-OAR-2010-0799-9594-A2, p. 14]

Organization: Ferrari

Finally, it is essential for EPA and NHTSA to conduct a comprehensive mid-term evaluation, taking into account the long period covered by the proposed regulations, regardless the legal obligations for NHTSA. [EPA-HQ-OAR-2010-0799-9535-A2, p.10]

Organization: Ford Motor Company

• Mid term Evaluation: The proposal provides for a thorough mid-term evaluation, by no later than April 2018, to assess the appropriateness of the targets for model years 2022 through 2025. This provision is essential and must be maintained in the final rule. The market success of our industry, and hence that of our new and innovative products, is dependent upon many factors outside of our control, such as the price of fuel, the state of the economy, or the availability of affordable technologies and materials (for example, to support electrification, or light-weighting). The further we look into the future, the more difficult it is to predict these factors with accuracy. This is why the proposed mid-term evaluation of the 2022-2025 model year greenhouse gas standards is vital to this joint proposal. The mid-term evaluation provides an essential checkpoint to ensure that the standards for those model years are consistent with evolving market conditions. [EPA-HQ-OAR-2010-0799-9463-A1, pp. 2 and 5]

Mid-Term Evaluation

The proposed rules include provisions for a mid-term evaluation of the appropriateness of the MY 2022-2025 GHG standards. This mid-term evaluation is to be conducted concurrently with NHTSA's actions in setting final, enforceable standards for MYs 2022-2025. Under the proposal, EPA and NHTSA, along with CARB, will jointly prepare a draft Technical Assessment Report ('TAR') on the appropriateness and feasibility of the MY 2022-2025 GHG and Corporate Average Fuel Economy (CAFE) standards and make the report available to the public no later than November 15, 2017. The agencies will receive public comment on the TAR as well as the standards themselves. EPA will then determine, by April 1, 2018, whether the MY 2022-2025 standards are appropriate, taking into account a number of factors, including but not limited to factors specified in the regulatory language. If EPA determines the MY 2022-2025 standards are appropriate, it will issue a final decision to that effect, which will be judicially reviewable. If EPA determines the MY 2022-2025 standards are not appropriate, it will initiate a rulemaking to adopt appropriate standards under Section 202(a) of the Clean Air Act, and any final rule resulting from that process would also be judicially reviewable. Any such rulemaking would be conducted jointly with NHTSA's de novo notice-and-comment rulemaking to set final CAFE standards for MYs 2022-2025. Both agencies would presumably issue final standards for MYs 2022-2025 on or before April 1, 2020, which would provide the minimum allowable lead time for the MY 2022 standards under the CAFE law. [EPA-HQ-OAR-2010-0799-9463-A1, p. 6]

Given the extended timeframe for the rules, the mid-term evaluation provisions are essential to Ford's support of this rulemaking package. The proposed standards for model years 2022-2025 are premised on projected developments in fuel economy technology, anticipated improvements in infrastructure to support new kinds of powertrains, the willingness of consumers to accept new technologies, and other factors. To the extent that these assumptions turn out to be incorrect, adjustments to the MY 2022-2025 standards may be necessary. The mid-term evaluation provides a vital checkpoint to ensure that the MY 2022-2025 standards are realistic and that the manufacturers have a workable pathway to compliance. It is also essential that the agency decisions emerging from the mid-term evaluation be judicially reviewable. While we think it is unlikely that the agency's mid-term evaluation determination will be challenged in court, the possibility of such a challenge helps to ensure that the evaluation process will be robust and that the agencies will give full consideration to all comments. [EPA-HQ-OAR-2010-0799-9463-A1, p. 6]

Ford supports the mid-term evaluation provisions as proposed by EPA. We also offer the following comments, which are fully consistent with the existing provisions: [EPA-HQ-OAR-2010-0799-9463-A1, p. 6]

- Timing. In conducting the mid-term evaluation, it is very important that the agencies meet (if not beat) the deadlines set forth in the proposed rules. The TAR must be issued on time to allow for a reasonable public comment period, and the public comment period must be completed in a timely fashion for EPA to meet its April 1, 2018 deadline for making its determination. That deadline, in turn, must be met in case EPA needs to undertake a joint rulemaking with NHTSA to set new standards for MYs 2022-2025 and complete that rulemaking by April 1, 2020, which is NHTSA's statutory deadline for setting MY 2022 CAFE standards. If the mid-term evaluation process is allowed to lag, stakeholders who are concerned about the appropriateness of the MY 2022-2025 standards may have little choice but to initiate 'deadline' litigation or take other actions they believe to be consistent with their interests. If this occurs, the goal of an orderly, thoughtful mid-term evaluation process could be thwarted. Adherence to the timing set forth in the proposal is critical. [EPA-HQ-OAR-2010-0799-9463-A1, pp. 6-7]

- Coordination between EPA and NHTSA. Closely related to the timing issue is the importance of close coordination between EPA and NHTSA during the mid-term evaluation process. Consistent with the overarching goals of the One National Program framework, the midterm evaluation process needs to result in a joint rulemaking with harmonized CAFE and GHG standards for MYs 2022-2025. The harmonized standards should enable manufacturers to comply with both their GHG and CAFE obligations by building one fleet of vehicles that can be sold nationwide. In order to accomplish this, the degree of coordination between EPA and NHTSA during the mid-term evaluation needs to be no less than the degree of coordination involved in the pending joint rulemaking. The mid-term evaluation should not be viewed as an opportunity for EPA and NHTSA to go in different directions with respect to the GHG and CAFE standards. [EPA-HQ-OAR-2010-0799-9463-A1, p. 7]
- Factors to be considered. The proposed mid-term evaluation provision states that '…the Administrator shall consider information available on the factors relevant to setting greenhouse gas emission standards under Section 202(a) of the Clean Air Act for model years 2022 through 2025, including but not limited to…' *emphasis added+. The provision goes on to list a number of specific factors that the Administrator must consider. In Ford's view, the 'including but not limited to' language is an essential part of the mid-term review provisions. The factors that turn out to be most important six years from now are not necessarily foreseeable today, and not necessarily the ones listed in the proposed rule. As we understand the language, EPA must be open to the consideration of relevant factors not specifically listed, including relevant factors that may be raised in public comments received by the agencies. We urge EPA to maintain this language in the final rule, so that the midterm evaluation is as robust and comprehensive as possible. [EPA-HQ-OAR-2010-0799-9463-A1, p. 7]
- Holistic View. As part of the mid-term evaluation, the Agencies should take a broad view of the opportunities for reducing transportation-related CO_2 emissions and fuel consumption, with an eye toward determining whether it may be necessary to implement measures external to the auto industry in order to support and complement the vehicle standards. A holistic approach to GHG reduction and fuel savings has the potential to be much more effective than a tunnel-vision focus on vehicles alone. Along these lines, we direct your attention to comments submitted by the University of Michigan (Chock, Gonzalez, Zeilinski) regarding the importance of considering the role of consumer fuel usage as part of any effort to establish policies and regulations related to GHG emissions. Ford has been, and continues to be, actively involved in dialogue with a variety of entities (including governments, academic institutions, and NGOs) on such subjects as urban

> planning, congestion reduction, fueling infrastructure, and connectivity technologies to facilitate more efficient public and private transport. The ability of manufacturers to achieve the proposed vehicle standards may in part depend on the degree of progress our society is able to achieve in one or more of these other areas. Also, market fuel quality, particularly octane level, can have a significantly positive impact on all on-road vehicles and should therefore be a key part of our national strategy to improve energy security. These issues need to be on the table as part of the mid-term evaluation. [EPA-HQ-OAR-2010-0799-9463-A1, p. 7]

On balance, we believe that the proposed mid-term evaluation provisions set forth a meaningful and reasonable process for revisiting the appropriateness of the proposed MY 2022-2025 standards, with the benefit of the information gathered in the intervening years. Ford supports the inclusion of these provisions in the final rule, and we pledge to work with the agencies in a constructive manner toward final MY 2022-2025 standards that are workable and appropriate. [EPA-HQ-OAR-2010-0799-9463-A1, p. 8]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 45.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 34.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 86-87.]

This is why the proposed midterm evaluation of the 2022 to 2025 standards is so vital to this joint proposal. As proposed, the midterm evaluation provisions require EPA to make a fresh determination regarding the appropriateness of the post-2021 model year standards after considering a variety of factors and soliciting public comments. This process will take place concurrently with NHTSA's process for setting final standards for the 2022 to 2025 model years. The midterm evaluation is an essential checkpoint to ensure that the standards for these model years are consistent with evolving market conditions. The existence of a robust, meaningful midterm evaluation process is critical to Ford's support for this rulemaking package.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 44-47.]

The proposed rule extends to the 2025 model year which is an unprecedented time frame in the context of fuel economy regulations. This presents a significant challenge for manufacturers. While the establishment of longer-term standards provide manufacturers with targets for future product planning investment, the longer time frame leads to greater risk that the assumptions underlying the standards do not come to fruition.

Organization: General Motors Company

GM understands that the 2022-2025 standards will be evaluated further during the mid-term review. [EPA-HQ-OAR-2010-0799-9465-A1, p. 2]

GM supports an in-depth mid-term evaluation, and urges as well, a continuing open dialogue among industry and other affected parties, including a series of earlier, focused, technical evaluations, or “check-ins”, on the key assumptions upon which the proposed standards are based. [EPA-HQ-OAR-2010-0799-9465-A1, p. 2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 35-38, and 56.]

As this proposal makes many optimistic assumptions and sets goals all the way out to 2025, 13 years from today, it is imperative that we collectively check the validity of those assumptions as we move through that extended period of time. We suggest not only one formal mid-term review as the agencies themselves have planned for the proposal, but a series of smaller technical and detailed focused check-ins on the key assumptions contained in this proposal. These check-ins will allow the program to stay on track and lead to the best long-term results. Of course, the more formal mid-term review is also essential since NHTSA must itself conduct a separate rulemaking to set the requirements under the CAFE law for the final four years of this period.

But you have my commitment that we will provide whatever data, analysis, and input we can to help the agencies to make judgments and course corrections along the way.

Clearly this proposal represents a dramatic attempt to advance the mutual goals of CO_2 reduction and increased energy diversity. The mid-term review is essential to make sure that we also revisit the assumptions inherent in establishing these goals to make sure we have not overwhelmed technology development or the needs of consumers or their willingness to accept and pay for the associated changes in vehicles.

Organization: Honeywell International, Inc.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 258.]

As the agencies recognize, turbo technologies will contribute significantly during the model years covered by this rulemaking, the agencies should commit during the mid-term review to evaluate the availability of more advanced turbo technologies and to ensure an equal production incentive as any ongoing incentive provided to battery technology.

Organization: Honeywell Transportation Systems

Honeywell also encourages the agencies to commit in the final rule to a detailed review of emerging boosting technologies that may considerably advance vehicle emissions and fuel economy performance during the later years of the rulemaking. The agencies have already committed within the mid-term review to consider powertrain improvements to diesel and gasoline powered vehicles. New, advanced turbo technologies can facilitate those improvements and may be ripe for regulatory consideration during the time when the agencies intend to conduct the mid-term review. [EPA-HQ-OAR-2010-0799-9474-A1, p.6]

Honeywell's research and development into turbo advancements continues. We expect to contribute significantly to support emissions and fuel economy improvements in both the light duty and heavy duty fleets during the upcoming model years. We are investing in yet more advanced approaches that we expect will allow diesel and gasoline vehicles to compete favorably in the marketplace while substantially advancing their environmental performance. While many of these technologies are not yet available for regulatory consideration, we anticipate that new, additional turbo technologies will be on the technology menu during the mid-term review. [EPA-HQ-OAR-2010-0799-9474-A1, p.6]

The agencies' consideration of additional flexibilities and credits in the mid-term review should include such technologies. While the agencies will reconsider the viability of any incentives provided to electric drivetrains in the upcoming final rule, the agencies at the same time should consider providing equal treatment to ICE vehicles incorporating the boosting technologies that may be ripe for emergence during the model year 2022-2025 timeframe. [EPA-HQ-OAR-2010-0799-9474-A1, p.6]

Honeywell also requests that the agencies commit to ensuring that future turbocharging technology be accorded full consideration and treatment analogous to electric drivetrain technology during the mid-term review. [EPA-HQ-OAR-2010-0799-9474-A1, [p.6]

Organization: House of Representatives, Congress of the United States

In addition, we were pleased that the Administration intends to include a 'midterm' review for the 2022-2025 requirements. This provides an opportunity for the last set of increases to be re-visited to see if the assumptions on technology, costs, fuel prices, consumer acceptance and vehicle prices still support the standards that will be proposed, or whether their stringency should be revised upwards or downwards. [EPA–HQ–OAR–2010–0799-1221-A1, p. 1]

Organization: Hyundai America Technical Center

The agencies are proposing a comprehensive mid-term review prior to the final adoption of the MY 2022-2025 standards by NHTSA. Hyundai supports the standards as proposed and appreciates the substantial lead time provided by the regulations which will provide stability for long-term product planning. At the same time, the proposal covers nine model years, out to MY 2025, which makes it difficult to make accurate assumptions due to market uncertainties such as the price and viability of different fuel types, infrastructure availability, technology availability, technology penetration rates and cost, and consumer acceptance of technology. Therefore, Hyundai supports the mid-term evaluation because it provides an opportunity to ensure that the details of the program are appropriate and that the requirements are sound closer to the time of implementation. [EPA-HQ-OAR-2010-0799-9547-A1, p.2]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 173.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 23.]

We agree with the comments by Global Automakers that the final rule should specify a clearly defined process for the mid-term review with a set of specific questions that should be addressed. Additionally, we also support additional informal periodic reviews to monitor areas such as the state of technology, the effect of the proposed incentives and the viability of testing methods. [EPA-HQ-OAR-2010-0799-9547-A1, p.2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 173-174.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 24.]

Although we believe the proposed requirements are feasible, Hyundai recognizes that it is difficult to accurately predict out to the 2025 time frame the technologies and the cost and consumer acceptance of these technologies that will be necessary.

The mid-term review will help ensure that the requirements are sound closer to the time of implementation.

Organization: Institute for Policy Integrity, New York University School of Law

Factors for the Mid-Term Evaluation Should Specifically Include Benefit Estimate Revisions
The agencies should commit to developing better estimates of non-carbon dioxide benefits during the SCC revision process, ideally in time to incorporate such estimates in the final rulemaking.

Periodic review of ongoing regulations is a valuable check on efficiency,73 and the practice is now enshrined in executive order.74 The agencies' plan to conduct a mid-term evaluation of the rule in advance of model year 2022 is commendable. Unfortunately, EPA's list of relevant factors to consider during this review process lacks key elements. While there is a catch-all listing of "other factors," there is no specific mention of reviewing any changes in benefits estimates, such as any revised SCC values. The agencies should amend their list of factors to specifically reflect any potential changes to benefits estimates, in addition to changes to costs or the state of technology. [EPA-HQ-OAR-2010-0799-9480-A1, p. 11]

---

73 See Comments from Policy Integrity to EPA and DOT on Retrospective Review (Mar. 18, 2011, Apr. 1, 2011, June 27, 2011, July 3, 2011), available at http://www.policyintegrity.org.

74 Exec. Order 13,563 § 6.

Organization: International Council on Clean Transportation (ICCT)

10. ICCT enthusiastically supports a midterm review, as we believe it will find that costs have been significantly overstated. The criteria and analyses used for the midterm review should be similar to those used for any CAFE or greenhouse gas rulemaking process. EPA and NHTSA should also provide periodic status updates on technology progress and the results of additional benefit and cost analyses. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

10) Mid-Term Review

The ICCT enthusiastically supports a midterm review, as we believe the proposed rule significantly overstates the cost of compliance. Continued technology advancements will both increase the benefits of many technologies, such that not as much technology would need to be installed, and reduce the cost of technologies that are used. Capturing these future improvements in the midterm review will allow the agencies to increase the stringency of the 2022-2025 standards. [EPA-HQ-OAR-2010-0799-9512-A1, p. 22]

The process for the midterm review is critical to the 2022-25 standards. It is impossible to define all the criteria for the review at this time, just as it is not possible to define all of the criteria for any rulemaking process. EPA and NHTSA need latitude to apply their best analyses and base the requirements on the results of these analyses. The ICCT believes that the criteria and analyses used for the midterm review should be similar to those used for any CAFE or GHG rulemaking process. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 22-23]

The ICCT also recommends that EPA and NHTSA conduct periodic updates on technology progress and consider periodic status reports. Tear-down cost assessments should continue in order to assess the cost of newer technologies as they are introduced into the market. Simulation modeling also needs to be updated to keep pace with technology development. The scope and timing of reports should be up to the Agencies, but we see value in documenting progress in technology improvements and implementation. Manufacturers do not release details of their technology development, so periodic reports can summarize technology and cost developments and technology deployment for all interested parties, including other manufacturers. The ICCT also expects continued improvement in the science of assessing technology benefits and costs, which can be disseminated through the periodic progress reports. Forward-looking analyses would provide a better foundation going into the midterm review and should be updated as appropriate. [EPA-HQ-OAR-2010-0799-9512-A1, p. 23]

Organization: Johnson Controls, Inc.

Johnson Controls also supports the agencies' inclusion of a mid-term evaluation, which, as proposed, will provide all stakeholders with a comprehensive analysis so they may consider the current performance and ability to realistically deliver the MY 2017-2025 standards in the public docket. Long-term planning is an especially important factor in the battery industry as there are likely to be uncertainties in the product development cycle that could directly impact - positively or negatively - the commercial success of new products, as well as the return on investment required to expand the U.S. manufacturing base. Providing an opportunity for a thorough analysis is a critical and necessary component of this next National Program. [NHTSA-2010-0131-0253-A1, pp. 2-3]

Midterm Review should be supplemented by ongoing review and analysis during the course of the National Program. Midterm review is a critical component for this next National Program which covers eight years. Since the commencement of the midterm 'review is in the distant future, the industry encourages the agencies to be open to ongoing shared analysis and input to assess if the goals of the Program are being realized and/or if there are circumstances that drastically impact the marketplace or technology development. [NHTSA-2010-0131-0253-A1, p. 5]

Organization: Kia Motors

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 102.]

Kia appreciates these substantial lead times for these regulations which will provide stability in long-term planning. However, Kia believes it is important for the agencies to include mid-term evaluations to allow for revisions if some of the assumptions made in the drafting of the rule are not proven to be correct. Even though Kia supports the standards, Kia recognizes it is difficult to accurately predict the outcome -- to accurately predict how to deliver the 2025 technology in that time frame. Consumer acceptance of those technologies and costs will also be a challenge. The mid-term review will help us ensure that the standards are robust for all OEMs near to the time frame of implementation.

Organization: Marshall, C.

The idea of a review of the regulation in 2021 is a good concept but I think the lead-times for the vehicle manufacturing industry to retool are so long that I would suggest the review be held in 2019. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Organization: Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)

The agencies are proposing a 'mid-term' review that would begin soon after the standards come into effect. In the past, automakers have abused similar programs--turning them into off-ramps as opposed to reviews. It is critical that this review does not undermine the program through 2025. [EPA-HQ-OAR-2010-0799-10166-A2_MASS, p.1]

Organization: Mass Comment Campaign (375) (Union of Concerned Scientists-2)

The agencies are proposing a 'mid-term' review that would begin soon after the standards come into effect. In the past, automakers have abused similar programs--turning them into off-ramps as opposed to reviews. It is critical that this review does not undermine the program through 2025. [EPA-HQ-OAR-2010-0799-1246-A1_MASS, p.1]

Organization: Mass Comment Campaign (9,570) (Unknown Organization)

The agencies are proposing a 'mid-term' review that would begin soon after the standards come into effect. In the past, automakers have abused similar programs--turning them into off-ramps as opposed to reviews. It is critical that this review does not undermine the program through 2025. [EPA-HQ-OAR-2010-0799-9578-A1_MASS, p.1]

Organization: Mercedes-Benz USA, LLC

The mid-term review is critical to ensuring that the program remains feasible and is achieving GHG and fuel economy reductions without creating unintended economic, market and/or safety consequences. DAG strongly endorses the comments of the Auto Alliance with regard to the mid-term review. In addition to the various 'unknowns' identified in the Alliance comments, the mid-term review is essential to evaluate the structure of the program as applied to companies needing to expand their product offerings beyond the addition of advanced technology vehicles. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-2]

DAG also encourages the agencies to engage in periodic evaluations, in addition to the more formal and comprehensive mid-term review, to appraise (1) the extent to which the market has sustained the continued growth of hybrid vehicles and has accepted electric vehicles, (2) the extent to which the infrastructure to support battery electric, fuel cell and CNG vehicles has grown, and (3) whether efforts to meet the standards have resulted in adverse market or economic losses or product withdrawals. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-2]

Organization: Mitsubishi Motors R&D of America, Inc. (MRDA)

Supports the inclusion of a mid-term evaluation as fundamental for setting realistic fuel economy and GHG stringency levels for MYs 2022 through 2025. Recommends that effects of consumer incentives and EV charging infrastructure must be considered in the mid-term evaluation. [EPA-HQ-OAR-2010-0799-9507-A1, p.2]

Mitsubishi Motors fully supports the mid-term evaluation, included in proposed language in Section 86.1818–12(h), in preparation for setting fuel economy and GHG standards for MYs 2022 through 2025. This is not only necessary, but fundamental to setting informed and practical standards that account for the realities of the U.S. market. Mitsubishi Motors believes the following factors must be considered and incorporated into the mid-term evaluation: [EPA-HQ-OAR-2010-0799-9507-A1, p.2]

- · What are fuel price trends as compared to what was projected? [EPA-HQ-OAR-2010-0799-9507-A1, p.2]
- · Are consumers buying more fuel efficient vehicles in general? [EPA-HQ-OAR-2010-0799-9507-A1, p.2]

- · Does sufficient EV infrastructure exist to support current and future EV adoption? Have consumers adopted EVs in the numbers as projected by the agencies in the analysis done for the NPRM? [EPA-HQ-OAR-2010-0799-9507-A1, p.2]
- · Have there been any significant industry-wide economic setbacks making EV and overall fuel economy targets as proposed in the NPRM impracticable? [EPA-HQ-OAR-2010-0799-9507-A1, p.3]
- · Are financial and non-financial incentives and compliance flexibilities still necessary to continue to advance adoption of EVs? [EPA-HQ-OAR-2010-0799-9507-A1, p.3]
- · Have there been significant advances in smart grid development, energy management and battery storage? [EPA-HQ-OAR-2010-0799-9507-A1, p.3]

This is not an exhaustive list. Given our significant investment and commitment to EV commercialization, these are important areas of concern for Mitsubishi Motors in the MY 2022 through 2025 timeframe. After a thorough analysis and consideration of all necessary factors, CAFE and GHG stringency levels for MYs 2022 through 2025 should be set accordingly. [EPA-HQ-OAR-2010-0799-9507-A1, p.3]

The agencies have never proposed fuel economy (or GHG) regulations that reach 13 model years into the future. Additionally, the agencies? target for finalizing this rule will be well before NHTSA?s statutory requirement of publishing finalized requirements at least 18 months prior to the beginning of a MY. This unprecedented lead time lends itself to more questions rather than providing certainty for OEMs. [EPA-HQ-OAR-2010-0799-9507-A1, p.3]

Additionally, the mid-term evaluation is necessary since the product plans for MYs 2016 through 2020 are not as well-defined as the product plans for MYs 2010-2015. And, no OEM has detailed product plans for MYs 2021 through 2025. Although the product cycle development begins nearly 10 years before the launch of a vehicle, the commitment to product plans does not happen 10 years in advance. Product plans are set in general for approximately five years at a time. Projecting beyond five years in the future presents incremental uncertainties that those projections can be fulfilled for a number of reasons. The mid-term evaluation will help ensure that substantive analysis, rather than incrementally uncertain assumptions, support progressive yet realistic targets for the later years of this rulemaking. [EPA-HQ-OAR-2010-0799-9507-A1, p.3]

Much of the uncertainty involves making realistic assumptions for consumer acceptance of alternative fueled vehicles (AFVs) for MYs 2022 through 2025. In order to make accurate assumptions for this timeframe, NHTSA and EPA must evaluate consumer choices made during MYs 2017 through 2021. Given historical adoption rates of advanced technology vehicles, there needs to be a thorough evaluation for an EV multiplier in MYs 2022 through 2025 in order to continue to advance EV market penetration. [EPA-HQ-OAR-2010-0799-9507-A1, p.3]

To spur EV industry investment, President Obama established a national goal of 1 million electric vehicles on the road by 2015. Localities like the twin cities of Bloomington and Normal in central Illinois are working with Mitsubishi Motors and the Eaton Corporation through the EV Task Force to educate consumers, install EV charging infrastructure and deploy 1,000 Mitsubishi “i”s by 2014. OEMs are planning for significant increases in consumer adoption rates of EVs and PHEVs. These progressive targets and plans are noteworthy and encouraging. Ultimately however, only consumers can fulfill these plans. EPA should account for uncertainty regarding consumer acceptance by extending the EV multiplier in MYs 2022 through 2025. This will help sustain progress towards establishing a mass EV market. [EPA-HQ-OAR-2010-0799-9507-A1, p.3]

Overall, NHTSA?s Preliminary Regulatory Impact Analysis (PRIA) suggests that this rulemaking is economically practicable for the industry as a whole. Yet, details in the PRIA indicate that manufacturers? costs to incorporate advanced technology in vehicles vary greatly. Specifically, Table VII-1a (estimated average cost per passenger car over the adjusted baseline for MYs 2017 through 2025) in the PRIA projects that Mitsubishi Motors? projected costs are higher than any other manufacturer. By 2025, they are projected to be more than three times greater than the average. [EPA-HQ-OAR-2010-0799-9507-A1, p.3]

It is evident and expected that some companies will be absorbing more incremental costs to remain price competitive, especially manufacturers with fewer product lines. Some increased material and component costs can be passed onto a consumer. However, Mitsubishi Motors strives to offer competitively priced vehicles, and like other manufacturers, endeavors to limit transferring costs to consumers. In addition, some manufacturers, because of size and product mix, continually face unique challenges. To that end, the agencies requested comments related to challenges that “intermediate volume limited line manufacturers” may face in meeting the fuel economy and GHG standards for MYs 2022 through 2025. As noted in the NPRM, these challenges include securing competitive supplier contracts and having limited product lines across which to spread costs. Mitsubishi Motors? light duty vehicle sales account for approximately 0.6% of the U.S. market. As a manufacturer with more limited resources than many others in the U.S. market, adding advanced technologies to all vehicle models simultaneously is not feasible or practical. The mid-term evaluation should include consideration of compliance options specifically for OEMs with limited product lines. [EPA-HQ-OAR-2010-0799-9507-A1, pp.3-4]

In the mid-term evaluation, the agencies should also review assumptions about EV market penetration based on the availability and effect of consumer purchasing incentives. Although outside the scope of this rulemaking, EV incentives will continue to be a pivotal factor in spurring EV growth towards a mass market option. Mandating fuel efficiency and GHG emissions standards will not guarantee that a consumer will choose an electric drive vehicle. Pricing and charging infrastructure availability will be the main drivers in purchasing an EV. Financial and nonfinancial consumer incentives at the federal/state/local levels are necessary in the early stages of introduction for a distinct and new technology for most customers. It should be noted that relying on government tax incentives is not and cannot be a part of a sustainable long-term business plan for OEMs selling electric drive vehicles. However, if this technology is to become a significant part of the overall fleet, then government tax incentives are necessary for the beginning stages of commercialization. [EPA-HQ-OAR-2010-0799-9507-A1, p.4]

The mid-term evaluation should also consider available EV infrastructure when assessing past and future assumptions of EV market penetration. As noted above, charging infrastructure availability is key to a consumer's decision to purchase an EV. Currently, there is no national plan for EV infrastructure development to compliment the federal government's efforts to support EV industry growth and consumer acceptance of EVs. A national plan would help develop regional targets to establish EV infrastructure. Specifically, Mitsubishi Motors believes that EV charging infrastructure should be developed and prioritized according to the following: [EPA-HQ-OAR-2010-0799-9507-A1, p.4]

1. Home charging is the top priority and permitting processes must be streamlined. [EPA-HQ-OAR-2010-0799-9507-A1, p.4]

2. Workplace charging is the next priority because this supports increased EV adoption and enables future Vehicle to Grid energy storage concepts. [EPA-HQ-OAR-2010-0799-9507-A1, p.4]

3. Public Charging, especially DC quick charging, encourages adoption of EVs with smaller-sized, more resource efficient battery packs by increasing a vehicle's effective daily range. [EPA-HQ-OAR-2010-0799-9507-A1, p.4]

OEMs must be able to innovate while complying with practicable federal fuel efficiency and GHG regulations to match the realities of the U.S. market. Mitsubishi Motors supports the inclusion of a mid-term evaluation in order to realistically evaluate the assumptions for setting fuel economy and GHG standards in MYs 2022 through 2025. [EPA-HQ-OAR-2010-0799-9507-A1, p. 6]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 96.]

Mitsubishi Motors urges the agency to work with stakeholders well in advance of the midterm evaluation to develop sound review process and framework.

Organization: Motor & Equipment Manufacturers Association (MEMA)

MEMA also strongly supports the agencies' inclusion of a mid-term evaluation. That way, all stakeholders can perform a comprehensive and transparent assessment to see if the goals of the Program are being realized and/or if there are circumstances that drastically impact the marketplace or technology development, which may call for appropriate revisions. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

Midterm Review is a key component of the National Program for MYs2017-2025. We support an assessment to ensure that the goals are being realized and/or to address any circumstances that drastically impact the marketplace or technology development to warrant revisions. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

MEMA strongly supports the agencies' inclusion of a mid-term evaluation, which, as proposed, will provide a complete comprehensive analysis for all stakeholders to consider the current state-of-play and practicability of the MY2017-2025 standards in the public docket. Long-term planning is an especially important factor in the motor vehicle industry as there are likely to be uncertainties in the product development cycle that could directly impact – positively or negatively – the commercial success of new products and the return on investment required to expand the U.S. manufacturing base. Outside of the formal midterm review, it seems reasonable that there should be an ongoing dialogue between all of the stakeholders leading up to the midterm review. [EPA-HQ-OAR-2010-0799-9478-A1, p.5]

MEMA supports a complete assessment of the Program to ensure that the goals are being realized and/or if there are any circumstances that drastically impact the marketplace or technology development to warrant revisions to the standards. Providing an opportunity for a thorough analysis is a critical and necessary component of this next National Program. [EPA-HQ-OAR-2010-0799-9478-A1, p.5]

Organization: National Association of Clean Air Agencies (NACAA)

Further, once this program is in place, it is critical that EPA and NHTSA closely track progress in meeting the standards. In addition, the mid-term evaluation to be conducted in the 2021-2022 timeframe should evaluate the use of credits by automobile manufacturers and the impact of credit use on average fleet performance. In particular, EPA and NHTSA should evaluate whether credit use is allowing the production of a greater number of vehicles that do not meet the 5-percent rate of improvement requirement. [EPA-HQ-OAR-2010-0799-8084-A1, p. 3]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 40-41.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 35-36.]

Organization: National Association of Manufacturers (NAM)

The NAM submits these comments to address one specific substantive aspect of the proposed rule: the mid-term evaluation program. As described below, the NAM supports the inclusion of a mid-term evaluation cycle but has a number of concerns regarding the content of the review and the procedures through which it will be implemented. We urge the EPA to clarify the content of the evaluation and the procedural details of the evaluation and to add additional time to the review process so that the EPA can complete a revised rulemaking with sufficient lead time to allow regulated entities to achieve compliance. [EPA-HQ-OAR-2010-0799-9538-A2, p. 1]

The Agencies Should Adhere to the Mid-Term Evaluation Process to Ensure That Regulated Entities Are Not Subject to Inappropriate Standards

The Associations fully support the Agencies' proposal to complete a mid-term evaluation of the appropriateness of the Model Year 2022-2025 standards. Estimates and projections of future costs and the pace of technological development made more than 10 years in advance are fraught with uncertainty and the risk of significant deviation from those projections is high. Therefore, a mid-term evaluation is appropriate so that the Agencies can make necessary adjustments to the standards to ensure the standards are cost-effective and capable of implementation. The Associations generally agree with the proposed content of the mid-term evaluation, particularly its focus on the cost and availability of advanced technologies, the standards' impact on vehicle safety, the effect on the economic health of the automotive industry, and "other relevant factors." While the Agencies need not develop an exhaustive list of relevant factors in advance, they should include those factors that will necessarily impact the automotive industry's ability to achieve the standards. For example, the Agencies should expressly require consideration of consumer purchasing patterns and acceptance of new technologies, the availability of alternative fuel infrastructure, and government responses to declining gasoline tax revenue as a result of increased fuel efficiency. [EPA-HQ-OAR-2010-0799-9538-A2, p. 2]

The Associations also have a number of procedural concerns about how the mid-term evaluation and subsequent rulemaking will be conducted. First, the proposed timeline for the review and promulgation of new standards is compressed and delays in the review process may threaten the industry's ability to comply with revised standards once they are issued. The proposed rule requires the Agencies to make a final determination regarding the appropriateness of the existing standards a mere 4.5 months after issuing the draft Technical Assessment Report. In this short time period, the Agencies propose to complete a peer assessment of the draft report, solicit public comments on the draft report and the appropriateness of the existing standards, and respond to the peer assessment and public comments. The peer and public review are critical components of the mid-term evaluation and the Agencies must ensure that the comment process and their response are not rushed. If the Agencies find that the existing standards are inappropriate, they will have little more than two years to promulgate revised standards, leaving manufacturers with only 18 months to achieve compliance with the revised standards. While the schedule proposed by the Agencies will provide sufficient lead time to allow manufacturers to adjust to the revised standards, history has shown that rulemaking deadlines are often missed, meaning that manufacturers could be left with even less time to comply with the revised standards. As a result, we urge the Agencies to consider additional mechanisms to ensure that revised standards will be issued on schedule. For example, the Agencies could provide additional flexibility by beginning the review process earlier. To ensure the effectiveness of the review process, the Agencies should clarify and make judicially enforceable the proposed timeline and details of the public and peer reviews of the draft Technical Assessment Report. We also urge the Agencies to set a firm and judicially enforceable timeline (including a commencement date and intermediate milestones) for the development of the draft report to ensure that it is completed on schedule. With the addition of these procedural safeguards, we are confident that the Agencies will be able to complete the mid-term evaluation and subsequent rulemaking while adhering to the proposed timeline. [EPA-HQ-OAR-2010-0799-9538-A2, pp. 2-3]

Second, the Agencies should not take the default position that the existing 2022-2025 model year standards will remain in place unless changed by rulemaking. If the Agencies determine that the 2022-2025 standards are inappropriate, there is simply no reason to leave them in place during the subsequent rulemaking process. Instead the existing standards should be rescinded immediately upon a determination that they are inappropriate, leaving the 2021 standards in effect until revised standards are finalized. Otherwise, manufacturers would be required to comply with the inappropriate standards in the event that a subsequent rulemaking is not finalized by 2022. As noted above, there is always a risk that agencies will be unable to meet proposed timelines for review processes and rulemaking proceedings. Moreover, as EPA and NHTSA recognize, both the appropriateness determination and any subsequent rulemaking would be final agency action subject to judicial review. The proposed rule does not include an expedited review procedure and a challenge to either final agency action would add additional delay and threaten the Agencies' ability to complete a final rulemaking before 2022. In light of these risks, it would be arbitrary and capricious to leave the 2022-2025 standards in effect after they are determined to be inappropriate. [EPA-HQ-OAR-2010-0799-9538-A2, p. 3]

Organization: National Automobile Dealers Association (NADA)

The proposal contains a so-called 'mid-term evaluation' designed to allow for the reevaluation of the key regulatory assumptions. It defies logic that the proposal sets up the need for a 'mid-term evaluation' in the first place. In fact, NHTSA and EPA should not even be engaged in rulemaking at this time, so soon after having set standards for MYs 2012-2016, and before having had the benefit of learning from how those standards work in the real world. A prudent strategy would involve engaging in rulemaking in the calendar year 2014 time frame, aimed at setting standards for MYs 2017 through 2021 or 2022. Such a timetable would greatly reduce the likelihood that mandates will prove to be technologically infeasible or economically impractical. As evidenced by the truck emissions experience, NHTSA and EPA should strive to limit any risk of foreseeable harms and unforeseeable consequences. [EPA-HQ-OAR-2010-0799-9575-A1, p. 12]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 70.]

Sure, manufacturers need adequate time to achieve compliance. And as a businessman, dealers appreciate regulatory certainty, but we question whether setting fuel economy mandates so far out makes sense when critical variables like fuel prices, consumer behavior and creditworthiness are paramount. If anything, this contradicts Congress's intent that such standards be set in 5-year or fewer intervals. Moreover, any supposed certainty may be fleeting given the proposal's mid-term review could result in even stricter mandates for model years 2022 to 2025.

Organization: Natural Resources Defense Council (NRDC)

D. Mid-Term Evaluation Is Unnecessary but, If Used, Proposed Structure Is Appropriate

NRDC believes that the mid-term evaluation is unnecessary and potentially disruptive to automaker product planning. The mid-term review adds uncertainty to what is otherwise a nine-year planning horizon for the automakers. By cutting the planning time line roughly in half, the mid-term evaluation undermines investments in technology that will improve efficiency beyond 2021 required levels. The mid-term review could also disrupt the deployment of vehicle fueling infrastructure, for advanced vehicles such as plug-in electric vehicles and hydrogen fuel cell vehicles that may be on the verge of a rapid market growth in the post-2020 period. [EPA-HQ-OAR-2010-0799-9472-A2, p. 16]

As it is proposed, the mid-term evaluation follows an appropriate structure. There should be only a single mid-term evaluation to consider compliance with standards for just model years 2022 to 2025. The mid-term evaluation should consider the wide-range of factors that affect the automotive industry's ability to comply, including different technology pathways, credit mechanisms such as banking, trading and borrowing and market conditions. However, a decision to modify the standards should be based on weighing all factors and not mainly on a single factor, technology or market projection. [EPA-HQ-OAR-2010-0799-9472-A2, p. 16]

NRDC agrees that mid-term evaluation should occur as close as possible to the beginning of model year (MY) 2022 without violating the minimum 18 month leadtime. The close timing will ensure that recent advances in technology driven by the MY 2017-2021 standards will be considered in the evaluation. [EPA-HQ-OAR-2010-0799-9472-A2, p. 17]

We agree that an assessment of compliance and the development of a technical assessment report for the mid-term review should include the close coordination of all three regulatory agencies that have developed the National Program since 2009, including EPA, NHTSA and CARB. The evaluation should also be open for public participation and comment consistent with this proposed rule. [EPA-HQ-OAR-2010-0799-9472-A2, p. 17]

Organization: Nissan North America, Inc.

Mid-Term Review: Nissan's commitment to the program Is premised on a comprehensive mid-term evaluation for MYs 2022-2025. The standards are extremely aggressive, particularly with regard to the light truck fleet. The standards assume not only a significant amount of technology advancement, but also consumer acceptance and transformation of the vehicle fleet. For both the light truck and the passenger car fleets, the extent to which automobile manufacturers are able to meet these standards will depend not merely on their ability to cost-effectively incorporate additional and transformational technologies, but also on factors external to vehicle design and engineering. The mid-term evaluation is essential to ensuring that the standards remain technologically and economically feasible. A meaningful review, as set forth in the Notices of Intent and the proposal, to evaluate the full range of market, technology and regulatory factors for the later model years is not only essential, it is required by law. [EPA-HQ-OAR-2010-0799-9471-A1, p.2]

The Mid-Term Review is Essential to Ensure that the Assumptions Underlying the Proposal are Valid for the Later Model Years

The proposed standards are extremely ambitious. Success in meeting these standards will depend not only on the deployment of advanced technologies and materials, but also on consumer demand shifts and the economic vitality of the U.S. market. The technological and economic uncertainties inherent in setting standards so far into the future make a robust mid-term review an essential element of the program. Only through a commitment to a comprehensive mid-term evaluation will the government, industry and stakeholders have certainty that the goals established for MYs 2022-2025 remain appropriate and feasible. [EPA-HQ-OAR-2010-0799-9471-A1, pp.4-5]

Nissan will continue to provide a full range of vehicles, and to incorporate continuous improvements throughout its vehicle fleets. This includes advances in internal combustion engines (ICEs) as well as the continued deployment of electric drivetrains. Nissan also continues to explore appropriate opportunities for mass reduction. A comprehensive mid-term evaluation is critical to determining the extent to which the market accepts the additional costs associated with more advanced internal combustion vehicles, as well as the extent to which the advanced powertrain market develops. In addition, government regulatory programs involving both fuels and safety requirements will directly affect future feasibility and must be considered in any future review. [EPA-HQ-OAR-2010-0799-9471-A1, p.5]

Without a robust mid-term evaluation, manufacturers may face standards that have become infeasible in light of market movements or economic conditions beyond their control. Investment decisions will be focused on short term compliance rather than longer term technology advancements. The absence of a mid-term evaluation would subvert the framework embedded into the National Program and would create the uncertainty the agencies are trying to overcome by providing a starting point for regulatory review covering model years into the future. [EPA-HQ-OAR-2010-0799-9471-A1, p.5]

A comprehensive mid-term review is also necessary to review the extent to which the industry is able to meet the aggressive light truck standards set forth for MYs 2022-2025. Nissan anticipates that the level of improvement established for that vehicle segment will be extremely challenging, particularly for companies selling more limited volumes in those market segments or if companies curtail their offerings in the light truck fleet. The costs associated with the technologies necessary to meet the standards while still providing requisite consumer utility may render the light truck standards established for the later model years infeasible and require adjustment. [EPA-HQ-OAR-2010-0799-9471-A1, p.5]

Nor is it feasible to rely on credits generated in the car fleet to cover deficits in the truck fleet. While the GHG program properly allows for full credit transfers between the car and truck fleet, the ability to generate credits in the car fleet to cover the more challenging requirements in the truck fleet are statutorily limited in the CAFE program. It is imperative for the agencies to engage in a meaningful mid-term evaluation to ensure that the standards remain feasible for companies servicing this market with smaller volume light truck fleets. [EPA-HQ-OAR-2010-0799-9471-A1, pp. 8-9]

Both the Clean Air Act and the Energy Policy & Conservation Act require that the agencies make a determination that the standards can be met through cost-effective technologies. While NHTSA, subject to the five year limitation, will not yet formally adopt final regulations, consistent with the National Program the standards formally established by EPA will effectively be adopted later and applied to the CAFE program as well. A robust mid-term review is necessary to ensure that the standards remain consistent with the statutory underpinnings of both programs. [EPA-HQ-OAR-2010-0799-9471-A1, p. 9]

Accordingly, a robust and comprehensive mid-term review is legally necessary to ensure that the standards for the later model years are supported by substantial evidence and are not arbitrary and capricious. See Motor Vehicle Mfr's Ass'n v. State Farm, 463 U.S. 29, 42 (1983) (listing examples of arbitrary and capricious agency activity); Association of Data Processing Services Organization v. Board of Governors of the Federal Reserve System 745 F.2d 677, 683-84 (D.C. Cir. 1984). [EPA-HQ-OAR-2010-0799-9471-A1, p. 9]

Section 202(a)(2) of the CAA requires that standards promulgated under the Act 'shall take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.' 42 U.S.C. § 7521(a). Similarly, EPCA requires that CAFE standards be established at the 'maximum feasible' level taking into account, among other things, 'technological feasibility' and 'economic practicability.' 49 U.S.C. § 32902(f). [EPA-HQ-OAR-2010-0799-9471-A1, p.9]

The proposed standards assume a significant amount of market transformation, both within the ICE fleet and with regard to the penetration of new powertrains in order to be able to meet the levels established for the later model years. Unlike the situation in which the agencies establish aggressive requirements with long-lead times to allow technology and market development, the standards for MYs 2022-2025 follow a decade of increasingly stringent requirements already demanding substantial technological deployment and market penetration. This layering of new requirements renders it virtually impossible for the agencies to be able to determine with the requisite level of regulatory certainty that cost-effective, economically-practicable technology can be deployed into the fleet and enable compliance with these standards. [EPA-HQ-OAR-2010-0799-9471-A1, p.9]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 127-128.]

Nissan's commitment to the proposed rule is premised on a robust and comprehensive mid-term evaluation for the model years 2022 to 2025. The standards are extremely aggressive and extend beyond current development planning periods. The agencies have assumed a significant amount of technology advancement, consumer acceptance, and fleet shift during these model years covered.

The ability of auto manufacturers to meet these standards will depend not only on our commitment to incorporate additional and transformational technologies but also on factors external to vehicle design and engineering. The mid-term evaluation is essential to ensuring that the standards remain technologically and economically feasible during those time periods.

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

EPA should continue to evaluate the GHG effects of these technology incentives to ensure preservation of the overall goals of the program. We also expect that EPA will monitor upstream emissions from the power grid to ascertain whether the improvements assumed to occur do in fact occur. In that regard, we strongly support the proposed mid-term review that will provide the opportunity to consider appropriate revisions to these incentives and to other aspects of the program. [This comment can also be found in section 4 of this comment summary.] [EPA-HQ-OAR-2010-0799-9476-A1, p. 2]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 74.]

Organization: Pew Charitable Trusts

While the proposed requirements set forth by EPA and DOT are aggressive and laudable, Pew strongly urges the agencies not to allow the final standards to be weakened during the midterm review period. Pew understands that fuel efficiency standards produced by DOT are limited by statute to five year increments, and also appreciates the value of technological and cost review to ensure that standards are achievable. However, we believe that federal fuel efficiency standards must remain strong in order to enhance American manufacturing competitiveness in the auto industry while protecting consumers and businesses from fuel cost volatility. [EPA-HQ-OAR-2010-0799-9496-A2, p. 2]

Organization: Porsche Cars North America, Inc. (PCNA)

Midterm Evaluation [EPA-HQ-OAR-2010-0799-9264-A1, p. 4]

Porsche strongly supports the proposed mid-term evaluation which will allow the Agencies to determine whether adjustment of fuel economy and GHG standards is warranted. The success of the program depends on customer acceptance, developments in technology, costs, safety, fuels, necessary infrastructure, and other relevant factors. Assumptions that informed the program model include significant uncertainties due to the length of time over which the standards apply. It is critical to evaluate whether those assumptions are still valid, and therefore whether the standards remain appropriate in light of technological and other changes that may have occurred since the initial setting of the standards. [EPA-HQ-OAR-2010-0799-9264-A1, p. 5]

In making this comment, we wish to stress that Porsche does not assume that EPA or NHTSA intend to deviate from the mid-term evaluation process or ignore its deadlines. We believe that all parties, including the Agencies, will work in good faith to follow the process, and will perform a serious assessment of the state of the program. But we wish to stress that the success of the mid-term evaluation depends on strict adherence to commitments and deadlines. Such adherence is essential in order to mitigate a significant potential for disputes and difficulties in the future. [EPA-HQ-OAR-2010-0799-9264-A1, p. 5]

Organization: RVIA

Therefore, we support the proposed mid-term review and we recommend that the agencies use the time leading up to the mid-term review to talk to consumers to better gauge what impact the increased costs will have on their new vehicle purchase decisions if prices are increased by the amounts projected by EPA and NHTSA. [EPA-HQ-OAR-2010-0799-9550-A2, p.2]

With regard to full size pickups, EPA and NHTSA should utilize the time leading up to the mid-term review to talk to consumers to better gauge what impact the increased costs will have on their new vehicle purchase decisions if prices are increased by the amounts projected by EPA and NHTSA for the 2022-2025 model year timeframe. [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

Organization: Securing America's Future Energy (SAFE)

Midstream Review: The agencies have proposed standards that extend relatively far into the future. In contrast to the last round of regulations issued in 2011 that will affect cars that will enter the market within five years, these regulations will affect some cars that will not be manufactured for thirteen years. (Thirteen years ago, traditional hybrids were not yet on the market in the United States.) [EPA-HQ-OAR-2010-0799-9518-A1, p. 11]

The thirteen years over which these regulations will remain in effect will be a period of great uncertainty with respect to at least two factors that will have a substantial effect on the cost-effectiveness of more efficient vehicles, particularly if traditional hybrids, PHEVs or EVs are needed to meet the new standards: battery prices and oil prices. [EPA-HQ-OAR-2010-0799-9518-A1, p. 11]

It appears likely that automakers will have to rely on traditional hybrids, and to a lesser degree PHEVs and EVs, in order to meet the new standards. Throughout the period over which the standards will be tightening, the cost of these vehicles, and their overall cost-effectiveness, will remain a function of the price of large-format automotive grade batteries. In an area of such rapidly evolving technology, however, it is difficult to forecast with any degree of certainty what battery prices might look like in 2020, not to mention 2025. Higher battery prices will make it harder to meet the standards, just as lower battery prices will make it easier, perhaps supporting even tighter standards. [EPA-HQ-OAR-2010-0799-9518-A1, p. 11]

While battery prices are difficult to predict eight to thirteen years into the future, oil prices are difficult to predict even months in the future. As we prepare these comments, oil is selling for about $100 per barrel. But prices have been as high as $114 and as low as $34 over the past 36 months, and as low as $11.37 and as high as $145 over the past 13 years. Stated simply, given the uncertainty over oil prices of the time during which these rules will be in effect, and the consequences of oil prices for the cost-effectiveness of these rules, it is incumbent on the regulating agencies to carefully reevaluate the cost effectiveness of the standards in light of current oil prices and trends, and tighten or loosen the standards as appropriate at the midstream review. [EPA-HQ-OAR-2010-0799-9518-A1, p. 11]

Of equal importance is the possibility that technological innovation over the next several years will substantially alter the cost-effectiveness of increasing fuel efficiency or reducing oil consumption. For instance, the 2002 National Academies of Science study on fuel economy did not even mention plug-in hybrid technology, despite a detailed discussion of traditional hybrid technology, yet plug-in hybrids were on the road just eight years later. One can imagine that a newly developed battery chemistry, for instance, might substantially alter the cost-effectiveness of the regulations, allowing for an adjustment of the standards. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 11-12]

Not only do these regulations extend far into the future, and not only is there substantial uncertainty with respect to their cost-effectiveness, the regulations would require percentage increases in fuel economy that exceed previous increases, and may be more difficult to achieve as the lowest cost improvements in efficiency have already been made. We appreciate that the accelerated adoption of new technology may allow automakers to meet the proposed standards without any interruption in their product cycles, while delivering vehicles that consumers will purchase and enjoy. However, we also recognize that this question is fundamentally one of consumer acceptance that can be answered only once new more efficient vehicles are put into automobile retailers' showrooms. A midstream review will enable the agencies to examine the consumers' acceptance of new vehicles and adjust the standards upwards or downwards if and as appropriate. [EPA-HQ-OAR-2010-0799-9518-A1, p. 12]

Given the substantial uncertainty regarding the cost of batteries and oil, SAFE believes, that the midstream review should be a comprehensive review into which the agencies enter with an open mind. In support of that process, the agencies should prepare a new or updated technical support document and regulatory impact analysis. It should then affirm or adjust (upwards or downwards as appropriate) the standards based on the results of the analyses. [EPA-HQ-OAR-2010-0799-9518-A1, p. 12]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 152.]

Finally, I can't stress enough, as others have already said, the importance of a real midstream review. The fuel economy regulations have never been issued so far in advance and asked so much of automakers. We don't know where oil prices are going to be. We don't know where battery prices are going to be. And these are critical factors in trying to see what can happen. And just like it's possible that the rules may not prove cost-effective, it's possible that we may find that tightening is also inappropriate. So we stress the importance of having a real review.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Remain strong throughout the program and not end with the midterm review and a backstop should be considered: Our transportation system drives our addiction to oil with cars and light trucks alone consuming more than 8 million barrels of oil every day. This addiction to oil spews out nearly 20% of US climate disrupting pollution. The proposed standards for 2017-2025 vehicles can help Americans avoid using as much as 1.5 million barrels of oil every day in 2030 and cut carbon emissions in that year by 280 million metric tons. A consumer who buys an average new vehicle in 2025 would keep more than $4,000 in their pocket rather than spending it on oil – even after paying for fuel savings technologies. [EPA-HQ-OAR-2010-0799-9549-A2, p. 4]

But to deliver these benefits the program must remain strong through 2025. The program as proposed includes a mid-term review that begins in 2017. While EPA's authority under the Clean Air Act permits it to propose and finalize a program for the full nine model years, NHTSA's authority is constrained. This factor among others created pressure for the mid-term review which appropriately will involve all three standard setting agencies: EPA, NHTSA and CARB. [EPA-HQ-OAR-2010-0799-9549-A2, pp. 4-5]

Automakers have suggested additional reviews in testimony at the public hearings the agencies held in January. We strongly urge that the final rule not open up additional reviews of the standards. As it stands, the mid-term review will occur just as this rule is taking affect and would therefore be based up on the successful implementation of the 2012-16 program. The agencies should ensure transparency and access to data that will allow the public to effectively and timely monitor compliance, trends and technology application. [EPA-HQ-OAR-2010-0799-9549-A2, p. 5]

In particular, the agencies should provide the public with data, including the following:

Credit use, current balance, and method of credit generation by manufacturer,

Technology penetration, both overall and by manufacturer

Sales by vehicle footprint

Car/truck mix, both overall and by manufacturer [EPA-HQ-OAR-2010-0799-9549-A2, p. 5]

We appreciate that the proposed rule as structured offers the opportunity for a full assessment of progress and technology development but it is necessary for mid-term review to be a check on progress and an opportunity to strengthen standards and not become and off-ramp or stop sign. [EPA-HQ-OAR-2010-0799-9549-A2, p. 5]

Organization: Toyota Motor North America

Also groundbreaking is the scope of the proposed regulations, covering cars and trucks the industry will be designing, manufacturing and selling up to 13 years in the future. The agencies have made a variety of assumptions underlying the proposed standards that may or may not prove accurate. These assumptions include the efficacy and pace of cost reduction for certain technologies, as well as consumers' willingness to pay for them. For this reason, Toyota fully supports timely completion of the proposed mid-term review to assess our progress toward these goals. [EPA-HQ-OAR-2010-0799-9586-A1, p.2]

Mid-term Review [EPA-HQ-OAR-2010-0799-9586-A1, p.7]

In proposing standards through 2025 model year, the agencies have made assumptions about numerous key factors including technology cost, technology performance, fuel prices, manufacturing efficiency, consumer adoption, and other factors that represent their best estimates of the future based on information available in 2012. The agencies acknowledge the significant uncertainty in many of these assumptions, and have proposed a mid-term evaluation of the 2022-2025 model year standards to determine whether those standards remain appropriate in light of changes that may have occurred since the time of proposal.[1] Toyota supports the mid-term review but, as discussed below, we request clarifications and additional details as to how the review will be administered. [EPA-HQ-OAR-2010-0799-9586-A1, p.7]

Key Factors/Assumptions [EPA-HQ-OAR-2010-0799-9586-A1, p.7]

The agencies proposed eight high-level areas of examination for the mid-term review and the preamble discusses additional factors to be evaluated. The Alliance of Automobile Manufacturers (Alliance) has submitted comments addressing the proposal, including a recommendation to expand the factors that should be included in the mid-term review. Toyota supports the Alliance comments in this area. Beyond the Alliance comments, the agencies should consider two additional issues in the mid-term review. [EPA-HQ-OAR-2010-0799-9586-A1, p.7]

First, the agencies must ensure that the proper baseline is used when determining the feasibility of the 2022-2025 model year standards. This issue is best explained with a simple example. Suppose the industry 'compliance level' at the time of the mid-term review (~2018 model year) is 38 mpg in CAFE space and the agencies determine that cost-effective technology exists to support a 4 percent annual improvement rate. A logical conclusion would be that 50 mpg (in CAFE space) is an appropriate standard for 2025 model year (a 4 percent annual compounded increase applied to 38 mpg for seven years). However, if industry has relied on credits to achieve the 38 mpg level, a 50 mpg target would effectively be higher than a 4 percent annual increase. In fact, if the industry relied on credits for just 2 mpg of compliance (resulting in a true technology baseline of 36 mpg), the annual improvement rate would be nearly 5 percent per year - or 25 percent higher than using the 38 mpg baseline. NHTSA is precluded by law from considering the availability of credits in establishing maximum feasible CAFE standards. Under current law, NHTSA will also be precluded from considering the availability of credits when it establishes 2022-2025 model year standards based on the mid-term review. While the CAA does not appear to specifically limit EPA's authority in this regard, the shared goal of harmonization would dictate EPA similarly not consider the availability of credits when determining the appropriateness of the 2022-2025 model year standards during the mid-term review. [EPA-HQ-OAR-2010-0799-9586-A1, p.7]

Second, in the course of the mid-term review the agencies should continue EPA's longstanding practice of treating vehicles and fuels as a system. While the proposed standards are based on currently available fuels, higher octane and/or reduced sulfur can enable additional greenhouse reductions and fuel economy improvements from several technologies. For example~ lower sulfur gasoline would allow the use of stratified lean-burn engines. Increasing octane in gasoline would enable engines to operate at higher compression ratios, and support technology approaches such as heavily boosted, downsized engines. Manufacturers may find these options increasingly necessary in the 2022 - 2025 model year time frame, and for that reason the role of fuels and fuel specifications should be included as part of the mid-term review. [EPA-HQ-OAR-2010-0799-9586-A1, p.8]

Process Details and Schedule [EPA-HQ-OAR-2010-0799-9586-A1, p.8]

The proposed regulation requires a Draft Technical Assessment Report to be completed by November 2017, and a final determination as to whether the 2022-2025 standards remain appropriate to be peer-reviewed and made available for public comment by April 1,2018. If the EPA determines the standards are not appropriate as promulgated in this rulemaking, EPA stated its intention in the preamble to establish by rulemaking new standards that are appropriate under section 202(a) of the CAA. In any case, NHTSA must formally promulgate standards for 2022-2025 model years by April 1, 2020. [EPA-HQ-OAR-2010-0799-9586-A1, p.8]

Toyota understands that soon after promulgating the 2017-2025 model year standards in this rulemaking, the agencies intend to begin an ongoing dialogue with the auto manufacturers, suppliers~ and other stakeholders about progress toward meeting the joint national standards. Toyota supports this type of information sharing because it will provide the agencies the most accurate sense of technology advancements, consumer preferences, and economic conditions as circumstances evolve. The information derived from this dialogue can serve as building blocks toward the mid-term review and afford the agencies and auto manufacturers timely course adjustments for items within their control. Toyota believes it would be helpful for the agencies to outline this process in as much detail as possible in the preamble to final rule. [EPA-HQ-OAR-2010-0799-9586-A1, p.8]

2022-2025 Model Year Default Standards [EPA-HQ-OAR-2010-0799-9586-A1, p.8]

Toyota appreciates the agencies' commitment to a mid-term review and EPA's stated intention to finalize any changes in its 2022-2025 model year GHG standards at least 18months prior to the beginning of the 2022 model year [2] (e.g. by April 1, 2020). Notwithstanding the good intentions of all parties involved to support timely completion of the mid-term review and timely rulemaking as needed, Toyota is concerned about what happens if the agency does not take a final agency action by April 1, 2020 to either validate the standards as originally promulgated or to revise the standards. As proposed by EPA, the 2022-2025 model year GHG standards would remain in effect unless and until EPA changes them by rulemaking. [EPA-HQ-OAR-2010-0799-9586-A1, p.8]

However, if EPA misses its self-imposed deadline for final agency action, it will not have met the requirement of Section 202(a)(2) of the CAA to provide adequate lead time for development of requisite technology for meeting emission standards. Further, given that EPA and NHTSA plan to work collaboratively on the mid-term review (with ARB) and to utilize the results to jointly assess the 2022-2025 model year standards, failure by EPA to take final agency action would likely indicate that NHTSA lacks sufficient information to promulgate its standards for 2022-2025 model year in a timely manner. In such a case, there would be no new NHTSA standards for 2022 model year, and NHTSA would presumably be forced to adopt the 2021 model year standards for 2022 model year. It is unclear what standards ARB would pursue for 2022 model year in this case. This would result in major differences between the EPA and NHTSA standards, and potentially different standards for ARB and Section 177 states, and would run completely contrary to the objective of a harmonized national program. [EPA-HQ-OAR-2010-0799-9586-A1, p.9]

For the reasons described above, Toyota requests that, in the event EPA does not take final agency action concerning the 2022-2025 model year standards by April 1, 2020, the 2021 model year GHG standards remain as the 'default' standards until such time as EPA does take final agency action providing at least 18-months of lead time prior to the applicable mode year. [EPA-HQ-OAR-2010-0799-9586-A1, p.9]

California Air Resources Board Participation [EPA-HQ-OAR-2010-0799-9586-A1, p.9]

Toyota fully agrees that ARB, as a signatory to the national program for GHG emissions and fuel economy standards, will be an important partner in the mid-term review process. We support the agencies' intention to coordinate the mid-term review with ARB and condition a waiver for their 2017-2025 model year standards on ARB accepting any adjustment to the EPA 2022-2025 model year GHG standards that result from the midterm review. [EPA-HQ-OAR-2010-0799-9586-A1, p.9]

---

1 - NHTSA's statutory authority prevents it from formally promulgating standards beyond 5-model years. Toyota's comments on the mid-term review generally refer the 'review' of the proposed EPA GHG standards, and to NHTSA's participation in, and use of, the mid-term review results as a basis for formally establishing for 2022-2025 model year CAFE standards. [EPA-HQ-OAR-2010-0799-9586-A1, p.7]

2 - NHTSA is required by law to finalize CAFE standards at least IS-months prior to the start of the model year. [EPA-HQ-OAR-2010-0799-9586-A1, p.8]

Organization: U.S. Chamber of Commerce

The Chamber supports reducing emissions from automobile tailpipes, and supports greater vehicle fuel economy when needed to address consumer demand. The Chamber is pleased that the automobile industry is receiving the regulatory certainty it needs for long-term planning purposes. However, given the costs the regulations will require to be built into all new vehicles to achieve these goals, a strong 2018 midterm review will be essential. [EPA-HQ-OAR-2010-0799-9521-A1, p. 1]

I. The 2018 Mid-Year Review Must Be Strong, Thorough and Realistic

The National Program for fuel economy proposed by EPA and NHTSA is very aggressive, and will test the limits of the automobile industry’s technological prowess. This is particularly evident in the last four years of the program (2021-2025), when the rate of increase in light truck fuel economy standards increases dramatically, from 3.5 percent per year to 5 percent per year. This portion of the proposal reaches so far into the future that EPA, NHTSA and automakers truly have no certainty as to how technologies will develop and what they will cost. However, at this early juncture, EPA seems to admit that they will cost the bulk of consumers more money. [EPA-HQ-OAR-2010-0799-9521-A1, p. 2]

Fuel economy matters to consumers, but car buyers historically have not valued fuel economy as highly as other key attributes such as affordability, safety, convenience and utility. A car buyer's perspective on fuel economy also fluctuates with fuel prices, which are very difficult to predict long-term. There is therefore a very real possibility that, for one or more reasons, consumers will not want to buy some of the new fuel-efficient vehicles that will have to be brought to market to comply with the 2017-25 rule. [EPA-HQ-OAR-2010-0799-9521-A1, p. 2]

Moreover, conditions beyond the control of automobile manufacturers will greatly affect automakers' ability to achieve aggressive new fuel economy standards. Gasoline prices are virtually impossible to predict long-term. Availability of critical minerals has already become an important issue to the automobile industry. The state of the economy certainly has an impact on consumers' car buying habits. And infrastructure for many of the new technologies being incentivized by the 2025 standards—such as electric vehicles, fuel cells and alternative fuels—must actually be built. [EPA-HQ-OAR-2010-0799-9521-A1, pp. 2-3]

It is therefore of utmost importance that any final rule include a rigorous midterm review in 2018, with a clearly defined process for conducting the review. If mainstream consumers are not buying the newer, fuel-efficient vehicles or are not likely to buy the significantly more efficient (and expensive) vehicles slated for the 2021-25 time frame, then the agencies must be able to change the rule.2 If conditions change that are outside the control of the automobile industry, Federal regulators must be willing and able to take a pragmatic view of the 2021-2025 time frame and revise the rule accordingly. [EPA-HQ-OAR-2010-0799-9521-A1, p. 3]

---

2 And if the agencies wish to change the rule downward, they should not be bound to the will of California, which has shown time and again that its fuel economy goals do not represent the national interest.

Organization: Union of Concerned Scientists (UCS)

(d) Mid-Term Evaluation

A great deal of attention to this proposal has been focused on the mid-term evaluation provision, and with good reason. Structured properly, it can provide assurance that the nine-year rulemaking is both equitable and based on the latest research. Structured improperly, however, it can create regulatory uncertainty, disturb the industry's product planning efforts, and impede technological development by undercutting industry investments in technologies slated to serve the post-MY2021 vehicle fleet. [EPA-HQ-OAR-2010-0799-9567-A2, p. 10]

According to UCS analysis, nearly 40 percent of the MY2017-2025 Program's 2030 oil savings and emissions reductions benefits would be lost if the mid-term evaluation foreclosed subsequent improvements to vehicle efficiency and GHG emissions reductions post-MY2021. Given what is at stake, it is imperative that the agencies structure the mid-term evaluation to ensure that the provision is used to support stronger standards moving forward, and not as an opportunity by the industry to stall or forego regulatory obligations. [EPA-HQ-OAR-2010-0799-9567-A2, p. 10]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 218.]

For example, the proposal's midterm evaluation provision must be structured to ensure that it is used to support strong standards moving forward, and not merely as an opportunity by the industry to stall or forego regulatory obligations.

Automobile manufacturers have publicly stressed the importance of tracking progress leading up to the mid-term evaluation. As UCS has stated in the past, the mid-term evaluation should occur only one time, and it should be conducted as closely to the first year in question (MY2022) as legally permitted, to most accurately capture the status of technology and the vehicle market for the model years in review. While EPA and NHTSA should remain up to date on technology developments, regularly scheduled “progress reports” between now and 2018, as suggested by some in industry, would be both time consuming and too premature to judge technology readiness of the Model Year 2022-2025 standards. Premature reports would increase speculation within the industry about “prevailing winds” of the mid-term evaluation, create unnecessary uncertainty, and undermine the intent and effectiveness of the provision itself.

That being said, UCS strongly supports the agencies continuing their work – for instance, the impressive teardown cost analysis conducted by EPA, and other assessments documented in the Joint Technical Support Document – during the next five years in order to feed those analyses into the formal mid-term evaluation. [EPA-HQ-OAR-2010-0799-9567-A2, p. 10]

When the mid-term evaluation is conducted to assess possible modification (up or down) of the 2022-2025 standards, it is critical that the entire suite of factors affecting manufacturers’ ability to comply be considered in their totality. UCS agrees that “a holistic assessment of all of the factors…without placing decisive weight on any particular factor or projection” is the correct approach in conducting the mid-term evaluation. Basing latter year feasibility on an isolated set of factors would be turning a blind eye to the reality that the industry has multiple options at its disposal in meeting the standards. [EPA-HQ-OAR-2010-0799-9567-A2, p. 10]

Finally, UCS agrees with the agencies that the mid-term evaluation be a closely coordinated process, conducted jointly by EPA, NHTSA, and CARB; that the evaluation be open to public participation; and that the agencies seek, consider and respond to public comment on its determination prior to invoking any final actions. [EPA-HQ-OAR-2010-0799-9567-A2, p. 10]

Though I strongly support these standards, I am concerned about possible loopholes that automakers could exploit. Specifically: The agencies are proposing a 'mid-term' review that would begin soon after the standards come into effect. In the past, automakers have abused similar programs-turning them into off-ramps as opposed to reviews. It is critical that this review does not undermine the program through 2025. [EPA-HQ-OAR-2010-0799-9713-A2, p. 2]

Organization: United Automobile Workers (UAW)

Finally, the UAW is pleased that EPA is proposing a mid-term review for the proposed standards for model years 2022–2025, and that NHTSA will perform a full rule making procedure for those years as required under its statutory authority to regulate fuel economy. Given the quickening pace of technical innovation and cost reductions in the auto industry, the UAW believes that it is wise to continue to evaluate the cost and effectiveness of fuel-saving technologies well in advance of the formal mid-term review. [EPA-HQ-OAR-2010-0799-9563-A2, p.4]

The mid-term review is a critical structural feature of the proposed unified national program, and a central reason the UAW can be so strongly supportive of the proposals by EPA and NHTSA. The UAW believes that the mid-term review should be conducted with the same type of broad stakeholder engagement and public participation that occurred in the development and presentation of the proposed regulations for 2017–2025. The proposed standards are stronger and more achievable because of this process, and they stand as a testament to how we can work together to address real issues of national importance. [EPA-HQ-OAR-2010-0799-9563-A2, p.4]

Organization: United States Senate

In addition, the 'mid-term' review for the model year 2022-2025 standards will require your agencies to evaluate whether the stringency required in the second phase of the program is still appropriate or whether the standards should be revised upwards or downwards. [NHTSA-2010-0131-0264-A1, p.1]

Organization: University of Michigan

A Call to EPA and NHTSA to Consider the Consumer Fuel Usage Reduction Options in the Mid-term Evaluation of the Greenhouse-Gas Emission and Corporate Average Fuel Economy Standards for Light-Duty Vehicles. [EPA-HQ-OAR-2010-0799-7986-A1, p. 1] [This comment can also be found in section 12 of this comment summary.]

As both the EPA and NHTSA will be undertaking the midterm evaluation of the GHG emission and the corporate average fuel economy standard for model year 2022-2025 vehicles in due course, we recommend that meaningful incentives for consumer fuel usage reduction be taken into consideration. [EPA-HQ-OAR-2010-0799-7986-A1, p. 2] [This comment can also be found in section 11 of Docket number EPA-HQ-OAR-2010-0799-7986-A1]

Organization: Volvo Car Corporation (VCC)

VCC is sympathetic to the numerous environmental challenges that impact the agencies in trying to reach their varied goals. However, it is of utmost importance that all agencies, as far as possible, collaborate to achieve common understandings, wherever possible. [EPA-HQ-OAR-2010-0799-9551-A2, p. 3]

VCC supports a mid-term evaluation. Amid-term evaluation will allow manufacturers and the agencies to consider whether the regulation is reasonable and on track in its assumptions. VCC supports a mid-term evaluation because it is very difficult to predict fifteen years into the future without making a vast number of assumptions. Customer acceptance, affordability (especially in light of the phase-out of many of the federal and state incentives), safety, convenience and utility should be examined in the mid-term evaluation. [EPA-HQ-OAR-2010-0799-9551-A2, p. 3]

It is therefore imperative that the industry and the agencies review and consider the outcomes of our work in 2012 in relation to the joint plan at the midpoint of the regulated period. With regard to the midterm evaluation, VCC emphasizes the needs and clarifications outlined in the Alliance comments. [EPA-HQ-OAR-2010-0799-9551-A2, p. 3]

For VCC, as an intermediate manufacturer, the common understanding and harmonization of approaches of the agencies is of great importance, and' ultimately leads to a very high level of administrative efficiency. It is critical for smaller manufacturers to reduce administrative costs in order to be able to focus on the relevant issues such as developing environmentally advanced technology. [EPA-HQ-OAR-2010-0799-9551-A2, p. 3]

The following criteria should be considered for the Mid-Term Evaluation:

• Are the costs of Advanced Technology Vehicles declining as predicted in the assessment in the NPRM?

• What impact will the new requirements have on sales of passenger cars and light duty trucks?

• How will the new rules impact vehicle safety?

• Is the needed fueling infrastructure available to enable PHEVs, BEVs and fuel cell vehicles to penetrate the market at the levels predicted?

• Are consumers purchasing the technologies needed to achieve the goals of the rulemaking?

• Multipliers for the period 2020-2025 need to be evaluated and reevaluated

• Off cycle technology - additional innovations identified between 2012 and 2018

• Harmonization between all agencies both regarding technology demands and administration - EPA, NHTSA and CARB [EPA-HQ-OAR-2010-0799-9551-A2, p. 3]

Organization: Weiner, L.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 107.]

So we ask that the midterm review be vigilant, and there should not be an opportunity to delay full compliance or, as has occurred occasionally in history, to dismiss part of the program. But we look at the mid-reviews to strengthen the compliance.

Response:

Section III.B.3. of the preamble provides a detailed discussion of the mid-term evaluation. As described there, the agencies are finalizing the mid-term evaluation and agency decision-making process as proposed. As stated in the proposal, both NHTSA and EPA will develop and compile up-to-date information for the mid-term evaluation, through a collaborative, robust and transparent process, including public notice and comment. The evaluation will be based on (1) a holistic assessment of all of the factors considered by the agencies in setting standards, including those set forth in this final rule and other relevant factors, and (2) the expected impact of those factors on the manufacturers' ability to comply, without placing decisive weight on any particular factor or projection. In order to align the agencies' proceedings for MYs 2022-2025 and to maintain a joint national program, if the EPA determination is that standards will not change, NHTSA will issue its final rule concurrently with the EPA determination. If the EPA determination is that standards may change, the agencies will issue a joint NPRM and joint Final Rule.

Overall support for finalizing the mid-term evaluation

Every automaker and associations representing either auto makers or suppliers who commented on the proposed mid-term evaluation indicated that this evaluation was essential to their support of the proposal and urged the agencies to finalize a comprehensive mid-term evaluation. These commenters included General Motors, Chrysler, Ford, Nissan, Toyota, Hyundai America Technical Center, Mercedes-Benz, Mitsubishi Motors, Volvo Car Corporation Porsche, Ferrari, KIA, the Alliance of Auto Manufacturers, the Global Automakers, the Motor & Equipment Manufacturers Association (MEMA), National Association of Manufacturers (NAM), EcoMotors International, Inc., and Johnson Controls, Inc. Two automakers, Chrysler and Nissan, specifically predicated their support of the MY2017-2025 National Program on the agencies finalizing the proposed mid-term evaluation. In addition, a number of other organizations including the United Auto Workers (UAW), the International Council on Clean Transportation (ICCT), U.S. Chamber of Commerce, Securing America's Future Energy (SAFE), as well as 112 members of the U.S. House of Representatives (in a letter to both agency heads) expressed strong support for finalizing the proposed mid-term evaluation.

Many environmental and consumer organizations, as well as many private citizens, both at the three public hearings and in written comments, expressed concern that the mid-term evaluation might be used as an opportunity to weaken the standards or to delay the environmental benefits of the National Program. Many stressed the expectation that the mid-term should be used as an opportunity to strengthen the MY2017-2025 standards. These commenters included the Pew Charitable Trust, Sierra Club, Union of Concerned Scientists (UCS), American Medical Association of California, the National Association of Clean Air Agencies (NAACA), Ecology Center and more 30,000 individual citizens who submitted letters to the docket. The ICCT expressed their strong support for the mid-term evaluation and

NESCAUM in discussing the need to evaluate technology incentives on the overall GHG goals of the program indicated their support of the mid-term evaluation for this purpose.

As discussed in section III.B.3 of the preamble, the mid-term evaluation will be a comprehensive and robust evaluation of all of the relevant factors. EPA is clear that any evaluation of the appropriateness of the standards and any decision to go forward with revising the standards will consider making the standards more or less stringent, whatever is most appropriate under the circumstances at that time. It would be inappropriate to limit EPA's consideration to either just increasing or just reducing the stringency of the standards. Instead, EPA will determine the appropriate course to follow based on all of the information, evidence, and views in front of it, including those provided during public notice and comment.

Two commenters opposed finalizing the mid-term evaluation. Natural Resources Defense Council (NRDC) stated that it was both unnecessary and potentially disruptive to automakers' product planning and would add uncertainty to a nine year period. The National Automobile Dealers Association (NADA) did not support the mid-term evaluation since it did not support the need for the underlying rulemaking "so soon after having set standards for MY2012-2016, and before having had the benefit of learning from how those standards work in the real world." EPA believes that the evaluation process will not be disruptive to the automakers product planning. Instead it provides a framework that allows manufacturers the certainty to go forward and prepare for these standards, as it both adopts them now as final standards and establishes a mechanism to evaluate and change them in the future, if appropriate. The common support from the manufacturers indicates that this is the case. The opposition by NADA is premised on their opposition to adopting standards in this rulemaking, which is addressed elsewhere.

Ensuring Coordination of Mid-term Evaluation

Ford, Toyota, NRDC and the UCS stressed the importance of a coordinated mid-term evaluation by EPA and NHTSA that should also include the California Air Resources Board (CARB). EPA agrees with this comment, as indicated by the discussion in section III.B.3 of the preamble. In adopting their GHG standards the California Air Resources Board (CARB), directed CARB's Executive Officer to, "participate in U.S. EPA's mid-term review of the 2022 through 2025 model year passenger vehicle greenhouse gas standards…" and to also, "continue collaborating with EPA and NHTSA as their standards are finalized and in the mid-term review."[7] In addition, the Board directed CARB's Executive Officer that "It is appropriate to accept compliance with the 2017 through 2025 model year National Program as compliance with California's greenhouse gas emission standards in the 2017 through 2025 model years, once United States Environmental Protection Agency (U.S. EPA) issues their Final Rule on or after its current July 2012 planned release, provided that the greenhouse gas reductions set forth in U.S. EPA's December 1, 2011 Notice of Proposed Rulemaking for 2017 through 2025 model year

[7] See California Low-Emission Vehicles (LEV) & GHG 2012 regulations approved by State of California Air Resources Board, Resolution 12-11 (March 22, 2012). Available at http://www.arb.ca.gov/regact/2012/leviiighg2012/leviiighg2012.htm (last accessed June 5, 2012)

passenger vehicles are maintained, except that California shall maintain its own reporting requirements." [8]

Clean Air Act Authority to conduct a mid-term evaluation

A number of auto manufacturers submitted comments agreeing that section 202(a) of the Clean Air Act (CAA) authorizes the proposed mid-term evaluation. Chrysler noted that the EPA had a "firm legal basis to conduct the mid-term evaluation under section 307(d) of the Clean Air Act (CAA) and the Administrative Procedures Act to reconsider regulations based on new information as well as under section 202(a) of the CAA under which EPA proposed the mid-term evaluation." The Global Automakers stated that a mid-term evaluation was, "not only permissible under the Clean Air Act, but also required because of the uncertainties inherent in projecting regulatory requirements nine to twelve years into the future," continuing that it "would have been arbitrary and capricious for EPA to promulgate GHG emissions standards for model years as far into the future as MY2022-225 without providing for a mid-term evaluation." Nissan indicated support for the views expressed by the Global Automakers and stated further that "a robust and comprehensive mid-term review is legally necessary to ensure that the standards for the later model years are supported by substantial evidence and are not arbitrary and capricious. (Citing Motor Vehicle Mfr's Ass'n v. State Farm, 463 U.S. 29,42 (1983) listing examples of arbitrary and capricious agency activity)."

EPA agrees that section 202(a) provides the agency with ample authority to undertake the mid-term evaluation. EPA does not agree that the mid-term evaluation is authorized under CAA section 307(d), as the mid-term evaluation is not a reconsideration of the standards under that provision. Instead the mid-term evaluation will be undertaken under EPA's general authority to establish emissions standards under section 202(a). EPA does not agree that the mid-term evaluation is legally required, or that the standards adopted today would be arbitrary and capricious or without substantial evidence to support them absent such a mid-term evaluation. The final rule and supporting information and analysis amply justify the reasonableness and appropriateness of the final GHG standards adopted by EPA, irrespective of the provisions for a mid-term evaluation. In any case, that issue is not before EPA as EPA is exercising its discretion to adopt provisions for a mid-term evaluation, for the reasons discussed above.

The Center for Biological Diversity (CBD) challenged the basis for the mid-term evaluation and specifically argued that any interim rulemaking should be based on a presumption that the stringencies of the standards will not decrease. As discussed above, the mid-term evaluation will be a robust and comprehensive evaluation, and it would be inappropriate to limit EPA's consideration to either just increasing or just reducing the stringency of the standards. Instead, EPA will determine the appropriate course to follow based on all of the information, evidence, and views in front of it, including those provided during public notice and comment. CBD also raised a concern that EPA would be applying a faulty weighting of the statutory factors under the CAA. CBD stated that highlighting the manufacturers' ability to comply was improper, and instead decisive weighting should be placed on energy conservation. EPA

[8] Id., CARB Resolution 12-11 at 20.

disagrees that it is improper to carefully consider the impact on manufacturers' ability to comply. When EPA conducts the mid-term evaluation, EPA will be evaluating standards that have already been adopted and for which manufacturers are required to comply. The ability to comply is an important part of determining the appropriateness of these standards. For example, ability to comply is directly tied lead time, a factor EPA is required to consider under section 202(a). EPA does not agree that it is appropriate to assign decisive weighting to any one factor, such as energy conservation. That is contrary to conducting a holistic assessment, where EPA carefully considers all of the relevant factors under section 202(a) and gives them the weight that is appropriate in light of all of the circumstances.

Recommendations for Additional “Check-ins” or Periodic Status Reports

Several automakers, auto suppliers and industry associations (General Motors, Chrysler, Daimler Automotive Group, Hyundai, Alliance of Automobile Manufacturers, Global Automakers, Inc and Johnson Controls) suggested that, in addition to the proposed formal mid-term evaluation, the agencies should also undertake a series of smaller, focused technical evaluations or “check-ins’ leading up to and potentially following the mid-term evaluation. Such check-ins, these commenters asserted, would allow the agencies to consider the latest relevant technical information, as well as other key issues. Several environmental organizations (Sierra Club, UCS, NRDC, and CBD) submitted comments opposing these focused technical evaluations or “check-ins,” arguing that these would be time consuming and too premature to judge technology readiness for the MY2022-2025 standards, and would undermine the intent and effectiveness of the mid-term evaluation. A number of environmental organizations also supported periodic updates on technology progress and compliance trends. The Sierra Club, while not supportive of the “check-in” concept, did urge agency transparency and access to data that would allow the public to “effectively and timely monitor compliance trends and technology applications.” The ICCT recommended that EPA and NHTSA conduct periodic updates on technology progress and consider periodic status reports in advance of the mid-term evaluation so that all interested parties could have access to key data that would be important in documenting progress in technology improvements and implementation.

As discussed above, the agencies will conduct a comprehensive mid-term evaluation and agency decision-making process for the MYs 2022-2025 standards as described in the proposal. The agencies expect to continue ongoing stakeholder dialogue, including in depth technical dialogue with automakers on their confidential technology development efforts and product plans for MYs 2022-2025. EPA does not believe that additional or more frequent reports, as suggested by some commenters would be an efficient way to prepare for the mid-term evaluation.

Timeline and Process for Mid-term Evaluation

Several auto companies including Ford, Toyota and Porsche noted the importance of the agencies meeting the proposed November 15, 2017, deadline for issuing the draft Technical Assessment Report (TAR) so that there is adequate time for a reasonable public comment period while still insuring that EPA meet its proposed April 1, 2018 deadline for determining whether the standards established for MY2022-2025 are appropriate under CAA section 202(a). The Alliance of Automobile Manufacturers, Global Automakers, and the National Association of

Manufacturers also expressed concern with the agencies' proposed schedule for undertaking the mid-term evaluation. These commenters recommended that additional details be written into the final regulatory text to provide more procedural certainty including: a start date for the evaluation, a schedule of major milestones, specific studies the agencies plan to conduct, and details of the peer review process. Toyota, Hyundai and Mercedes-Benz in their comments noted their support for these recommendations as well. Mitsubishi urged the agency to work with stakeholders well in advance of the mid-term to develop a sound review process and framework. Both the Union of Concerned Scientists and NRDC stated that the timing of the mid-term evaluation should be conducted as close as possible to the beginning of MY2022 so that the mid-term evaluation could most accurately capture the status of technology and the vehicle market for those model years under review.

EPA acknowledges the timing and other concerns raised by all commenters and continues to believe that the approach laid out in the proposal provides an appropriate balance between certainty and needed flexibility by providing end dates by which it must issue the draft TAR (November 15, 2017) and determine whether the MY2022- 2025 standards are appropriate under section 202(a) of the Clean Air Act (April 1, 2018). Additional regulatory details on the timing or content of the mid-term evaluation are not needed and would not be an efficient way to prepare for and conduct the mid-term evaluation.

Additional Evaluation Factors Should be Considered

In its proposal, EPA indicated that it would consider a range of relevant factors in conducting the mid-term evaluation, including but not limited to those listed in the preamble and proposed regulatory text. Quite a few commenters suggested that EPA expand the list of these high level factors. The Alliance of Automobile Manufactures recommended numerous additions to the list of factors including, "current and expected availability of state and Federal incentives/subsidies for advanced technology vehicles," "the end-of-life costs associated with advanced technology vehicles," and "consumer demand for and acceptance of fuel-efficient technologies, and consumer valuation of fuel savings." Honeywell encouraged the agencies to, "commit…to a detailed review of emerging boosting technologies that may considerably advance vehicle emissions and fuel economy performance during the later years of the rulemaking." The Institute for Policy Integrity commented that the agencies "should amend their list of factors to specifically reflect any potential changes to benefits estimates, in addition to changes to costs or the state of technology." Mitsubishi Motors commented that the mid-term factors must include an evaluation of the sufficiency of the EV infrastructure, including whether there have been any significant industry-wide economic setbacks making EVs and other overall fuel economy targets impracticable, consumer acceptance of EVs and a thorough evaluation of an EV multiplier in MYs 2022 through 2025 in order to continue EV market penetration. Also, Mitsubishi noted that the mid-term should include consideration of compliance options for OEMs with limited product lines. The National Association of Clean Air Agencies (NACAA) suggested that EPA evaluate the use of credits by automobile manufacturers and the impact of credit use on average fleet performance. The Clean Air Association of the Northeast States for Coordinated Air Use Management (NESCAUM) noted that it expected EPA to monitor upstream emissions from the power grid to determine whether the improvements assumed to occur were realized. Finally, the Sierra Club recommended that the agencies provide the public with data on credit use by manufacturers, technology penetration both overall and by manufacturers, and sales by vehicle footprints.

The Alliance for Automakers also indicated that the agencies should seek expert peer-reviewed information including the National Academy of Sciences to answer a number of questions associated with the Mid-term reviews.

A number of other commenters, including Ford, the UCS and ICCT supported the mid-term evaluation provisions as proposed by EPA. Ford commented that they believed the agencies had struck an appropriate balance between an exhaustive list and a high-level approach and pointed to proposed regulatory language "including but not limited to…" as critical language that should be maintained in final rule. Ford further noted that factors that turn out to be most important six years from now are not necessarily foreseeable today and not necessarily the ones listed in the proposed rule. The ICCT noted that "it is impossible to define all the criteria for review at this time…" And UCS agreed that "a holistic assessment of all of the factors… without placing decisive weight on any particular factor or projects" is the correct approach in conducting the mid-term evaluation."

EPA is finalizing the list of factors as proposed.[9] We believe these factors are broad enough to encompass all appropriate factors that should be considered during the mid-term evaluation, and provide the agency with an appropriate balance in that the list identifies major factors to consider and includes a clear provision for inclusion of other appropriate factors. This avoids trying to identify in detail at this time the myriad issues and factors that will be of concern in the mid-term evaluation. As in this rulemaking, in the mid-term evaluation EPA expects to place primary reliance on peer-reviewed studies. Additionally, as NAS reports are published, EPA will give careful consideration to reports and their findings as well as any reports and findings from other scientific and technical organizations.

As discussed above, the MY2022–2025 GHG standards will remain in effect unless and until EPA changes them by rulemaking. The National Association of Manufacturers (NAM) commented that EPA should not take the default position that the existing 2022-2025 model year standards will remain in place unless changed by rulemaking. Rather, they argued the existing standards should be rescinded immediately upon a determination that they are inappropriate, leaving the 2021 standards in effect until the revised standards are finalized. Another commenter, Toyota, requested that "in the event EPA does not take final agency action concerning the 2022-2025 model year standards by April 1, 2020, the 2021 model year GHG standards remain as the 'default' standards until such time as EPA does take final agency action providing at least 18-months of lead time prior to the applicable model year." EPA believes the appropriate approach is what was proposed; EPA is adopting the MY2022-2025 GHG standards at this time, and they will go into effect unless EPA revises them. The mid-term evaluation process is an effective and timely way to address any concerns that may arise in the future concerning the appropriateness of these standards. EPA believes this provides the right degree of certainty to the standards that are adopted today, along with a clear and effective mechanism

[9] See §86.1818-12 (h)

for the timely evaluation of the standards and their revision if EPA determines in the future that they are no longer appropriate based on the circumstances at that time.

2.5. Test Procedures

Organizations Included in this Section

AAA
American Lung Association of the Mid-Atlantic
Ferrari
Ford Motor Company
Johnson Controls, Inc.
Manufacturers of Emission Controls Association (MECA)
Marz, Loren C.
Motor & Equipment Manufacturers Association (MEMA)
National Automobile Dealers Association (NADA)
Necheles, L.
Securing America's Future Energy (SAFE)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Smith, Frank Houston
Tarazevich, Yegor
U.S. Coalition for Advanced Diesel Cars
Volvo Car Corporation (VCC)
Weiner, L.

Organization: AAA

While it is clear that substantial progress is being made to improve the program, AAA continues to have concerns with the real world accuracy of the testing procedures utilized to determine the mileage ratings under CAFE. [EPA-HQ-OAR-2010-0799-9484-A1, p. 1]

With this said, AAA continues to have concerns with the testing procedures used to determine miles per gallon (mpg) ratings under the CAFE program. AAA maintains that there are existing tests that can be used to produce more accurate fuel economy ratings. CAFE ratings in particular continue to be based on testing methodology from the 1970s, even though it has been acknowledged to be inaccurate. [EPA-HQ-OAR-2010-0799-9484-A1, p. 1]

In 2008, EPA adopted new testing procedures with input from the Automobile Club of Southern California’s Automotive Research Center. These procedures combined the results of three new dynamometer tests to provide a more accurate method of estimating mpg and showed these new ratings to be at least 30 percent lower than the unadjusted test results. In 2011, AAA worked closely with EPA and NHTSA to develop new vehicle labels that provide consumers with the clear and accurate information regarding safety, fuel economy, and GHG emission scores necessary to facilitate informed vehicle purchase decisions. [EPA-HQ-OAR-2010-0799-9484-A1, p. 2]

Unfortunately, CAFE numbers do not reflect these new testing procedures. Until testing procedures are harmonized, the discrepancy between the two ratings will only increase. AAA is interested in working with EPA and NHTSA to find a solution that provides the most accurate consumer information possible. [EPA-HQ-OAR-2010-0799-9484-A1, p. 2]

AAA commends NHTSA and EPA for working diligently with auto manufacturers and other stakeholders to reach an agreement on the proposed new standards. Having safe, energy-efficient vehicles is in everyone’s best interest, but it is equally vital to ensure that the testing used to gauge efficiency provides accurate results. Thank you for your consideration of AAA’s views. [EPA-HQ-OAR-2010-0799-9484-A1, p. 2]

Organization: American Lung Association of the Mid-Atlantic

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 82.]

We also support changes to testing procedures and calculations that properly reflect actual experience.

Organization: Ferrari

2) Test procedures [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

We believe appropriate to continue to measure CO_2 emissions and fuel economy using the traditional test cycles city (FTP) and highway (HFET) for the present proposal. It is reasonable for EPA to address different test procedures in the context of a future rulemaking. Enough lead-time should be given in case of any change in the test procedure for manufacturers to make necessary changes to test equipments, carry out tests, and reflect the new procedures in their compliance plans. [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

We also support the proposal that the 5-cycle test procedures would remain the starting point for demonstrating off-cycle emissions reductions. [EPA-HQ-OAR-2010-0799-9535-A2, p.11]

Organization: Ford Motor Company

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 46.]

In general, we continue to encourage the agencies to take a holistic view of the transportation sector to encourage the implementation of technologies and strategies whose benefits might otherwise be reflected in the formal fuel economy test procedures.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 35.]

With respect to our elements of the proposal, we will continue to work with the agencies to develop the test procedures necessary to validate off-cycle technology.

Organization: Johnson Controls, Inc.

Test cycles must be more reflective of the real-world. Johnson Controls is concerned that the proposed standards do not address one of the core problems with the standards - outdated city/highway drive cycle averages. Johnson Controls recognizes that the drive cycles must be a compromise between real world driving and testing workload/complexity. That said, the driving patterns and behaviors of American consumers have shifted dramatically in the past 40 years since the city/highway drive cycles were developed. The mere fact that the fuel economy labeling process for new vehicles has been adjusted twice since its inception is evidence that customer driving patterns are no longer properly reflected in the city/highway driving cycles. EPA's MOVES model includes an estimate that 13.5% of all driving (in terms of vehicle hours operating) nationwide is at idle. This is 50% more idling than the time weighted average idling time in the combined city/highway driving cycles of 9%. The Joint Technical Support Document (JTSD) issued with this NPRM offers giving 75% of theoretical difference in fuel economy benefit between MOVES and the city/highway drive cycles for start-stop technology as an off-cycle fuel economy and CO_2 credit. The rationale stated in the JTSD only offers 75% of the theoretical difference is due to engine warm-up characteristics and that start-stop functionality is disabled during that phase of the drive cycle. Johnson Controls believes this is a good start towards recognizing the benefit of start-stop technology. However, by placing a limit on the off-cycle credits that can be given to start-stop technology, the regulation may unintentionally place a limit on the level of innovation that could be employed to improve fuel economy, reduce the country's dependence on foreign oil. and reduce greenhouse gas emissions. While not directly involved in the business or technology of improving the warm-up characteristics of the engine, we do believe that innovations will continue to improve start-stop operation, consistency, and predictability. Customers recognize the tangible fuel savings benefits of start-stop technology since they can readily recognize the engine is not running and, therefore, not consuming fuel. This customer feedback to the OEMs will naturally drive technology and innovation to ensure that start-stop functionality is available under more operating conditions - including wider ambient temperature and wider engine operating temperature. Johnson Controls recommends offering more flexibility to the OEMs for off-cycle credits for start-stop technology if they can provide evidence of the operational characteristics of the technology performing better than 75% of the theoretical benefits. Johnson Controls also recommends the drive cycles be revisited and new drive cycles be developed which reflect the driving styles of today’s driver. To reduce workload, global harmonized drive cycles (aka WLTP proposed by the UNECE) should be considered. [NHTSA-2010-0131-0253-A1, pp. 3-4]

Organization: Manufacturers of Emission Controls Association (MECA)

Current U.S. light-duty CAFE/greenhouse gas emission requirements both use the FTP and highway fuel economy test cycles with specified weighting to determine a vehicle's fuel economy. The current weighting puts a larger emphasis on fuel consumption (or greenhouse gas emissions) during urban driving (FTP test cycle) than highway driving (highway fuel economy test cycle). EPA recently switched to a 5-cycle approach for light-duty vehicle fuel economy labeling. The rulemaking documents associated with EPA's new fuel economy label requirements provide important information and data that supports the choice of this 5-cycle approach as more representative of how vehicles are driven by U.S. vehicle owners compared to the current CAFE 2-cycle requirement. [EPA-HQ-OAR-2010-0799-9452-A3, p.3]

MECA believes that any regulatory requirements associated with greenhouse gas emissions should be based on real-world driving or usage patterns in order to ensure that regulatory standards reflect actual vehicle operations and deliver the greenhouse gas emission reductions that are needed. Vehicle manufacturers and emission control technology manufacturers need a valid test cycle for greenhouse gas emission to engineer and evaluate vehicles consistent with how they are used by the public. The weighting of the test cycle between urban and highway driving modes will have a significant influence on the choice and optimization of powertrain options that will be used to meet any future greenhouse gas emission or fuel economy standards. Work is already underway in Geneva, Switzerland under the United Nations GRPE harmonization umbrella to bring forward a new light-duty vehicle test cycle for use in quantifying real world greenhouse gas emissions. EPA and California should utilize test cycles for the purpose of measuring and controlling vehicle greenhouse gas emissions that are representative of real world driving patterns. [EPA-HQ-OAR-2010-0799-9452-A3, pp.3-4]

Organization: Marz, Loren C.

EPA needs to adjust the methodology for calculating 'combined' mileage for the purposes of CAFE. The 55% city/45% highway mix is apparently no longer representative based on the 43% city/57% highway mix EPA now uses in its MOVES model and also used in Argonne National Laboratory's GREET model. Furthermore, Bosch reports that based on a recent GPS study in California, the median driving intensity is between the highway (HWFET) and US06 cycles (http://www.erc.wisc.edu/documents/symp09-Freitag.pdf - slide #24). Having an unrepresentative drive cycle mix will skew how effective the results of proposed rule will be in the real world, and inappropriately favors hybrid/EV/PHEV/FCV technology in CAFE calculations. [NHTSA-2010-0131-0213-A1, p.5]

This is already becoming apparent based on a study by Oak Ridge National Laboratory (Lin, Z., and Greene, D. 'Predicting Individual Fuel Economy.' SAE Technical Paper #2011-01-0618) as the current 5-cycle fuel mileage values underestimate hybrid fuel mileage by an average of about 10%, while the fuel mileage of diesel vehicles is underestimated by an average of about 25%. EPA essentially acknowledged this trend in a 2006 publication ('Final Technical Support Document - Fuel Economy Labeling of Motor Vehicle Revisions to Improve Calculation of Fuel Economy Estimates', page 8). [NHTSA-2010-0131-0213-A1, p.5]

Organization: Motor & Equipment Manufacturers Association (MEMA)

Test procedures must be more reflective of the real-world. The current and proposed standards do not address one of the core problems with the standards – outdated highway/city drive cycle averages. Real-world benefits can only be achieved with real-world measures. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

The current and proposed standards do not address one of the core problems – outdated highway/city drive cycle averages (a split of 55 percent city and 45 percent highway). The EPA's own study illustrated the switch in driving behaviors since the original averages were set.2 Real-world benefits can only be achieved with real-world measures. Changing the approach could have profound effects on deployment of research funds and capital investment, on the choices of vehicle technologies, and on the real-world results for the consumer, emissions reduction, and fuel efficiency. Otherwise, the industry will make cost-benefit decisions on technologies to maximize the fuel economy numbers with a 55-city/45-highway split and will make long-term technology and capital decisions without an assurance that those decisions will produce real-world results for the consumer and the country. Moreover, by continuing to use outdated mileage formulas for current, real-world city/highway driving averages, the result is another unintended consequence of influencing the market toward "preferred technologies" (because it is slanted towards city-like driving). [EPA-HQ-OAR-2010-0799-9478-A1, p.4]

While new test procedures would be beneficial for real-world evaluation of CO_2 and fuel efficiency, until such time they are implemented, off-cycle credits are a good way to ensure manufacturers are encouraged to introduce technology(ies) that result in real-world improvements. Although, MEMA recognizes the challenges with the tall task of changing the FTP/HFET, we urge the agencies to continue to actively work on global harmonization efforts to develop test cycles that better reflect real-world driving habits and performance so that, ultimately, the root causes can be addressed, resolved and incorporated for future iterations of this Program. [EPA-HQ-OAR-2010-0799-9478-A1, p.4]

Test procedures must be more reflective of real-world conditions. [EPA-HQ-OAR-2010-0799-9478-A1, p.13]

Organization: National Automobile Dealers Association (NADA)

The final rule should be as performance-based as possible and, in doing so, treat all compliance technologies as fairly as possible. Unfortunately, the single CAFE test cycle inherently serves to disadvantage certain technologies over others to the extent that it fails to account for how those technologies are actually used. For example, vehicles with hybrid and plug-in technologies benefit from test cycles that emphasize city driving, vehicles with start-stop technologies benefit from test cycles with long idling periods, and vehicles with diesel engines benefit from cycles with a higher proportion of highway driving. To the extent allowed by law, where NHTSA and EPA have data showing that certain technologies are or will be used in a manner that varies from the CAFE test, or that are off-cycle, appropriate adjustments should be made. Moreover, appropriate adjustments should be made to the final rule to reflect that real world gasoline does not offer as much energy potential as the fuel used in the CAFE test. [EPA-HQ-OAR-2010-0799-9575-A1, pp. 10-11]

Organization: Necheles, L.

I am only a Juvenile Attorney so I honestly don't have a science background. What I am concerned about and can comment upon, as a lay person, is how the EPA calculates vehicle fuel mileage as seen on the stickers of new cars. 'EPA estimated fuel mileage.' [EPA-HQ-OAR-2010-0799-2487-A1, p. 1]

Based upon personal experience and observation, the current calculated gas mileage shown on stickers does not reflect reality. The Consumer Reports or Car and Driver 'observed' fuel mileage is the best indicator and predictor of fuel mileage that I have at my disposal. Please consider testing vehicles under real-world, reliable conditions. For instance, for Highway Driving: [EPA-HQ-OAR-2010-0799-2487-A1, p. 1]

1. Use ordinary fuel purchased from a local retailer-gas that might be contaminated with water or particles or may not be 87 Octane...fill the car with gas like an everyday consumer. 2. Drive the car at speeds of 70-75 miles per hour. 3. Use an intestate like the Pennsylvania Turnpike or Kansas Turnpike that contain hills. 4. Use full throttle at least once to simulate overtaking a truck. 4. Use the AC and CD player and a phone charger..load on the engine. 5. One tire at least 5 pounds under inflated. 6. 50 pounds of junk in the trunk....i.e. extra coolant, window washer fluid, jumper cables, tire inflator, flash light, groceries, kids toys, car seats, etc. (Items people lug around everyday) 7. Headwinds and cross winds of at least 10 mph should be factored in. 8. Slow down and speed up for 'construction zones' and make a full stop for a simulated rest room break:, 9. Use a front plate on the car. [EPA-HQ-OAR-2010-0799-2487-A1, p. 1]

Organization: Securing America's Future Energy (SAFE)

Vehicle Testing Procedure: The testing procedure that EPA uses to measure vehicle fuel economy is outdated, does not reflect actual driving patterns, confuses the public, undermines agency credibility, and ultimately discourages consumers from purchasing efficient and cost-effective vehicles. [EPA-HQ-OAR-2010-0799-9518-A1, p. 14]

For the purpose of measuring fuel economy for fuel economy and carbon emission regulations, EPA relies of two tests developed in the 1960s and 1970s that simulate urban and highway driving at relatively low speeds, in moderate weather, and without operating any vehicle accessories. In the 1980s EPA started adjusting the fuel economy measurements downward for the purpose of calculating the fuel economy that was placed on vehicle fuel economy labels so that the figure would more closely reflect actual driving experiences. As the gap between real world fuel economy and the figures on the label continued to grow, the Energy Policy Act of 2005 required EPA to revise its calculation for fuel economy labels again. Beginning with MY 2008 vehicles, EPA employed an updated test procedure which added three drive cycles to the calculation to evaluate fuel economy at high speeds, in cold weather, and in hot weather. Yet for fuel economy and carbon emission regulations, EPA continues to rely solely on the original drive cycles that are forty years old. They are estimated to overstate actual fuel economy by about twenty percent. [EPA-HQ-OAR-2010-0799-9518-A1, p. 14]

Yet in this proceeding, the characterization of fuel economy is more complex because in addition to calculations of fuel economy based on fuel consumption, the proposal reports calculations of fuel economy that are really fuel economy equivalents of emission standards. In the proposed rule and the accompanying announcements the agencies characterized the requirements that automakers will have to achieve by MY 2025 as "equivalent to 54.5 miles per gallon (mpg) if the vehicles were to meet this CO_2 level all through fuel economy improvements." It was this level of fuel economy that both agencies highlighted in their press materials and which was widely reported in the mainstream media. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 14-15]

In reality, all emission reductions will not be achieved through improvements in fuel economy. The agencies acknowledge this point, which is reflected in the fact that NHTSA stated that the fuel economy actually required pursuant to the rule would be 49.6 MPG. NHTSA then proceeds to explain that that estimate, however, also is overstated because it does not account for regulatory flexibilities that it is not allowed to consider in establishing the standards. NHTSA estimates that the achieved fuel economy under the proposed rule would yield a fleet average of 47.0 MPG. Yet even that estimate only reflects the estimated achieved fuel economy measured using the outdated test procedures. The 47 MPG estimate probably overstates the mileage that will be reflected on a vehicle's fuel economy label by about 20 percent, meaning that the fuel economy label would indicate a fuel rating closer to 38-40 MPG. And, even the figure on the label often overstates the vehicle's actual fuel economy, a point that contributed to a Honda Civic owner successfully suing Honda because her Civic Hybrid achieved far poorer fuel economy that indicated on the vehicle's label. [EPA-HQ-OAR-2010-0799-9518-A1, p. 15]

Therefore, in this instance, there may be as many of five different figures by which one could characterize the fuel economy requirements in the rule, enough to confuse most any consumer. [EPA-HQ-OAR-2010-0799-9518-A1, p. 15]

In the preamble to the rule, the agencies noted that consumers often choose not to make cost-effective investments in efficiency. The agencies identified several reasons why consumers might not purchase more fuel efficient vehicles that are cost effective, suggesting that consumers might be myopic, lack information to estimate the value of fuel savings, or might associate fuel efficiency with small poorly made cars, among other reasons. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 15-16]

The agencies should consider the extent to which multiple measures of fuel economy undermines confidence in the accuracy of the calculations, making it difficult for reasonable consumers to have any confidence in any single fuel economy number, or the calculations of cost-effectiveness based on them. SAFE believes that EPA should once again revise the test procedures to more closely reflect real world driving conditions and use the revised test in its carbon emission regulations. Likewise, NHTSA should use an updated test procedure for lightduty trucks, though it cannot adjust the test procedure for cars without Congress updating the statute. More importantly, however, EPA and NHTSA should work together to determine how to simplify the calculation of fuel economy so that it most accurately reflects real world conditions. They should then propose to Congress the appropriate changes to the law so that they may replace outdated and inconsistent test procedures with more accurate ones that will inspire confidence in the regulation system instead of undermining the public's confidence in it. [EPA-HQ-OAR-2010-0799-9518-A1, p. 16]

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Take steps to address testing issues: Both agencies have recognized that the standards do not correlate with the mileage or emissions of vehicles consumers should expect to see in dealership showrooms or experience on the road. While the standards that are proposed for 2017-2025 vehicles are anticipated to yield a fleet of new vehicles in 2025 that averages 54.5 mpg (if all improvements are made through efficiency) and emits 163 g/mi of CO_2, there are various factors that reduce this standard to the much lower average of 37 miles per gallon that consumers will see on new vehicle labels. [EPA-HQ-OAR-2010-0799-9549-A2, p. 9]

In a report released last summer, Sierra Club detailed the history of CAFE standards and the testing regime that is used to set the standards and measure compliance. This testing regime remains as it was prescribed in the original fuel economy law. Testing for determining the mileage and now greenhouse gas information has gone through several updates with the goal of providing consumers shopping for new vehicles more accurate information. As a result of the divergent testing regimes, there is a confusing set of numbers - one for standards (i.e., the proposed 54.5 mpg and 163 g/mi CO_2 fleetwide average in 2025) and another that reflects the on-road impact of the program (i.e., consumers should anticipate vehicles averaging 37 mpg in 2025, not 54.5 mpg). Our report detailed how we ended up with a confusing set of numbers that persists with these proposed standards. [EPA-HQ-OAR-2010-0799-9549-A2, p. 9]

In the proposed and final rules for 2012-2016 vehicles both EPA and DOT recognized the disparity between standards and on-road mileage and pledged to address the issue before issuing further standards. The process for further standards launched within weeks of that those standards were final and the MPG values used to define the standards and the discrepancy between standards and labels is now further impacted by the accounting for AC and off-cycle reductions in the standard setting process. In the NPRM, the "on road fuel economy gap is recognized, and the agencies continue to apply a 20% discount to the standards to assess real world mileage and emissions and in calculating benefits associated with the standards. [EPA-HQ-OAR-2010-0799-9549-A2, p. 9]

The agencies are proposing in this rule to revise testing for purposes of measure compliance with the standards to account for some changes in air conditioning systems and some "offcycle" reductions, but this leaves the actual standards themselves still tied to outdated testing. As we noted in our report and in comments to the MY 2012-16 rule, steps could and should be taken to address the outdated testing used for setting the standards and to ensure that the public is fully and fairly informed. The fact remains that today's new vehicles average in the low 20 mpg range and new vehicles in 2025 will be nearly twice as efficient, on average. Consumers, however, who shop for a new vehicle in 2025 should seeing label values average around 37 mpg, not 54.5 mpg. While the proposed rule indicates that adjustments will be made for testing for compliance with fuel efficiency standards, we continue to urge both agencies to take steps to reform testing for setting the standards and to take steps to inform the public about the standards and what consumers should expect to see in dealerships. [EPA-HQ-OAR-2010-0799-9549-A2, pp. 9-10]

Organization: Smith, Frank Houston

EPA versus NEDC Test Cycles

Regarding the relationship between NEDC and EPA test cycles please consider …

NEDC and fuel frugal diesels: Compare

http://www.autocar.co.uk/SpecsPrices/SpecsAndPricesEdition/Volkswagen-Jetta-2.0-TDI-140-SE-/62466/ at 58.9 mpg(Imperial) combined ==> converts

to ~49 mpg(US) to US Individual (user) MPG Estimates

http://www.fueleconomy.gov/mpg/MPG.do?action=mpgData&vehicleID=31577&browser=true &details=on at 45.5 mpg(US) with roughly 75% highway … with an EPA sticker of 34/42 mpg(US) combined/highway. [NHTSA-2010-0131-0240-A1, p.3]

Which better reflects US user estimated average experience, US sticker or the convert NEDC value? I believe you will find that the converted NEDC value (for diesels) more closely reflect USER Average experience. This appears to be relatively typical for Audi and VW's This tracking relationship between US user AVERAGE mpg experience and the converted NEDC combined mpg(Imperial) values seems to be relatively consistent for fuel frugal small displacement (Further, these VW/Audi vehicles are certainly NOT the best available diesel fuel economies in the world compared to 2.0~1.5 US gallons/100 miles that is more or less standard practice for significant portions of the > 49 mpg(US) combined EU offerings as demonstrated by Table 5 above… with diesel machines that look and function much like ones already in the US … EXCEPT for superior fuel economy. [NHTSA-2010-0131-0240-A1, p.3]

Organization: Tarazevich, Yegor

CAFE should be measured in EPA real world test numbers otherwise manufactures would continue to learn tricks to show even higher CAFE numbers which do not translate to real world numbers. 30 years ago CAFE MPG were very close to real world MPG but right now, CAFE 54.5 MPG in real world means only 40 MPG. Otherwise in 2025 CAFE 54.5 MPG could become EPA 35 MPG only. [NHTSA-2010-0131-0199, p.1]

Organization: U.S. Coalition for Advanced Diesel Cars

Emissions testing and calculations that: [NHTSA-2010-0131-0246-A1, p.2]

Use market fuel rather than higher energy content laboratory fuel; [NHTSA-2010-0131-0246-A1, p.2]

Employ real-world driving conditions; [NHTSA-2010-0131-0246-A1, p.2]

Accurately reflect the full environmental impact of each technology (not just at the vehicle's tailpipe); and [NHTSA-2010-0131-0246-A1, p.2]

The Coalition continues to advocate for fuel economy calculations that provide the clarity consumers require to make informed decisions and select a vehicle that best meets individual driving needs. This includes up to date calculations for real world driving and steps to limit the disparity between fuel economy measurements achieved in the laboratory and the real world. [NHTSA-2010-0131-0246-A1, p.10]

Real World Driving [NHTSA-2010-0131-0246-A1, p.10]

During the comment period for the MY 2012-2016 joint rulemaking on CAFE, the Coalition called attention to EPA and NHTSA's failure to utilize real world driving calculations. EPA's own data from a 2006 study confirms that the average American accumulates the majority of their miles at highway conditions. In spite of this, calculations that indicate drivers accumulate the majority of their miles in urban conditions were utilized for the MY 2012-2016 rule, and are again used in the MY 2017-2025 proposed rule. [NHTSA-2010-0131-0246-A1, p.10]

Interestingly, EPA is not using its own data and public information to calculate the most accurate fuel economy for CAFE despite the fact that it already utilizes the 2006 data to calculate the societal benefits resulting from the implementation of advanced vehicle technology. Because the calculations inaccurately reflect the driving patterns of the average American, EPA and NHTSA are causing automakers to disproportionately employ technologies that perform well in urban duty cycles in new vehicles, causing automakers to lean toward technologies that are not optimized for the needs of the average American driver. [NHTSA-2010-0131-0246-A1, p.10]

The NPRM states that EPA and NHTSA are considering significant changes to test procedures in response to the wide array of vehicle technologies available. The agencies have also stated that they lack the statutory authority to change some of these calculations. If EPA and NHTSA have determined that they lack the statutory authority to update the calculations to reflect the real world driving habits of the current American driver, the agencies should educate Congress on the impacts of this flawed statute and formally ask for the statutory authority from Congress to update the calculations. Instead, the current proposals risk yet another rulemaking process that will propagate the outdated and inaccurate 1975 calculations for the next decade and beyond. [NHTSA-2010-0131-0246-A1, p.11]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 248-249.]

By continuing to use outdated calculations, it may very well appear that manufacturers have reached the new fuel economy and emissions goals, but it is likely that the real-world impact will fall short of our nation's targets. Additionally, a significant disparity will continue between actual fuel economy and what consumers were expecting when they purchased their vehicles. This is evident from the recent class-action and small claims litigation by thousands of hybrid owners. In the Detroit Free Press on January 6, 2012, Neil Schmidt, a technical specialist for American Honda, explained the disparity between fuel economy on the sticker versus what the drivers were actually achieving. 'We have no choice. We have to put these numbers on the label.' He noted the small type on the label, which gave a listing of 41 to 57 miles on average, saying, 'This is more toward the real world.' The important point for this discussion is that government standards need to be consistently based on real-world driving patterns for the American consumer, and therefore optimized for highway driving, to achieve the greatest real world results. [NHTSA-2010-0131-0246-A1, p.11]

Organization: Volvo Car Corporation (VCC)

CC has put considerable time and effort into maintaining a high degree of accuracy by having well-developed arrangements to monitor calibrations, checks, and all critical processes in our emission laboratory. We work continuously to monitor and improve the correlation and repeatability of our test rooms. Thus, VCC realizes that test procedures, calibrations, and instrumentation must be regularly reviewed and renewed to meet new challenges. [EPA-HQ-OAR-2010-0799-9551-A2, p.13]

In the fall of 2011 EPA proposed, under TIER 3, to consolidate all test procedure requirements of Parts 86 into Part 1066 in order to improve their organization, including references to Part 600. In doing this, some test procedures will remain as they are, some will evolve, and new ones will be introduced. This will also come to affect procedures that involve CO_2 /FE. This has to be considered. [EPA-HQ-OAR-2010-0799-9551-A2, pp.13-14]

Along with the industry, VCC pointed out that close industry-EPA collaboration is critical to ensuring that test procedures are relevant, adequate, and meet the objective standards so that the tests can be reproduced and replicated. The initial EPA proposal would have required major investment from VCC, but based on current discussions there appears to be an understanding that there are other possible ways to address measurement. [EPA-HQ-OAR-2010-0799-9551-A2,p.14]

VCC has therefore been actively involved in addressing issues directly with the EPA and through the Alliance on the proposal that was presented by EPA in November 2011. Based on VCC's ongoing analysis of Part 1066, VCC believes that these proposed processes would benefit from thorough revision, in cooperation with the industry, to minimize the risk of creating processes that will add very little value to good repeatability and accuracy. EPA has recognized industry's challenges and therefore continues to work with industry on this issue. VCC would welcome CARB's participation in that dialogue. [EPA-HQ-OAR-2010-0799-9551-A2, p.14]

Currently there are crucial differences between CARB and EPA advanced technology vehicle test procedures that would benefit from harmonization. [EPA-HQ-OAR-2010-0799-9551-A2, p.14]

Hybrid Test Procedures

The hybrid test procedures need to be updated to reflect a common approach between EPA and CARB. EPA extensively refers to SAE J1711 test procedures updated during 2010. The J1711 test procedures are the result of many years of cooperative work between industry and government, which includes EPA and CARB. CARB's corresponding test procedures are based on J1711 of 2008/2009. There are several changes between these two versions which are going to generate extensive updating. If the harmonization does not occur, there will be unnecessary additional test burdens on the industry as a result of duplication of testing and uncertainty concerning the certification requirements. [EPA-HQ-OAR-2010-0799-9551-A2, [p.14]

Organization: Weiner, L.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 107-108.]

It's important that agencies develop new, precise test procedures that actively calculate the true mileage and not an overestimation, as has happened before.

Response:

EPA received a limited number of comments on test procedure changes being finalized by this rule, which are intended to account for impacts on fuel economy not currently included in the CAFE test procedures, as described in section III.B.10 of the preamble.

Several commenters noted that the test procedures used for this rule are different from those used for determining fuel economy label values, and requested that the methods be harmonized (AAA, U.S. Coalition for Advanced Diesel Cars). While EPA has broad discretion in our authority to calculate average fuel economy across manufacturers' fleets, we are required under EPCA 32904(c) to measure fuel economy for each car using "the same procedures for passenger automobiles the Administrator used for model year 1975 …, or procedures that give comparable results". In response to comments urging Congressional action, Congress was certainly aware of this issue in promulgating the EISA amendments to EPCA in 2007 and left this provision unamended. A more detailed discussion of the statutory authority is provided in section III.B.10 of the preamble. Although there is no outright legal bar to adopting a different test procedure for the other light duty vehicles (including MDPVs and light trucks), there are significant practical constraints. Virtually all data on control technology efficiency is based on performance over the CAFE two-cycle test procedure. See 75 FR at 25332, 25408 ("EPA simply lacks the technical basis to project the effectiveness of the available technologies over these three test cycles and therefore, could not adequately support a rule which set CO2 standards based on the five-cycle formulae.") In addition, having car standards based (for legal reasons) on two-cycle testing and truck standards based on five-cycle testing would raise obvious issues regarding implementation and harmonization (for example, crafting an ABT program, assessing costs, developing a proper relation between car and truck curves). As a result of these legal and practical restrictions, we are not adjusting the test procedures used in this rule to better reflect real-world driving. This is in contrast to the approach that EPA has taken for the fuel economy label, which is not subject to the same statutory restrictions. For the fuel economy label, EPA uses the five-cycle test procedure to better account for real-world driving conditions, and address issues similar to those expressed by commenter L. Necheles. EPA does not agree with the conclusion drawn in comments from SAFE that difference between test procedures for labeling and compliance will confuse consumers, noting that test results for individual models used to determine manufacturer fleet compliance are not widely publicized, and are likely to be unknown to the average consumer.

Furthermore, EPA does not believe the restrictions imposed by EPCA on test procedures will have any impact on the level of emissions reductions and fuel savings that will be achieved as a result of this rule. EPA notes that the car and truck standards in this rule were determined with consideration of cost, feasibility of technology adoption, lead time, and consumer acceptance. A change in test procedures for which the primary effect is a proportional decrease (or increase) in test values would alter the standard curves, but would not affect the level of adoption of efficiency technologies required to comply with the standards.

3. Air Conditioning System Credits

Organizations Included in this Section

Alliance of Automobile Manufacturers
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
Center for Biological Diversity
Ferrari
Ford Motor Company
Honeywell International, Inc.
United Automobile Workers (UAW)
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

The proposed rules properly include various provisions offering manufacturers some flexibility in developing their plans to comply with the CAFE and GHG standards. Some of these provisions enable manufacturers to earn credits that can be used to satisfy part of their compliance obligations. While some may think the term 'credits,' as used here, connotes reduced stringency or even 'loopholes,' that is not the case. The objective of the CAFE and GHG standards is to reduce actual fuel consumption and actual GHG emissions from vehicles driven on American roads. In some cases, however, the laboratory testing used by the agencies to measure fuel economy and GHG emissions may not fully reflect the improvements built into a vehicle by the manufacturer, due to limitations of laboratory-based tests. And improvements to reduce MAC system refrigerant loss can reduce GHG emissions from vehicles while having little or no impact on fuel economy. It is important for the rules to properly account for such factors. Otherwise, manufacturers would be encouraged to focus solely on the test procedures, and opportunities for real-world GHG reduction and fuel economy improvement would be lost. The Alliance believes that the various credit provisions proposed by EPA and NHTSA are essential elements of the rulemaking package. Below we offer our specific comments on the details of these provisions. [EPA-HQ-OAR-2010-0799-9487-A1, p.10] [[This comment can also be found in Outline Heading 7.]]

Introduction [EPA-HQ-OAR-2010-0799-9487-A1, p.46]

The MAC credit provisions have become an essential piece of EPA’s GHG program. Rapid progress is underway as a result of the
MY 2012-2016 provisions to improve MAC efficiency, reduce refrigerant leakage, and switch to a new low global warming refrigerant. In order to maintain the progress made in improving MAC, as well as the overall integrity of the broader GHG program, the MAC provisions must be continued in MY 2017-2025 at unreduced credit levels. This was one of the foundations of the consensus to move forward toward the dramatic GHG reduction targets set through MY 2025, as the program stringency is designed on the basis of these alternative compliance mechanisms. Any obstacles that would prevent maximum attainment of MAC credits are therefore a

fundamental threat to the achievement of the overarching program goals. [EPA-HQ-OAR-2010-0799-9487-A1, p.46]

The Alliance comments are directed toward making a success of the MAC provisions through efficient crediting processes that achieve real-world GHG reductions, commensurate with the credit levels granted. The Alliance stands ready to work with the agencies to address the concerns outlined below. [EPA-HQ-OAR-2010-0799-9487-A1, p.46]

Organization: Association of Global Automakers, Inc. (Global Automakers)

The air conditioning system credits provide manufacturers flexibility in pursuing a variety of enhancements to system efficiencies and the use of advanced low global warming refrigerants. We see the flexibility mechanisms as an essential part of this program. [EPA-HQ-OAR-2010-0799-9466-A1, pp. 1-2]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 67.]

Organization: BMW of North America, LLC

Credit generation regarding direct (leakage) and indirect (fuel efficiency) emissions is generally supported. Details to be modified from our point of view are listed below. The aim is to ensure best objective methods as well as practicability and fairness. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 1]

Organization: Center for Biological Diversity

4. A/C credits should be eliminated

We support the use of all technologies that improve the efficiency of air conditioning systems and the employment of refrigerants with lower carbon footprints. However, these efficiency improvements and greenhouse gas reductions should not be approached by way of credits. The technology to accomplish them is or will be readily available and is economically feasible.105 Their use should be built into the standard rather than merely incentivized. [EPA-HQ-OAR-2010-0799-9479-A1, pp. 22-23]

105 As ICCT notes, vehicles with low greenhouse gas warming potential refrigerants are already being sold in Europe; it is preposterous to assume that the U.S. fleet cannot utilize them in all A/C systems by 2017. ICCT Comments at 42. [EPA-HQ-OAR-2010-0799-9479-A1, p. 23]

Organization: Ferrari

We agree with EPA's proposal that allows manufacturers to generate credits by reducing CO_2 equivalent emissions due to improved air conditioning systems, for reduced leakage (direct) and enhanced A/C system management with consequent reduced tailpipe CO_2 (indirect) emissions. This is consistent with the goal to reduce the greenhouse gases associated with vehicles regardless of the source. [EPA-HQ-OAR-2010-0799-9535-A2, p.13]

Organization: Ford Motor Company

Ford fully supports all aspects of the Alliance comments on Mobile Air Conditioning (A/C) credits. We believe these credits are an integral part of both the EPA and NHTSA programs. The stringency of the standards has been set using specific assumptions on a manufacturer's ability to make widespread use of this incentive program. It is therefore imperative that the agencies finalize requirements that allow companies who implement these technologies, which result in real world CO_2 reductions, to receive the appropriate benefit. In support of this overarching goal, Ford has the following comments: [EPA-HQ-OAR-2010-0799-9463-A1, p. 10]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 46-47.]

Manufacturers are developing more innovative in-vehicle systems such as more efficient air conditioning, use of refrigerants with lower global warming potential, and improvements in energy management and aerodynamics. These technologies provide a real-world benefit for drivers but are not fully reflected on the fuel economy label. We commend the agencies for acknowledging these technologies in the rulemaking.

Organization: Honeywell International, Inc.

Honeywell supports EPA and NHTSA's decision to continue and expand upon the A/C Credit Program to provide strong incentive to eliminate the emissions of greenhouse gases ('GHGs') from NC systems and improve energy efficiency in A/C operations to reduce fuel consumption. Consistency and technology neutrality are critical factors in designing regulations that enable businesses to invest in innovative technologies, systems, and controls. [EPA-HQ-OAR-2010-0799-9497-A1, p.3]

We believe that good regulatory approaches are performance driven, technology neutral, and provide some flexibility. They must accommodate for new developments and reflect the best available science and data. Honeywell believes that EPA should provide flexibility to accommodate for new developments in controls and test methods for measuring emissions and improvements in energy efficiency in A/C system programs. Incorporating the most up-to-date research and technical information will add further credibility to the A/C Credit Program by accounting accurately for emission reductions and energy efficiency attributable to alternative refrigerants. [EPA-HQ-OAR-2010-0799-9497-A1, p.4]

EPA and NHTSA must continue to maintain a clear regulatory approach that provides businesses across the life of a light vehicle's A/C system with the regulatory certainty to commercialize effectively and transition rapidly to low GWP refrigerants. This confidence in the regulatory system enables manufacturers such as Honeywell to take the risks necessary to innovate and solve our most pressing environmental and energy security challenges. Currently, markets for low GWP refrigerants are highly sensitive to standards, specifications, and incentives such as those established in the Proposed Rule. Continuation of the A/C Credit Program beyond 2016 based upon best available science clearly advances the goals and objectives of fuel economy and GHG emissions programs. [EPA-HQ-OAR-2010-0799-9497-A1, p.4]

In sum, Honeywell supports EPA and NHTSA's approach to continue and expand upon the A/C Credit Program beyond 2016, and the recognition of the important contribution that alternative refrigerants will make toward meeting both fuel economy and GHG emissions objectives. [EPA-HQ-OAR-2010-0799-9497-A1, p.12]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 206-210.]

Organization: United Automobile Workers (UAW)

The UAW also supports EPA's proposal for air conditioning improvement credits and so-called "off-cycle" credits. Air conditioning credits recognize real-world reductions in climate change pollution that occur through reduced leakage of chemicals with high global warming potential from air conditioning systems, the substitution of less harmful chemicals in air conditioning systems, and more efficient systems that draw less power from the engine and result in lower CO_2 emissions to run the compressor. [EPA-HQ-OAR-2010-0799-9563-A2, p.3]

Organization: Volvo Car Corporation (VCC)

In the GHG regulation for MY 2012-2016 EPA introduced the AC credits as an opportunity to achieve some flexibility in compliance with standards equivalent to the opportunity that exists within CAFE by paying fines for deviation. Hence rewarding the manufacturer who has a good engineering solution, the AC credit has become a very important part of the national GHG program. It is therefore important that this momentum is maintained. Also for this part of the program, it is critical that EPA and NHTSA interact with CARB in order to enable consistent design requirements and reporting requirements for maximum efficiency of both manufacturers and government. [EPA-HQ-OAR-2010-0799-9551-A2, p. 8]

Response:

EPA acknowledges comments of general support for the proposed program in the preamble to this rule, Section II.F.1. With regard to the comment from CBD that the standards should reflect the anticipated widespread use of A/C, we note that the GHG standards do exactly that (as a number of commenters, e.g. Ford, noted explicitly and correctly). See joint TSD section 2.5.3.2 (explaining how the target curves reflect use of A/C technology); preamble section III.C.3.

3.1. Credits Related to Reduced Leakage and the Use of Alternative Refrigerants

Organizations Included in this Section

Alliance of Automobile Manufacturers
Arkema Inc.
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
California Air Resources Board (CARB)
Chrysler Group LLC
Ford Motor Company
Honeywell International, Inc.
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Northeast States for Coordinated Air Use Management (NESCAUM)
Toyota Motor North America
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

The Alliance does not support additional requirements on Low Global Warming Potential (GWP) refrigerant systems (i.e., the "high leak disincentive"). Some manufacturers have invested millions of dollars to redesign their vehicles and assembly plants for transitioning to new low-GWP refrigerants. These companies have counted on a specific level of credits in exchange for making this transition earlier than they might otherwise have done. This new proposal would potentially reduce the amount of credit, unfairly penalizing early adopters. [EPA-HQ-OAR-2010-0799-9487-A1, p.5]

Use of Updated SAE J2727 [EPA-HQ-OAR-2010-0799-9487-A1, p.59]

The Alliance supports the proposed adoption of the updated SAE J2727 procedure to calculate leak rates. However, at the time the NPRM was written, the updated SAE J2727 was still in draft form. Therefore, not all of the changes have been included in the NPRM. Now that the update is nearly approved, we recommend that it be fully incorporated into the final rule. Using a lower multiplier of 10 (instead of 125) for helium tested connectors makes sense to provide lower leak rates for tighter connectors. The Alliance also proposes that this methodology, along with all other SAE J2727 updates, be allowed for MY 2012-16 so that manufacturers will be encouraged to perform helium testing as soon as possible and develop testing methods in advance. This allowance will benefit the environment and support automakers ability to earn credits to meet the challenging standards of the future. [EPA-HQ-OAR-2010-0799-9487-A1, p.59]

Use of SAE J2064 [EPA-HQ-OAR-2010-0799-9487-A1, p.59]

The Alliance supports the adoption of the SAE J2064 procedure for MY 2017 and beyond for calculating hose leak rates. The Alliance also proposes to allow this calculation method for MYs 2012-16. [EPA-HQ-OAR-2010-0799-9487-A1, p.59]

High Leak Disincentive [EPA-HQ-OAR-2010-0799-9487-A1, p.59]

The Alliance does not support the proposal to reduce the MAC direct credits (up to 1.8 g/mile for cars and 2.1 g/mi for trucks) via the "high leak disincentive" if the refrigerant leakage rate is not reduced by half from industry average leak rates (in other words, generating debits if the MAC fails to achieve the low leak standards). Compared to the MY 2012-2016 regulation, an unreduced program for MAC credits was the basis for the consensus GHG targets set for MY 2017-2025. The major reasons why the high leak disincentive should not be implemented for MYs 2017-25 and beyond for the R1234yf refrigerant are: [EPA-HQ-OAR-2010-0799-9487-A1, p.59]

1) Manufacturers have invested millions of dollars to change the designs of their vehicles and their assembly plants to bear the added cost of the new refrigerant in order to earn these credits. This new proposal to potentially reduce the amount of credit from a switch in refrigerant changes the cost-benefit equation from making this switch. This unfairly penalizes early adopters by undercutting the value derived from the credits from their decisions to switch rapidly to a new refrigerant, when a slower changeover might have been preferred under the new proposed rules. [EPA-HQ-OAR-2010-0799-9487-A1, pp.59-60]

2) EPA is proposing the high leak disincentive should be implemented for a refrigerant that has a GWP below 150. R1234yf, the new refrigerant that many auto manufacturers plan to use in this timeframe, has a GWP of 4. The global warming impact of R1234yf is 0.0028 times that of R134a. [EPA-HQ-OAR-2010-0799-9487-A1, p.60]

The actual global warming impact of an average leak air conditioner vs. a low leak air conditioner is shown in the table below, where grams/mile of CO_{2e} are calculated based on the delta between average leak and low leak. The data suggests that the actual difference in global warming impact between a vehicle with an average leak and the same vehicle with a low leak air conditioner is 0.002 g/mile for cars and 0.003 g/mile for trucks on a CO_{2e} basis using the R1234yf GWP of 4. The high leak disincentives proposed by EPA are 1.8 g/mile for cars and 2.1 g/mile for trucks, which are not in line with the actual global warming impacts. The data below suggests that, assuming manufacturers report CO_2 emissions to the nearest tenth of a g/mile so in these terms, excess CO_{2e} emissions from these average leak vehicles will be 0.0 g/mile for cars and 0.0 g/mile for trucks. This analysis shows that the "high leak disincentive " proposed by EPA has no environmental basis, due to the de minimis environmental impacts of R1234yf leakage. [EPA-HQ-OAR-2010-0799-9487-A1, p.60] [For the table please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.60]

3) Refrigerant leak rates are historically low for modern MAC systems because automobile manufacturers have improved quality in order to meet rising customer expectations and reduce warranty expenses. There is no evidence that manufacturers will be backsliding on these leak rates to save costs. In fact, given the higher cost of R1234yf - up to ten times the price of R134a -

manufacturers have an increased incentive to further reduce leaks and thereby retain the expensive new refrigerant. [EPA-HQ-OAR-2010-0799-9487-A1, p.60]

4) EPA has expressed concern about refilling R134a refrigerant in place of the R1234yf refrigerant. However, this is not easily achieved, since the service port fittings installed on new vehicles with R1234yf refrigerant are totally different from those using R134a. [EPA-HQ-OAR-2010-0799-9487-A1, p.61]

5) It is also worth noting that the size of the proposed penalty greatly exceeds the actual scale of the GHG impact of potential leakage. Please also note that the closing bracket is placed at the wrong place in the formulas that calculate direct MAC credits in section § 86.1866-12.(b)(2)(i) & (ii), both for cars and trucks. We recommend that EPA make the correction of these closing brackets (as noted below) along with removing the HiLeakDis factor in both formulas. [EPA-HQ-OAR-2010-0799-9487-A1, p.61] [For the figure '(noted below)' please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.61]

Refrigerant Level Monitoring [EPA-HQ-OAR-2010-0799-9487-A1, p.61]

Emission warranty requirements are not appropriate for mobile air conditioners under the proposed rule. This is because in-use performance of MAC systems at levels comparable to a new vehicle is not needed to achieve the emission levels targeted by EPA. [EPA-HQ-OAR-2010-0799-9487-A1, p.61]

Warranty requirements were established for tailpipe pollutants, such as CO and NO_x, because emissions of those pollutants would rise significantly if the pollution control devices such as catalytic converters fail. This would typically not be the case for MAC components. First, consider the case of indirect emissions from fuel consumed to power the MAC. In the vast majority of MAC failure modes, the system stops cooling and ceases operation - either because the critical moving parts stop moving or because the system is switched off - thereby actually reducing the indirect CO_2 emissions. [EPA-HQ-OAR-2010-0799-9487-A1, p.61]

Emission warranties should not be required in relation to the indirect MAC emissions. The most significant item in EPA’s proposed warranty coverage, the compressor, can cost over $1,000 to replace. It seems paradoxical and disproportionate to impose such high costs in an emissions recall scenario to replace this component, and thereby actually increase indirect emissions. Although manufacturer warranties may typically already be longer than the two-year period proposed by EPA in this NPRM, in principle there is no sound basis for emission warranty coverage to safeguard indirect emission levels, since indirect emissions go down when the system fails. Finally, it is worth noting that proper functioning of these parts is not actually required to achieve the emissions levels set by EPA. [EPA-HQ-OAR-2010-0799-9487-A1, pp.61-62]

Regarding direct emissions of refrigerant, there is only a negligible environmental impact if refrigerants below a GWP of 150 are released from the system, even if the entire charge (typically between 1-2 pounds) is released. Therefore, emission warranty coverage of joints, hoses, seals, etc. is certainly not needed to protect the environmental gains from application of low-GWP refrigerants. While the ultimate cost of the new low-GWP refrigerant R1234yf (also known as HFO-1234yf)) is higher than the R134a, it is expected to be at a level that would severely discourage motorists from repeatedly recharging a system with significant unrepaired leaks (e.g., any cost of over $30 per pound). Therefore, there is no emission-based reason to mandate warranty coverage to prevent leaks on low-GWP systems, and the potential costs of an emission recall would be disproportionate to any environmental impact of leakage of these refrigerants. Any emission warranty requirements should specifically exclude emission warranty coverage for systems using a refrigerant with a GWP below 150. This is consistent with EPA’s position that no emissions warranty is required for zero emissions vehicles. The sole remaining MAC environmental impact would be from refrigerant leakage in the current R134a systems. Given the prospect for fairly rapid adoption of the low-GWP refrigerants in new vehicles during the time frame of this regulation, this would appear to be a very small basis on which to create an entirely new area of emissions warranty coverage and all the associated elements of an in-use program for air conditioners. EPA should not create a program of warranty coverage for MAC components in pursuit of such a small and temporary emissions impact. [EPA-HQ-OAR-2010-0799-9487-A1, p.62]

In conclusion, a properly structured MAC credit program can provide substantial low cost, near term GHG reductions. Our recommendations are provided to make the MAC program work as effectively as possible. [EPA-HQ-OAR-2010-0799-9487-A1, p.62]

Implementation of New Alternative Refrigerants [EPA-HQ-OAR-2010-0799-9487-A1, p.62]

As part of the Single National Program, the current regulations provide incentives to manufacturers to implement low-GWP refrigerants and reduce system leakage. Our members plan to make use of these incentives, with the degree of use depending on each manufacturer's model changeover plans, MAC technology implementation plans and capital investment schedules. In fact, we expect some automobile manufacturers to begin use of R1234yf on some models as early as 2013. Despite this promising news, there remain prohibitive barriers to achieving 100% use of low-GWP refrigerants. [EPA-HQ-OAR-2010-0799-9487-A1, p.62]

At this juncture, it would be premature for EPA to remove R134a from the list of acceptable substitutes for CFC-12 in MAC systems. We believe that the key to this transition is to instead continue the credits available under the MY 2012-2016 National Program for regulation of light-duty vehicle GHG and fuel economy. This approach would help ease the transition and encourage earlier action, to the extent that such action is achievable and cost-effective. It would encourage low-leak R134a systems, so long as R134a systems are allowed on new vehicles. It would also encourage accelerated introduction of new refrigerants if manufacturers were awarded credit for any usage of the new refrigerants in excess of mandated requirements. Should R134a become prohibited and R1234yf become mandatory for all vehicle MAC systems, it is critical that the MAC credits continue to apply throughout MY 2017-25, since these credits are an essential part of manufacturers’ compliance plans. [EPA-HQ-OAR-2010-0799-9487-A1, pp.62-63]

Refrigerant Availability [EPA-HQ-OAR-2010-0799-9487-A1, p.63]

Based on current knowledge, the best product that could meet a low-GWP requirement (at or below 150 GWP) would be R1234yf. This refrigerant is not yet available in commercial quantities, and it is unclear when a sufficient supply will be available in for the U.S. market or what the cost of this product will be. [EPA-HQ-OAR-2010-0799-9487-A1, p.63]

The single manufacturer of R1234yf – a joint venture of Honeywell and DuPont – recently announced that it would begin supplying the refrigerant in commercial quantities in the fourth quarter of 2012. According to current information, once production is permitted at pilot facilities at both Honeywell and DuPont, as well as an intermediate-scale facility in China at DuPont affiliate Changshu 3F Zhonghao New Chemical Materials, supplies likely will meet near-term EU requirements. A single world-scale plant is expected to follow at an undefined later date as demand grows. [EPA-HQ-OAR-2010-0799-9487-A1, p.63]

Current EU regulations mandate that automakers switch to low-GWP refrigerants by 2017. This EU mandate was phased in over a seven year period beginning in 2011. EU sales of nine million MAC-equipped vehicles filled with 600 grams of refrigerant equate to 5400 metric tons of refrigerant required for new production. Service and repair will require additional refrigerant. Since these regulations are already in place, the ramp-up of R1234yf production and system design is expected to fill the EU market first. The supply challenge is exacerbated by the fact that Honeywell and DuPont retain exclusive rights to the manufacture of R1234yf, thereby limiting the opportunity for other chemical manufacturers to supply the future demand for added manufacturing capacity. [EPA-HQ-OAR-2010-0799-9487-A1, p.63]

Engineering Resources Needed to Transition to R1234yf [EPA-HQ-OAR-2010-0799-9487-A1, p.63]

In evaluating this issue, the agencies should consider both the availability of the new refrigerant and the significant automaker resources needed to provide the engineering, logistics, training and roll-out. The deployment of these changes over 100% of vehicle models will present considerable challenge. In particular, all new systems will require complete revalidation using the new lubricants required for R1234yf. This will take time and strain the engineering resources throughout the MAC industry. [EPA-HQ-OAR-2010-0799-9487-A1, p.63]

In most cases, manufacturers will implement R1234yf with a revised component layout, including additional components that create packaging problems. Therefore, R1234yf is ideally implemented during vehicle major redesigns. Finally, there are significant changes to the assembly plants that are required to handle R1234yf (especially OSHA rules). These typically include relocation of the refrigerant charging area and relocation of refrigerant storage tanks. Extensive plant rearrangements such as this are very disruptive to plant operations, and are therefore typically performed as part of the changeover that occurs when new models are introduced, when extensive replacement of tooling and revised layout of production lines is typically required throughout the plant. [EPA-HQ-OAR-2010-0799-9487-A1, p.64]

Substituting R1234yf for R134a is fundamentally more complex than the change from R12 to R134a that was made during the 1990's, and the SNAP usage requirements are more significant.

The changes in the assembly plants will also be much more significant than were the case for R134a. [EPA-HQ-OAR-2010-0799-9487-A1, p.64]

For these reasons, EPA should not delist R134a from the approved SNAP list of automobile air conditioner refrigerants, nor should EPA establish other policies based on the assumption that a comprehensive changeover to new refrigerants can occur within the foreseeable future. [EPA-HQ-OAR-2010-0799-9487-A1, p.64]

Organization: Arkema Inc.

Arkema supports the EPA's focus on the use of more advanced components and technology to reduce the potential for refrigerant leakage and/or the use of alternative refrigerants. In fact, Arkema was and is an important contributor to the efforts to develop methods for leak-tight components and has an interest in the production of HFO-1234yf and/or other alternative refrigerants. The option of using air conditioning credits and the flexibility to choose leak-tight components or an alternative refrigerant should remain in the final rule. This choice gives flexibility to auto manufacturers, allows prioritization of improvements in vehicles, and acknowledges technological advancements that some auto manufacturers may have already implemented. For the consumer, the end result is the choice of the newest technology which could foster higher acceptance. Finally, for example, Arkema supports proper cooling load management to optimize the sizing of an air conditioning unit in motor vehicles. [EPA-HQ-OAR-2010-0799-9468-A1, p.2]

Arkema supplies a number of products into the automotive industry, which will help auto manufacturers achieve the proposed requirements. From coatings, refrigerants, plastics, polymers, and resins, Arkema serves a number of automobile parts suppliers and manufacturers to foster technological advancements for motor vehicles. [EPA-HQ-OAR-2010-0799-9468-A1, p.2]

However, as EPA considers which alternative refrigerants are eligible for use in mobile air conditioning systems, we believe that each potential, new refrigerant should be evaluated in terms of its full costs and benefits and effects on health, safety and the environment. Additional evaluation and information based on the above factors should be included in the final rule regarding alternative refrigerants. In addition, as alternative refrigerants play a key role in EPA's proposal, it is necessary to also more fully consider the availability, supply and competitiveness of such alternative refrigerants. Although potential supply issues are acknowledged in the NPRM, in light of other international regulatory efforts such as those previously undertaken by the European Union, for example, we believe additional analysis is needed by EPA to understand the potential costs and implications that could be posed by an adequate global supply of alternative refrigerants. Thus, a discussion on the acceptance of alternative refrigerants on a global scale should be included to benchmark other efforts in this area. EPA may also wish to consider delaying the use of alternative refrigerant incentives until relevant health, safety, environmental and supply issues can be fully and properly analyzed and/or until the mid-term evaluation process envisioned by the proposed rule. [EPA-HQ-OAR-2010-0799-9468-A1, pp.2-3]

c. Market Penetration of Alternative Refrigerants is the Best Way to Manage Existing Products [EPA-HQ-OAR-2010-0799-9468-A1, p.3]

Arkema supports EPA's proposed method of managing the transition to a new refrigerant as long as the use of particular refrigerants is not mandated by EPA and the market players have freedom of choice. This will ensure that there is adequate supply of the products and that the products will operate in a competitive marketplace. If the North American Proposal for HFCs (HFC Amendment to the Montreal Protocol) is successful, HFCs would be managed on a global cap and trade allocation basis and could still allow room for the market to govern the selection of materials. [EPA-HQ-OAR-2010-0799-9468-A1, pp.3-4]

EPA's potential Significant New Alternatives Policy (SNAP) rulemaking on HFC-134a is not consistent with the proposed method above or the HFC Amendment. The potential SNAP rulemaking to potentially de-list HFC-134a manages the process on a chemical by chemical basis and makes EPA the market regulator while the HFC Amendment allows competitive forces to make choices. [EPA-HQ-OAR-2010-0799-9468-A1, p.4]

Organization: Association of Global Automakers, Inc. (Global Automakers)

B. Availability of HFO-1234yf

As EPA is aware, manufacturers have been evaluating alternative refrigerants with low global warming potential (GWP) for many years. HFO-1234yf has emerged as a potential alternative that has the potential to be used in new vehicles in the near term. [EPA-HQ-OAR-2010-0799-9466-A1, p. 4]

However, while the outlook for the use of HFO-1234yf is promising, the availability of HFO-1234yf is still highly uncertain. With only two manufacturers and only one plant to produce this refrigerant at this time, there is not yet a guarantee that there will be adequate supplies for the U.S. vehicle market, especially since the European Union is moving ahead to adopt alternative refrigerants prior to the U.S. As part of the determination of the GHG standards, EPA accounts for the expected use of HFO-1234yf, and therefore the likely credits that would be obtained from this use, expecting 100% usage prior to 2025. The GHG standards were developed with these potential credits in mind. If for some reason HFO-1234yf does not reach commercialization, or adequate supplies are not available for all vehicle manufacturers, then it will be necessary for EPA to reassess the GHG standards, taking into account that a 100% usage rate will not be met. Global Automakers recommends that EPA continue to track the progress for HFO-1234yf and reevaluate the potential for 100% usage as part of the mid-term review. Again, if 100% usage is not feasible, then EPA should account for this shortfall through a revision of the standards following the mid-term review. [EPA-HQ-OAR-2010-0799-9466-A1, p. 5]

Organization: BMW of North America, LLC

From our point of view, the adequate availability of HFO-1234yf is highly questionable. Therefore, we greatly appreciate EPA's decision regarding the future ;:Adoption of this refrigerant. Currently, no one knows when the supply will be adequately established in the market. To assure that automakers will be able to continue to offer air conditioning to consumers in the future, the delisting of HFC-134a as an approved substitute would not be prudent at the present time. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 1]

Regarding leakage-related credits, we would like EPA to reconsider the so called 'Hi Leak Disincentive.' SAE J639 specifically requires unique service fittings for each refrigerant to prevent both accidental cross-contamination and intentional tampering by service technicians, and EPA's regulations currently do not allow the use of any unintended fluid or refrigerant in any A/C system. If someone does so, then it would violate the law. So the effects of illegal refrigerant charge cannot be influenced by the manufacturer. Furthermore, this disincentive provokes discussions to use unintended refrigerants. We do not expect that vehicle manufacturers will shift to higher potential leakage rates when using HFO-1234yf instead of HFC-134a; BMW would definitely not do so and our focus will remain on best quality refrigerant circuit tightness for any given refrigerant. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 2]

Organization: California Air Resources Board (CARB)

The California Air Resources Board (CARB) is supportive of the general structure of the motor vehicle air conditioning (AC) leakage credit program in the proposed United States Environmental Protection Agency (U.S. EPA) 2017-2025 MY light-duty vehicle greenhouse gas (GHG) rule. We believe the program will continue leading the automotive industry toward a more sustainable future by incentivizing the use of new refrigerants with low climate impact and superior refrigerant containment technologies. In the meanwhile, we have three specific comments on the U.S. EPA AC leakage credit provisions. The purpose of these comments is to accomplish three things:

- Correcting what appears to be an unintentional error in U.S. EPA’s proposed AC leakage credit formulas,
- Aligning U.S. EPA’s AC leakage credit formulas with the broad intent of the rule, and
- Fully aligning the U.S. EPA regulation and the CARB regulation with respect to AC leakage credit provisions.

The three specific comments are described in the attachment. [EPA-HQ-OAR-2010-0799-9491-A1, p. 1]

Attachment. Specific Comments on AC Leakage Credit Provisions in U.S. EPA’s 2017-2025 MY Light-duty Vehicle GHG Rule

Comment 1 refers to portions of subsections (i) and (ii) in §86.1866-12(b)(2). [EPA-HQ-OAR-2010-0799-9491-A1, p. 3]

Comment 2 refers to portions of subsections (i) and (ii) in §86.1866-12(b)(2). [EPA-HQ-OAR-2010-0799-9491-A1, p. 4]

Comment 3 refers to portions of subsections (i) and (ii) in §86.1866-12(b)(2). [EPA-HQ-OAR-2010-0799-9491-A1, p. 5]

[See pp. 3-7 of Docket number EPA-HQ-OAR-2010-0799-9491-A1 for specific comments on AC Leakage Credit Provisions.]

Organization: Chrysler Group LLC

The updated SAE J2727 and J2064 procedures and their bearing on EPA air conditioning system leakage calculations;

Opposition to EPA's proposed "high leak disincentive";

Refrigerant level monitoring;

And low-global warming potential ("GWP") refrigerant availability and the resources necessary to transition from R-134a systems to Low-GWP refrigerants. [EPA-HQ-OAR-2010-0799-9495-A1, p. 10]

Organization: Ford Motor Company

Ford also supports the continuation of the existing A/C leakage credit opportunities and offers the following comments about the proposed program for 2017-2025 MYs. [EPA-HQ-OAR-2010-0799-9463-A1, p. 14]

We believe that the current design-based "menu" approach to quantifying leakage credits is effective and should be retained. We also agree with EPA's proposal to adopt the latest version of SAE J2727 for calculating leak rates, including the lower multiplier for helium tested connections as well as all other updates incorporated into the SAE standard at the time the final rule is published. In addition, Ford supports the adoption of the hose permeation rates calculated from SAE J2064 as part of SAE J2727. For consistency and to encourage helium leak testing, we propose that EPA also allow these updated methodologies to be used for 2012-2016 MY vehicles. [EPA-HQ-OAR-2010-0799-9463-A1, p. 14]

Ford supports the mechanisms in place to incentivize the introduction of new low global warming potential (GWP) refrigerants, such as R-1234yf. Use of such refrigerants directly reduces the climate effects of A/C system leakage. As detailed in the Alliance comments and the NPRM preamble, there are still a number of obstacles that must be overcome before new low-GWP refrigerants can be used widely throughout the industry. These include, but are not limited to, refrigerant availability and cost, required A/C system hardware updates and testing, and assembly plant facility upgrades. Nonetheless, manufacturers are working to pursue this as a viable option to directly reduce GHG emissions in the future. Ford believes appropriate credit levels must continue through 2025 MY in order to incentivize the introduction of these new refrigerants. [EPA-HQ-OAR-2010-0799-9463-A1, p. 14]

Related to credit amounts, Ford does not support the introduction of the “high leak disincentive” proposed in the 2017-2025 MY program for low-GWP refrigerants. This revision makes it impossible for manufacturers to obtain the maximum leakage credit amounts for these refrigerants, unless they implement a system that achieves the minimum leakage score. Credits may be reduced by as much as 1.8 g/mile for cars and 2.1 g/mile for trucks. As detailed in the Alliance comments, Ford does not believe that the introduction of R-1234yf will encourage backsliding on leakage rates. Retention of the new, more costly refrigerant should serve as an incentive to improve or maintain leakage levels. We also have no indication that customers will commonly choose to recharge with R-134a or higher-GWP refrigerants. As required by the SNAP rule and SAE J639, we will engineer our systems and port fittings to avoid the possibility of this occurring. Finally, we do not believe it is appropriate to introduce a disincentive that would impact all systems that do not achieve the minimum leak score. This goes above and beyond the goal of discouraging backsliding and significantly infringes on manufacturers’ ability to obtain the full benefit of introducing low-GWP refrigerants. To encourage implementation of the new refrigerants, Ford recommends that the “high leak disincentive” be removed from the leakage credit equations. If such a “disincentive” value is retained, Ford believes the score levels used in the equation to calculate the value should be re-evaluated to ensure that it accomplishes the stated goal of minimizing backsliding. [EPA-HQ-OAR-2010-0799-9463-A1, pp. 14-15]

Outside the scope of this NPRM, we understand that a petition has been filed and separate regulatory workstreams are in process to potentially remove the current predominant refrigerant, R- 134a, from the list of acceptable substitutes for CFC-12 in mobile A/C systems. Due to the impediments to R-1234yf introduction described above, Ford does not support efforts to delist R-134a. Should R-134a be delisted for new vehicles, or R-1234yf become required in the future, the credit opportunities for low-GWP refrigerants should remain in place through 2025 MY. In determining the stringency of the GHG standards, EPA assumed manufacturers would make widespread use of the alternative refrigerant credits (especially during the later years of the program). Therefore, this incentive opportunity must continue through the duration of the entire 2017-2025 MY rule. Ford believes that removal of this flexibility would necessitate a modification to the overall stringency of the GHG targets. [EPA-HQ-OAR-2010-0799-9463-A1, p. 15]

Organization: Honeywell International, Inc.

Continuation of the A/C Credit Program beyond 2016 will accelerate the transition to low global warming potential ('GWP') refrigerant technologies and provide clear market signals to manufacturers as they incorporate cleaner technologies into their vehicles. [EPA-HQ-OAR-2010-0799-9497-A1, p.3]

The A/C Credit Program offers a valuable tool to comply with the fleet-wide CO_2 emission requirements and corporate average fuel economy standards by providing vehicle manufacturers with the flexibility necessary to continue to move ahead on a specific compliance pathway. [EPA-HQ-OAR-2010-0799-9497-A1, p.3]

Innovation means investment. In response to the European Union's call for a more environmentally friendly refrigerant for cars, Honeywell's team of world-class scientists launched an accelerated effort to develop a next generation air conditioning refrigerant. The result: Solstice™ 1234yf, a product that not only exceeded the goals set politically, but one that represents a long-term, global, and energy-efficient solution. [EPA-HQ-OAR-2010-0799-9497-A1l, p.3]

EPA and NHTSA properly acknowledge that the large number of light duty vehicles with A/C in use today has a substantial impact on the amount of energy vehicles consume and on the amount of refrigerant leakage that occurs due to their 'significant use.' With forecasts predicting more than 90 million light vehicles to be built per year by 2019, Solstice™ 1234yf mobile refrigerant can serve as an important component in global climate protection. [EPA-HQ-OAR-2010-0799-9497-A1, p.4]

With the development of Solstice™ 1234yf refrigerant, Honeywell is investing in making modern life more comfortable, cost- and energy efficient, and safer. [EPA-HQ-OAR-2010-0799-9497-A1, p.4]

Honeywell supports EPA's proposal to continue to allow auto manufacturers to generate credits for employing technologies that reduce A/C leakage emissions ('Leakage Credits') that may be used for compliance with vehicle emissions standards. The Leakage Credit program can be improved upon and Honeywell offers recommendations for EPA to incorporate the best available science in its analysis of average leak rates across the life of a vehicle. [EPA-HQ-OAR-2010-0799-9497-A1, p.4]

EPA explains that its proposed Leakage Credit is based on the SAE 12727 method. This standard does not adequately reflect leakage over the lifecycle of the vehicle. In the Draft Joint Technical Support Document ('TSD'), EPA states that it considers SAE J2727 to be an appropriate method for quantifying the expected yearly leakage rates from A/C systems, despite EPA's recognition that SAE 12727 is a 'surrogate for in-use emissions' and is 'not necessarily an accurate representation of real-world emissions Honeywell agrees that the test is appropriate for calculating leakage from new, properly constructed vehicles, but this test fails to account adequately for the increased leakage as vehicles age. [EPA-HQ-OAR-2010-0799-9497-A1, p.5]

Several recent studies indicate that emissions rates in older vehicles are much greater than the J2727 scores represent. For example, one study found that the average leakage rate of mobile A/C systems that are 1 to 6 years old is 52.4 g/year ± 4.6 g/yr. Another indicates that new compressors leak at a rate between 5 and 40 g/year and that aged compressors leak at rates from 97 to 1800 g/year when pressurized with refrigerant.[EPA-HQ-OAR-2010-0799-9497-A1, p.5]

Given that SAE 12727 does not account fully for leakage of refrigerants over the life of a vehicle, Honeywell proposes that companies seeking to obtain leakage credits be allowed the opportunity to design a component test based on SAE Standard 12763, Test Procedure for Determining Refrigerant Emissions from Mobile Air Conditioning Systems. Honeywell suggests that the use of SAE Standard 12763 test protocols provides a true indication of the correct selection of leakage reduction components and also allows for the development of additional credit goals for manufacturers to reduce the overall leakage rate. [EPA-HQ-OAR-2010-0799-9497-A1, p.5]

Honeywell is committed to put in place capacity in the United States to produce Solstice™ 1234yf consistent with the requirements of the US automobile manufacturers to meet GHG emission and fuel economy standards in the current regulations and the Proposed Rule. [EPA-HQ-OAR-2010-0799-9497-A1, p.5]

Compared to other alternative refrigerants referenced in the Proposed Rule, Solstice™ 1234yf has the most favorable climate footprint over its entire life cycle, and transition to Solstice™ 1234yf will require relatively few changes to existing air conditioning systems. [EPA-HQ-OAR-2010-0799-9497-A1, p.5]

Solstice™ 1234yf refrigerant has a 99.7 percent lower global warming potential than R134a (4 versus 1430) and breaks down and disappears from the atmosphere within 11 days compared to the 13 years that R134a stays in the environment. [EPA-HQ-OAR-2010-0799-9497-A1, p.5]

A major part of a refrigerant's global warming potential is due to indirect emissions: CO_2 emissions, caused by increased fuel consumption needed to power the air conditioning system. NC systems using Solstice™ 1234yf refrigerant generally burn less fuel than other low GWP technologies. For example, air conditioners equipped with Solstice™ 1234yf refrigerant use markedly less fuel and produce 20 to 30 percent fewer emissions than CO_2 used as a refrigerant in hot climate zones. These efficiencies offer OEMs additional benefit in meeting the underlying fuel economy standards in the Proposed Rule. [EPA-HQ-OAR-2010-0799-9497-A1, p.6]

Adoption of Solstice™ 1234yf will require few changes to existing NC systems. The operating system pressures of Solstice™ 1234yf are similar to the most popular current refrigerant, R134a. This allows for re-use of the recent manufacturing technology advancements that will continue to make NC systems affordable into the next generation of Solstice™ .1234yf refrigerant systems. Conversely, CO_2 A/C systems require completely new equipment designs that would require significant investment in resources to implement. [EPA-HQ-OAR-2010-0799-9497-A1, p.6]

In the Proposed Rule, EPA and NHTSA generally provide a clear and appropriate process for alternative refrigerants with low GWPs to qualify for credits that may be used by OEMs for compliance with GHG emission requirements. The agencies also present some plausible scenarios for the transition toward commercialization and broad market acceptance of alternatives to the status quo refrigerant, R134a. Honeywell appreciates and supports the Proposed Rule's recognition of the dual benefits of alternative refrigerants in meeting our climate change and energy independence objectives and the incentives to enable the transition to low GWP refrigerants. [EPA-HQ-OAR-2010-0799-9497-A1,p.6]

Honeywell Agrees with EPA's Leakage Credit Equation to Determine the Net Fleet Effect of Direct Emission Due to Refrigerant Leakage.

Honeywell supports the continuation of credit opportunities for low leakage technologies and suggests that to the maximum extent possible the credit program should reflect accurately leakage rates in vehicles over time. As vehicles age, the following conditions cause leakage rates to increase: seasonal, daily, and in operation thermal cycles; vibrations; hardening of hoses and o-rings; drying out of the shaft seal due to non-operation (or continuous operation for clutchless models); collisions; service (engine or mobile A/C system); and corrosion leaks. [EPA-HQ-OAR-2010-0799-9497-A1, p.6]

Honeywell agrees that the assumed emissions leakage rates of 16.6 and 20.7 g/year are representative of refrigerant emission rates for new motor vehicle A/C systems. Honeywell also concurs that the MaxCredit term reflects a correct order of magnitude to account for fleet aging through the vehicle lifetime. Last, Honeywell agrees that the GWP Refrigerant term accounts for the GWP impact of alternative refrigerants compared to the current R134a refrigerant, which has a GWP of 1430. In sum, Honeywell concurs with EPA's emission equation to determine the net fleet effect of direct emissions due to refrigerant leakage. [EPA-HQ-OAR-2010-0799-9497-A1, pp.6-7]

EPA HiLeakDisincentive Term Is Not the Best Approach to Prevent Against Backsliding to Higher GWP Refrigerants and Increase GHG Emissions During Ale System Retrofit and Recharge.

EPA proposes to add to the existing credit calculation a HiLeakDisincentive term with the intention of preventing GHG emissions from systems designed to operate on low GWP refrigerants but which potentially could be recharged with a higher GWP refrigerant. This method is neither effective nor appropriate for two reasons: it provides an advantage to high GWP refrigerants and it raises the cost of credits far vehicle manufacturers without delivering demonstrated GHG emissions or fuel economy improvement. [EPA-HQ-OAR-2010-0799-9497-A1, p.7]

First, if the HiLeakDisincentive term is to account for the loss of efficiency as systems leak, then it should apply to all refrigerants and not just refrigerants with a GWP less than 150. EPA proposes that the HiLeakDisincentive term for refrigerants with a GWP higher than 150 will automatically be zero, regardless of the A/C system's efficiency. Conversely, for lower GWP refrigerants, EPA proposes that the term account for A/C system efficiency loss due to leakage. Honeywell argues that the disparate treatment of low GWP refrigerants compared to high GWP refrigerants for purposes of the HiLeakDisincentive term is inequitable because both high and low GWP refrigerant systems sustain some amount of leakage before system performance is affected. [EPA-HQ-OAR-2010-0799-9497-A1, p.7]

SAE Standard 12765:2008 provides a chart, shown below, that demonstrates this point. Conventional systems such as R134a and future systems that utilize low GWP fluids in subcritical system design both have optimum charge plateaus, representing a range of refrigerant charges where system efficiency is largely independent from system refrigerant amount. Typically, auto manufacturers will charge to the right side of the plateau to allow for some system leakage before system efficiency is affected. Although the chart below represents a theoretical bench top system, it demonstrates that a charge amount of nearly 400 grams may be lost before the leakage affects system efficiency. [EPA-HQ-OAR-2010-0799-9497-A1, p.7]

The HiLeakDisincentive term should account for this standard leakage, regardless of the refrigerant's GWP. Honeywell recommends that EPA either remove the default value of zero for refrigerants with GWP higher than 150 or raise the MaxCredit term by an equal amount for refrigerants with a GWP lower than 150. Unfortunately, subcritical systems for CO_2 do not have a charge plateau, and system efficiency correlates directly with refrigerant leakage. Consequently, the performance loss disincentive for these systems should be based on the science of the system design, rather than a set term.

Second, EPA's proposed HiLeakDisincentive term will raise production costs for vehicle manufacturers without reciprocal GHG benefits, penalizing them for the potential actions of others without creating any additional efficiency. In order to avoid the HiLeakDisincentive penalty in the credit calculation, OEMs must not only purchase more costly low GWP refrigerants, but also the more expensive high-efficiency components. One of the strengths of the current A/C Leakage Credit system is that it provides OEMs with flexibility to meet fleetwide GHG emission requirements. [EPA-HQ-OAR-2010-0799-9497-A1, p.8]

The high efficiency components will only render a meaningful fuel savings if the vehicle owner and repair shop chooses to recharge the vehicle with a low GWP refrigerant. Honeywell believes that the regulations should not penalize OEMs for decisions that they are unable to control, such as recharging and retrofitting A/C systems. Instead, Honeywell proposes to collaborate with EPA and NHTSA to develop an alternative mechanism to prevent backsliding, including providing certain incentive for recharging with low GWP refrigerants, discussed further in Part IV. [EPA-HQ-OAR-2010-0799-9497-A1, p.8]

Anti-Backsliding

As discussed in Part II.B., above, the use of low GWP refrigerants brings new challenges in developing regulations to prevent backsliding to a higher GWP refrigerant during recharging of a low GWP refrigerant system. EPA and NHTSA acknowledge in the Proposed Rule that repeated recharging of A/C systems could lead some consumers and/or repair facilities to recharge a s1stem designed for use with a low GWP refrigerant with a cheaper high GWP refrigerant. Unfortunately, EPA and NHTSA have not set out a strong enough legal case to assure against such backsliding. [EPA-HQ-OAR-2010-0799-9497-A1, p.11]

The agencies' statement that 'recharging with a refrigerant different from that already in the A/C system is not authorized under current regulations' is not correct. Per the authority granted to EPA under Section 612(c) of the Clean Air Act, the Significant New Alternatives Policy (SNAP) Program, it may identify acceptable and unacceptable substitutes for ozone-depleting substances, including R-12 (Freon). The SNAP program has identified alternatives to R-12 and has granted them New system (with or without restriction) or Retrofit (with or without restrictions) status. The common refrigerant R -134a is now the focus of the instant rulemaking. SNAP granted R-134a both New and Retrofit status for R-12 for its automotive application, including the use restriction that the vehicle charging ports should be modified to allow technicians to service that vehicle once a retrofit has been carried out. [EPA-HQ-OAR-2010-0799-9497-A1, p.11]

SNAP has only granted HFO-1234yf new system status, with certain restrictions regarding proper vehicle design for the use of a mildly flammable refrigerant, as a replacement to R-12 systems. The SNAP program has not granted Retrofit status to HFO-1234yf because of the design practices of current R-134a systems and do-it-yourselfer ('DIYer') use of the product is the subject of current and active judicial matters. One may argue that SNAP approved HFO-1234yf as a replacement for R-134a and not R-12 and thus that new vehicles using HFO-1234yf cannot be recharged with R-134a. As such, SNAP's approval of HFO-1234yf would not have been necessary because R-134a is not an ozone depleting substance and SNAP would not have had to exercise its authority under the Clean Air Act to name its acceptable substitutes. Thus, because they are both acceptable substitutes for R-12, the reverse retrofit of a system designed and filled by a vehicle manufacturer with HFO-1234yf and recharged by a service garage or DIYer with R-134a may be considered a legal conversion. [EPA-HQ-OAR-2010-0799-9497-A1, pp.11-12]

Given that lack of existing legal mechanisms to prevent against backsliding to higher GWP refrigerants during retrofit and recharge, we support regulatory measures that protect against reverting to higher GHG emissions over the life of a vehicle. We recommend that EPA and NHTSA provide incentives for the aftermarket industry to assure use of compliant, low GWP refrigerants. [EPA-HQ-OAR-2010-0799-9497-A1, p.12]

In sum, Honeywell supports, and is willing to assist, EPA and NHTSA in developing a clear and appropriate approach to assure the use and maintenance of low GWP refrigerants in the aftermarket. [EPA-HQ-OAR-2010-0799-9497-A1, p.12]

Honeywell appreciates EPA's and NHTSA's recognition of the meaningful contribution that refrigerants like Solstice™ 1234yf offer to carmakers to comply with the Proposed Rule's GHG emission and fuel economy requirements throughout the life of the program. Assuring a rapid and smooth transition to low GWP refrigerants such as Solstice™ 1234yf will deliver comparable cooling in all climates while saving time, costs, and environmental impact for years to come. Solstice™ 1234yf will serve as a valuable tool for automakers to achieve the GHG emissions and fuel economy requirements while advancing our nation's clean energy and environmental objectives. [EPA-HQ-OAR-2010-0799-9497-A1, p.12]

Solstice™ 1234yf will contribute significantly to the US economy throughout the life of the Proposed Rule. Honeywell is committed to put in place capacity in the United States to produce Solstice™ 1234yf consistent with the requirements of the US automobile manufacturers to meet GHG emission and fuel economy standards in the current regulations and the Proposed Rule. Building this new capacity will create large numbers of construction, engineering, and manufacturing jobs. In addition, plants like a Solstice™ 1234yf facility typically require significant local contractor support for maintenance and other ancillary services and create substantial indirect employment in the local community. [EPA-HQ-OAR-2010-0799-9497-A1]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 207-210.]

Organization: Hyundai America Technical Center

HFO-1234yf: EPA has specifically requested comment on the implications for a market transition to the new HFO-1234yf refrigerant and the factors that may affect the industry demand for refrigerant in the U.S. and internationally. Hyundai agrees with EPA that while the technology is very promising, there is uncertainty as to the widespread availability of HFO-1234yf. Hyundai believes the A/C credits for HFO-1234yf create an incentive to move toward this refrigerant and a phase-out of HFC-134a will ultimately be unnecessary. The uncertainty of the availability of HFO-1234yf coupled with a phase-out of HFC-134a could create a market distortion. However, Hyundai is not opposed to phasing-out HFC-134a once there is full-scale availability of HFO-1234yf and recommends that the agencies wait until this time to take any action. [EPA-HQ-OAR-2010-0799-9547-A1, p.6]

There is a minor typographical error in the calculation of leakage credit on pages 76 FR 75373 & 75374. The closing bracket is missing in the calculation. We believe the calculation should read as follows with the red bracket in the correct position: [EPA-HQ-OAR-2010-0799-9547-A1, p.8]

Leakage Credit =MaxCredit x [1-(leakScore/16.6)x(GWPref/GWPHFC134a)]-HileakDis [EPA-HQ-OAR-2010-0799-9547-A1, p.8]

Organization: International Council on Clean Transportation (ICCT)

A/C alternative refrigerant credits

The ICCT supports the agencies' proposal to issue credits for alternative refrigerants, which can dramatically reduce the potential for greenhouse gas emissions from servicing, leaks, and end-of-life disposal. We commend EPA for tying the leakage credit to the refrigerant being used in the vehicle. A flat leakage credit would have potentially overstated or underestimated the climate benefit of the intervention, depending on the refrigerant contained in the vehicle. We also commend EPA for including a disincentive for systems that utilize a low GWP refrigerant but do not also adopt low leakage equipment. [EPA-HQ-OAR-2010-0799-9512-A1, p. 39]

We also agree with US EPA and NHTSA that the credits should account for the possibility of dropping in higher GWP refrigerant such as HFC-134a (GWP 1430) as a replacement for 1234f in use.[69] This potential for backsliding is not fully addressed in the proposed rule. High prices for alternative refrigerants will very likely encourage vehicle owners to use lower cost but higher GWP replacements. EPA estimates that 49 percent of direct refrigerant leakage occurs during servicing and maintenance and nine percent occurs during end of life. This suggests the possibility for continued release of these higher GWP refrigerants, particularly among poorly maintained vehicles. Meanwhile, EPA assumes in its credit calculation that low GWP refrigerant will be used throughout the full life of the vehicle. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 39-40]

To address this concern in part, EPA has proposed to reduce the eligible credit available to the manufacturer when low-leak hoses and valves are not incorporated into the system (p 75002). While we strongly support this proposed anti-leak credit and agree that it may reduce the rate of servicing and maintenance, we remain concerned that poorly maintained vehicles or 'super emitters' will be re-charged with high GWP refrigerant and contribute substantial emissions over the course of the vehicle life. [EPA-HQ-OAR-2010-0799-9512-A1, p. 40]

The ICCT recommends that the credit be further modified to reflect the likelihood of the use of higher GWP refrigerant. Currently, the credit assumes that low GWP refrigerants will be used throughout the life of the vehicle, such that accidental releases during service events and disposal will be releases of only low GWP refrigerant. EPA should instead assume this only for systems where manufacturers demonstrate designs that cause the system to fail to operate when recharged with higher GWP refrigerants. [EPA-HQ-OAR-2010-0799-9512-A1, p. 40]

EPA should require manufacturers to demonstrate applicability to this criterion. When the criterion isn't met, EPA should reduce the amount of the credit to a level that represents only the share of total refrigerant consumption represented by the first initial charge of a new vehicle.

This approach may only apply to HFO 1234yf at the moment, since HCF-134a is essentially a drop-in replacement. Other systems like HFC-152a and CO_2 may not suffer this weakness. For HFO 1234yf, automakers would receive credit only for the refrigerant they put in the vehicle. [EPA-HQ-OAR-2010-0799-9512-A1, p. 40]

In our view, it is not enough to say that SAE design standards are being met. Additional measures are needed to encourage chemical manufacturers and auto manufacturers to find solutions that will more reliably deliver climate benefits. Such measures could be patterned after the requirements for approval of low viscosity and low friction oils for vehicle testing.[71] In this way, EPA would further ensure that design and operational limitations adopted by manufacturers fully realize the A/C emission reduction credits. [EPA-HQ-OAR-2010-0799-9512-A1, p. 40]

Credit Continuity with 2012-2016 Final Rule

EPA describes in the draft TSD that: [EPA-HQ-OAR-2010-0799-9512-A1, p. 40]

EPA made the policy decision to maintain continuity with the 2012-2016 FRM analysis, and is proposing to incorporate this level of the credit in the standard setting process. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 40-41]

This was done despite new information that suggests a need to revise the emissions inventory and the leakage credits derived from this. The reason for continuing the previous leakage credits is:

'A reduction in A/C credits would artificially increase the stringency of the standard for those manufacturers who generated leakage credits in 2016 ... alternatively, the stringency of the 2017 standards would have to be relaxed.' '...need for stability for the standards...'. [EPA-HQ-OAR-2010-0799-9512-A1, p. 41]

We understand the need for stability of the standards for those manufacturers who generate leakage credits in 2016. However, the proposed rule acknowledges that the credits do not represent the emission reductions they are designed to represent. We strongly urge that this approach be re-evaluated in order to provide manufacturers who generate leakage credits in 2016 a means to generate alternative emission reductions equivalent to those represented by the credits based on the latest understanding of the emissions inventory. [EPA-HQ-OAR-2010-0799-9512-A1, p. 41]

We are concerned that the proposed policy may stimulate manufacturers to pursue these credits more aggressively as a means to avoid on-cycle reductions. We recommend that staff quantify the differences between a revised leakage credit based on a revised TAR inventory, and the credits being proposed, so as to justify the continuation of the existing leakage credits. If the differences are considerably larger, we recommend reconsideration of the proposed credits. But if they are small, then it is justifiable to maintain the credits as is. [EPA-HQ-OAR-2010-0799-9512-A1, p. 41]

Lead Time for Low-GWP Refrigerant Penetration

EPA assumes a long lead time for penetration of low GWP refrigerants, claiming that automakers expect a full re-design to be necessary. However, automakers in Europe are already selling vehicles with low GWP refrigerant. For example, EPA assumes 20 percent penetration in 2017, while Europe will be requiring 100 percent penetration that year. In addition, some refrigerant options like 1234yf require only minor changes to the refrigerant system. EPA cites confidential discussions with vehicle manufacturers who say 'it may be possible to modify the hardware for some alternative refrigerant systems between redesign periods.' Thus, the ICCT strongly recommends harmonization with the European rule. At a minimum, EPA should explain its expectation of 20 percent penetration in 2017 and 20 percent additional penetration in each subsequent year through 2021. We feel the long lead time is unjustified and recommend that EPA expect full adoption of low GWP refrigerant along a more accelerated time frame. [EPA-HQ-OAR-2010-0799-9512-A1, p. 41]

Refrigerant OBD Monitoring

In its 2012-2016 rulemaking, EPA considered additional leak credits for systems that monitor refrigerant charge on-board the vehicle, but these ultimately were not adopted. EPA is again opening the door to this type of monitoring, considering that most A/C systems contain sensors that detect low refrigerant pressures. The ICCT would be supportive of a refrigerant OBD monitoring credit in principle, although it would be challenging to accurately model and estimate the emissions benefits of OBD monitoring. Despite this, we think providing such information to the vehicle owner would cause many owners to seek repair and maintenance of the A/C system. In light of the potential benefits and the difficulty in estimating a credit, the ICCT recommends that EPA require such on-board monitoring. Another approach might be to estimate the proportion of time that owners would have the A/C system repaired in response to a Malfunction

Indicator Light (MIL) illumination and multiply this percent by the calculated amount of leakage used for other A/C refrigerant credits. [EPA-HQ-OAR-2010-0799-9512-A1, p. 42]

Vehicles without air conditioning

The proposed crediting system is designed to mitigate the rather significant climate impacts of the air-conditioning unit, based upon both its efficiency and its refrigerant emissions. Based on this perspective, a vehicle without an air-conditioning system would have fundamentally lower climate impacts, as no refrigerant would be consumed and emitted and no energy would be required to operate the A/C system. [EPA-HQ-OAR-2010-0799-9512-A1, p. 42]

A potential concern is aftermarket installation of air conditioning systems, especially kits provided by OEMs and installed by dealers at the time of purchase. The ICCT recommends that vehicles without air conditioning systems be given an appropriate amount of credits, provided that the manufacturer commits to monitoring and reporting on dealer-installed AC systems. [EPA-HQ-OAR-2010-0799-9512-A1, p. 42]

---

69 ICCT recognizes that HFC-132 phase-out would diminish the potential for 1234f replacement with HFC132a.

71 EPA guidance letter CISO-08-11;Use of OW Multi-grade Engine Oils in Gasoline Fueled EPA Test Vehicles, Sept. 18, 2008. EPA guidance letter CCO-04-7; Use of GF-4 Engine Oil in EPA Test Vehicles, March 2, 2004

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

The inclusion of credits for air conditioning system improvements provides an opportunity for the program to effectively address emissions of hydrofluorocarbons that have a very high global warming potential. [EPA-HQ-OAR-2010-0799-9476-A1, p. 3]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 72.]

In addition, the inclusion of credits for air-conditioning system improvements provides an opportunity for the program to address emissions of a class of high global warming potential refrigerants, the hydrofluorocarbons.

Organization: Toyota Motor North America

Air Conditioning (A/C) Leakage Credits [EPA-HQ-OAR-2010-0799-9586-A1, p.14]

High Leak Disincentive: Toyota does not agree with EPA's proposal to impose a high leak disincentive for refrigerants with a GWP below 150. EPA's proposal will compromise a manufacturer's ability to maximize credits~ when the manufacturer elects to utilize a global A/C system design. To obtain maximum credit, the system would unnecessarily need to be modified for the US market, incurring additional expense and resource requirements for no additional environmental benefit. Toyota thinks that EPA~s tampering concern, where R134a would be refilled in place of R1234yf, is unfounded because the service port fittings for the two refrigerants are incompatible which makes tampering highly improbable. Additionally, Toyota believes that appropriate measures are already in place that should be used to address any attempted tampering that were to occur in the field. [EPA-HQ-OAR-2010-0799-9586-A1, p.14]

Organization: Volkswagen Group of America

Volkswagen contributed to and supports the comments submitted by the Alliance of Automobile Manufacturers (Alliance) regarding Mobile Air Conditioning (MAC) system credits. [EPA-HQ-OAR-2010-0799-9569-A1, p. 30]

Volkswagen continues to make significant investments in deploying advanced MAC systems incorporating low-leak components and advanced low-GWP refrigerants. The successful market introduction of these advanced MAC systems relies to a great degree on the treatment of these systems within the GHG and CAFE program. [EPA-HQ-OAR-2010-0799-9569-A1, p. 30]

HIGH-LEAK DISINCENTIVE

Volkswagen is concerned by the EPA proposal to add a so called 'High Leak Disincentive'. There are two main reasons: Firstly our company as a major EU manufacturer is obliged by European law to change to refrigerants <150 GWP. Thus if we make significant investment and adapt our systems early to integrate low-GWP refrigerants, we would be penalized as fast mover. Secondly, Volkswagen maintains that refilling an updated system with older refrigerant is unlikely or even impossible due to differences in the filling systems. Therefore, Volkswagen recommends EPA to remove the 'High Leak Disincentive' factor. [EPA-HQ-OAR-2010-0799-9569-A1, p. 30]

LEVEL MONITORING

Volkswagen believes that additional refrigerant level monitoring obligations are not appropriate for mobile air conditioning systems. As discussed within the Alliance comments, in the case of MAC failure modes, the system simply stops operating thereby eliminating indirect CO_2 emissions. Figure App-0-1 shows that in case of refrigerant losses the power consumption of the A/C system would decrease as well. [See Figure App-0-1 on p. 32 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 31]

Organization: Volvo Car Corporation (VCC)

VCC continuously develops the climate system in order to reduce AC natural losses and improve durability. The strategy is to keep the rate of natural losses low and also to design the AC-system to prevent uncontrolled refrigerant losses during the full vehicle service life. [EPA-HQ-OAR-2010-0799-9551-A2, p. 9]

According to VCC the revised SAE J2727, which is a major improvement compared to the version of 2008, does get closer to a real world refrigerant loss rate than the previous version. At the assembly of the systems, VCC is testing all components and connections of the AC system with Helium to find any leakage before filling of refrigerants. However, VCC believes that the actual measured natural losses (according to SAE J2763) could be lower than the calculated natural losses, according to SAE J2727: [EPA-HQ-OAR-2010-0799-9551-A2, p. 9]

• SAE J2727 does not reflect all existing designs and technologies. VCC assumes that the reason for this is that such an expansion of the standards would make it very complex to use from a practical point of view. [EPA-HQ-OAR-2010-0799-9551-A2, p. 9]

• VCC uses a 'soft nose' concept of AC-connectors. The VCC technical solution has a low loss rate due to: [EPA-HQ-OAR-2010-0799-9551-A2, p. 9]

o Special rubber material used for the o-rings, a special variant of HNBR, specifically formulated for this application, where low permeation is one of the more prominent characteristics.

o The geometry of the outer, axially sealing o-ring where the two halves of the blocks are clamped together with zero clearance between these two surfaces, minimize the possible losses. [EPA-HQ-OAR-2010-0799-9551-A2, p. 10]

• The service valves cap in the VCC AC technology solution are equipped with a special seal that functions independent of the torque applied. The sealing properties are not a function of torque as it is with the standard cap more commonly used. SAE J2727 only includes the standard cap. The Standard industry cap seals properly if tightened by 0, 8 - 1, 2 Nm - too loose causes leak, and too tight causes seal damage. The service valve cap used by VCC has strong sealing capability at 20x of that torque. [EPA-HQ-OAR-2010-0799-9551-A2, p. 10]

• The part of the total natural losses coming from the compressor is too large according to independent measurements made by Ecoles des Mines in Paris (ordered by ACEA in Brussels). According to SAE J2727 natural losses of the compressor is 67%. Independent measurements indicate that the natural losses from the compressors, depending on brand and actual design} are in the range of 40-60%. VCC, therefore, believes that the calculated natural losses from the compressor are too large. [EPA-HQ-OAR-2010-0799-9551-A2, p. 10]

VCC performs physical tests in a mini-SHED according to the test method prescribed as F-gas directive 706/2007/EC. VCC strongly believes that physical measurements reflect real vehicle emissions more accurately than calculations and estimations. The proposed natural losses measurement standard SAE J2763 (Test procedure for determining R134a natural losses rates of Mobile Air Conditioning systems in a mini-SHED) is equal to the 706/2007/EC directive. VCC considers that natural losses rates < 10 gram/year are possible to measure in a mini-SHED. [EPA-HQ-OAR-2010-0799-9551-A2, p. 10]

CARB and the state of Minnesota allow physical measurements as an alternative to SAE J2727 calculations. [EPA-HQ-OAR-2010-0799-9551-A2, p. 10]

VCC would also like to point out that CARB has identified the possibility of physical measurements as a possibility. VCC supports CARB's intent to allow, as expressed in the draft's Appendix D, paragraph 2.5.6.3,l physical measurements of refrigerant leakage as an alternative to the latest version of SAE J2727. High Leak Disincentive [EPA-HQ-OAR-2010-0799-9551-A2, p. 10]

VCC does not support the EPA's proposal to reduce the AC direct credits via the 'high leak disincentive, if the refrigerant leakage rate is not reduced by half from industry average leak rates. This is a major change compared to the 2012-2016 program and reduces the value because it alters the rules of the game by adding low GWP for manufacturers considering early adoption. [EPA-HQ-OAR-2010-0799-9551-A2, p. 10]

Response:

Most commenters from the auto industry generally supported the proposed process for generating direct A/C credits by using SAE J2727 refrigerant leakage values. Most industry commenters, as well as Honeywell, opposed the "High Leak Disincentive" relating to A/C leakage credits; ICCT commented in favor of this provision. EPA's responses to these comments are presented in Section III.C.1.a.i of the preamble. EPA is retaining the provision, with some revisions. In regard to Honeywell's comment that the disincentive is not applied to HFC-134a and HFO-1234yf refrigerants in an equitable manner, as we discuss in TSD 5.1.2.3.2.5, the disincentive for low-GWP refrigerants only is intended to reduce the probability that the A/C system will be recharged with a high-GWP refrigerant.

EPA responds to comments related to EPA use of the updated SAE J2727 procedure in quantifying A/C leakage credits in the Joint TSD, Section 5.1.2.3. EPA is maintaining the use of this procedure as the basis for it leakage credits.

EPA responds to comments related to the expected transition to one or more alternative A/C refrigerants, including the potential pace of that transition and refrigerant availability, costs, vehicle technical issues, and manufacturing issues, in Section III.C.1.a.ii of the preamble. EPA continues to believe that the major transition to alternative refrigerants will primarily occur beginning around MY2017 and continue at a pace that we approximate by a 20% per year conversion through MY2021, based on the typical 5-year vehicle redesign cycle.

EPA responds to comments on the concept of monitoring refrigerant levels in Section 5.1.l.2.7 of the Joint TSD.

Regarding the comments from the California Air Resources Board, we have corrected the error in the High Leak Disincentive formula that CARB identified. In response to CARB comment 2), we have adjusted the threshold for incurring a High Leak Disincentive to lower values. (Specifically, we will reduce the threshold from 16.6 g/yr to 11.0 g/yr for systems with refrigerant charges equal to or less than 733g, and reduce the threshold by 1.5%/yr for systems with charges greater than 733g). In response to CARB comment 3), electric compressor systems should have a very low leak score, so we believe that incurring a High Leak Disincentive should not be an issue for systems incorporating this technology, and we have not further adjusted the proposed values.

Regarding concerns about the SAE J2727 procedure failing "to account adequately for the increased leakage as vehicles age," J2727 was correlated to JAMA and ACEA vehicle field test results (vehicle/shed test results are ~5 g/yr lower than what J2727 predicts. but the trends are identical). In addition, the SAE-IMAC study that formed the basis of J2727, "seasoned" the systems (10-day static soak at 36 deg C, and 30 minutes of system operation at 23 deg C ambient temp), so the components were broken-in, but not new. We continue to believe that deterioration of leakage emissions is adequately accounted for in J2727, and that basing leakage credits on those values is appropriate. We are also continuing to use a Global Warming Potential of 150 to determine whether an alternative refrigerant requires a manufacturer to consider the High Leak Disincentive term in the equation, consistent with other programs (CARB and Europe) that distinguish higher and lower GWP refrigerants.

Regarding the comment from ICCT about how to treat vehicles without A/C systems installed at the factory, we believe that if someone orders a vehicle without A/C, they aren't doing it to reduce GHGs - they're doing it because it's a feature they don't need (and consequently, don't want to pay for). Further, the use of aftermarket A/C systems in modern vehicles, which have tightly-packaged underhood and underdash environments, is highly unlikely. Therefore, as proposed, the program will not provide credits for vehicles without factory-installed A/C systems. In addition, in response to ICCT's comment regarding a requirement that the HFC-1234yf A/C systems "fail to operate" when recharged with another refrigerant, we know of no cost-effective, feasible technology that would allow us to incorporate such a requirement, and we are not pursuing this concept in this rule. Regarding the comment from Volvo about the option to use a "mini-SHED" procedure to establish leakage credits, the new February 2012 version of J2727 allows the use of a mini-SHED approach. We are incorporating the new J2727 by reference.

We acknowledge Honeywell's request for new regulatory measures to protect against parties reverting to higher GWP refrigerants over the life of a vehicle. It is true that EPA has found HFO-1234yf acceptable for use in new systems and not for retrofit in motor vehicle air conditioning systems under the Significant New Alternatives Policy (SNAP) program. It is also true that EPA has found HFC-134a acceptable for use both in new systems and for retrofit in motor vehicle air conditioning systems. However, we disagree that this means that users may retrofit a system designed for HFO-1234yf with HFC-134a. First, the SNAP listings, both for HFO-1234yf and for HFC-134a, are for use as a substitute for CFC-12. The SNAP listings do not say that different substitutes are interchangeable, as the commenter implies. Second, the regulations for the SNAP program at appendix D to subpart G of 40 CFR part 82 state, "No substitute refrigerant may be used to 'top-off' a system that uses another refrigerant. The original refrigerant must be recovered in accordance with regulations issued under section 609 of the CAA prior to charging with a substitute." Thus, it is not permissible to add HFC-134a to an MVAC system that contains HFO-1234yf, as may well occur if a consumer were to service his or her own car's AC system without refrigerant recovery equipment. Third, the regulations at appendix D to subpart G of 40 CFR part 82 and the listings for HFO-1234yf and HFC-134a require use of a unique set of fittings for a specific alternative refrigerant. The SNAP regulations in appendix D also state, "Using an adapter or deliberately modifying a fitting to use a different refrigerant is a violation of this use condition." The SNAP requirements for unique fittings do not prohibit retrofitting of vehicles using CFC-12, and appendix D to subpart G of 40 CFR part 82 sets out the conditions for such retrofits.

3.2. Credits Related to Improved A/C system Efficiency

Organizations Included in this Section

Alliance of Automobile Manufacturers
Delphi Corporation
Ford Motor Company
General Motors Company
Honeywell International, Inc.
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Johnson Controls, Inc.
Kia Motors
Motor & Equipment Manufacturers Association (MEMA)
Toyota Motor North America

Organization: Alliance of Automobile Manufacturers

The performance-based Mobile Air Conditioning (MAC) efficiency test needs additional technical analysis and testing, and the Alliance stands ready to work with the agencies to address these concerns. The proposed MAC efficiency test is likely to interfere with the achievement of maximum credit levels for improved system efficiency that were fully included in the agencies' feasibility analysis. The Alliance comments describe these concerns in depth and suggest that the test not be established as a strict requirement. Instead, we propose that the agencies continue to allow use of the credit menu, and that manufacturers work with EPA and NHTSA to provide "reasonable verification" of this progress through selected vehicle testing and other methods. Such verification will show that the menu amounts are appropriate, and that commensurate real-world progress is achieved. [EPA-HQ-OAR-2010-0799-9487-A1, p.5]

Organization: Delphi Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 110.]

Fourth, the air conditioning system is the highest ancillary load on the system. We highly support the EPA's proposed credit system to incentivize energy-efficient HVAC technology that can reduce the fuel needed for the air conditioning system by 40 percent.

Organization: Ford Motor Company

Ford supports the continuation of the A/C efficiency credit program into the 2017-2025 MY rule. [EPA-HQ-OAR-2010-0799-9463-A1, p. 10]

In addition, Ford supports the differentiation in credit levels for cars and trucks that are being proposed for 2017-2025 MY, based on the simulation work conducted by the EPA (TSD 5-32). [EPA-HQ-OAR-2010-0799-9463-A1, p. 14]

We support the proposed addition of the A/C efficiency benefits into the CAFE program which brings the NHTSA program one important step closer to harmonization with the EPA GHG program. [EPA-HQ-OAR-2010-0799-9463-A1, p. 14]

Organization: General Motors Company

GM supports the Mobile Air Conditioning (MAC) provisions included in the proposal. However, we, like the Alliance, have concerns regarding the performance-based MAC efficiency test and request that cooperative technical work continue - potentially as part of one of the mid-term review “check-ins” - to address the concerns with testing burden and reasonable verification of efficiency improvements. [EPA-HQ-OAR-2010-0799-9465-A1, p. 3]

Organization: Honeywell International, Inc.

Honeywell commends EPA and NHTSA for recognizing the measurable contribution that energy-efficient A/C systems and components can have in reducing CO_2 emissions and fuel consumption attributable to A/C operation. We support the agencies' proposal to allow auto manufacturers to generate fuel consumption improvement values for purposes of CAFE compliance by using technologies that enable A/C systems to run more efficiently. Honeywell offers that incorporating the most up-to-date research and technical information will add further credibility to the A/C Efficiency Credit by accounting accurately for the reduced emissions and energy efficiency attributable A/C system components. [EPA-HQ-OAR-2010-0799-9497-A1, p.9]

EPA and NHTSA Should Provide Flexibility in the A/C Efficiency Credit Program to Include New Performance-Based Test Methods That May Become Available Prior to 2026

EPA and NHTSA propose to allow auto manufacturers to generate credits for employing more energy efficient A/C component technologies ('A/C Efficiency Credits'). Honeywell encourages EPA and NHTSA to provide flexibility in the A/C Efficiency Credit program to accommodate new performance-based tests that may be developed during the life of program. EPA and NHTSA state in the Preamble that although they would ideally award A/C Efficiency Credits using a performance test, there currently is no reliable performance-based procedure capable of accurately quantifying efficiency credits. [EPA-HQ-OAR-2010-0799-9497-A1, p.9]

Organization: Hyundai America Technical Center

A/C Credits: [EPA-HQ-OAR-2010-0799-9547-A1, p.6]

1) Hyundai supports the use of the A/C menu for determining air conditioning system credits and supports an increase in the maximum amount of credits that will be permitted if we are able

to demonstrate an emission reduction greater than what is available in the menu. [EPA-HQ-OAR-2010-0799-9547-A1, p.6]

Organization: International Council on Clean Transportation (ICCT)

16. The ICCT strongly supports off-cycle credits in principle, as they can reduce compliance costs and increase benefits. However, the credits must avoid double counting and must be valid and verifiable. ICCT has provided detailed suggestions on how to improve the off-cycle credits so they are verifiable and do not inadvertently weaken overall standard stringency. [EPA-HQ-OAR-2010-0799-9512-A1, p. 4]

A/C off-cycle efficiency credits

ICCT appreciates US EPA and NHTSA's efforts to thoroughly document the potential benefits of A/C off-cycle credits based on both testing and engineering studies for each of the potential A/C technologies. While we have not fully reviewed the test data and studies for each type of credit, overall the agencies' basis for inclusion of credits for A/C system efficiency, leak reduction and alternative refrigerants is well documented. [EPA-HQ-OAR-2010-0799-9512-A1, p. 37]

Our primary concern with the air conditioning credits calculation is that methodology changes are needed to avoid double-counting the benefits from A/C load reductions and A/C system efficiency improvements. Currently, the efficiency credits and the load reduction credits are calculated independently. This is not appropriate. The efficiency reductions and the load reductions must be treated as a system to avoid double-counting.

To avoid double-counting, the ICCT recommends a multiplicative approach to A/C credit generation. Following is how the credit calculations should be done in concept:

A/C efficiency credits (CO_2 g/mi) = baseline A/C indirect emissions (CO_2 g/mi) improved A/C indirect emissions (CO_2 g/mi), where A/C indirect emissions are calculated as: A/C indirect emissions (CO_2 g/mi) = cooling load (degrees) x efficiency (kwhr/degree cooling) x engine CO_2/kWh [EPA-HQ-OAR-2010-0799-9512-A1, p. 38]

The baseline calculation is done using the baseline cooling load and A/C efficiency and the improved calculation is done using the improved values for cooling load and A/C efficiency. Note that the improved cooling load should include the impacts of solar reflective paint, window glazing, and active and passive ventilation, if these technologies are being counted towards off-cycle credits. [EPA-HQ-OAR-2010-0799-9512-A1, p. 38]

This approach should apply across the A/C system efficiency credits and the load reduction credits contained on the menu of non-A/C default credits. For instance, if an OEM claimed a 30% improvement in A/C system energy efficiency and a 40% reduction in solar load, the new energy consumption rate would be 42% of baseline (70% times 60%) for a total benefit of 58% times the engine CO_2/kw-hr, rather than a benefit of 70% times the engine CO_2/kw-hr. This multiplicative assessment should also hold true for determining the cumulative effects of individual A/C system efficiency improvement technologies. In addition, future engine efficiency should be verified as proposed including advanced engine technologies such as hybrids that may operate the A/C system with the internal combustion engine entirely turned off during idle. [EPA-HQ-OAR-2010-0799-9512-A1, p. 38]

US EPA and NHTSA should also account for the system efficiency impact of alternative refrigerants. In particular, any system efficiency disbenefit with a new refrigerant should offset either any alternative refrigerant credit or A/C system efficiency credit in this case. [EPA-HQ-OAR-2010-0799-9512-A1, p. 38]

Organization: Johnson Controls, Inc.

Specifically, we support the inclusion of fuel consumption reductions resulting from air conditioning improvements [NHTSA-2010-0131-0253-A1, p. 2]

Organization: Kia Motors

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 102.]

Additionally, Kia requests the industry -- for industry consistency that EPA set more detailed guidelines for the framework to prove out the A/C system durability. It's unclear how A/C system durability is defined.

Organization: Motor & Equipment Manufacturers Association (MEMA)

1. Oil Separators [EPA-HQ-OAR-2010-0799-9478-A1, p.5]

In the NPRM, there is a credit of 0.5 to 0.7 g CO_2/mi proposed for an oil separator in the A/C system. This credit is for either an internal or external oil separator and “the baseline component for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model.” MEMA asks the agencies to clarify by changing this to read: “the baseline component for comparison is the version which a manufacturer most recently had in production without an oil separation feature on the same vehicle design or in a similar or related vehicle model.” [EPA-HQ-OAR-2010-0799-9478-A1, pp.5-6]

2. Improved Condensers / Evaporators [EPA-HQ-OAR-2010-0799-9478-A1, p.6]

In the NPRM, the credit listed for improved condensers and/or evaporators ranges from 1.0 to 1.4 gCO_2/mi. The conditional requirement for this credit is “system analysis on the component(s) indicating a coefficient of performance improvement for the system of greater than 10 percent when compared to previous industry standard designs.” Based on this prerequisite, MEMA believes that early adopters of high performance heat exchangers will not receive the incentive for their proactive behavior. Therefore, MEMA recommends that standards for heat transfer and pressure drop – at fixed air inlet conditions (temperature, humidity, flow rate) and refrigerant inlet conditions (temperature, pressure, flow rate) – be the prerequisite for the credit. This will help prevent content regression and provide equitable treatment to both early and later adopters. [EPA-HQ-OAR-2010-0799-9478-A1, p.6]

3. Internal Heat Exchanger [EPA-HQ-OAR-2010-0799-9478-A1, p.6]

There are no conditional requirements listed in the NPRM for the Internal Heat Exchanger credit. Similar to the improved condensers and evaporators, MEMA recommends that the agencies include a performance threshold for the credit. We note that both the heat transfer and the vapor side pressure drop are critical attributes of the internal heat exchanger to improve the energy efficiency of the A/C system. A standard for heat transfer performance and vapor side pressure drop at fixed inlet refrigerant conditions (temperature, pressure, flow rate) should be set to ensure actual improvement in system coefficient of performance. The graph below highlights the importance of vapor side pressure drop. [EPA-HQ-OAR-2010-0799-9478-A1, p.6] [For the associated graph please refer to EPA-HQ-OAR-2010-0799-9478-A1, p.6]

Organization: Toyota Motor North America

EPA is proposing to allow manufacturers to generate credits for improvements to air conditioning systems that reduce GHG emissions. In the CAFE portion of the joint proposal, NHTSA is proposing to allow fuel consumption reductions equivalent to the GHG credits allowed by EPA that would be applicable for the credit menus provided for MAC efficiency and the use of off-cycle technologies. Toyota believes that the proposals are appropriate and fully supports the Alliance comments that address the details of the provisions. However, Toyota offers additional comments and concerns on several issues below. [EPA-HQ-OAR-2010-0799-9586-A1, p.13]

Response:

EPA acknowledges the general support for credits related to improved A/C system efficiency and the use of a new test cycle to provide “reasonable verification” (Alliance of Automobile Manufacturers) that the efficiency-improving technologies and methods employed produce quantifiable reductions in GHG emissions. EPA responses to comments related to the A/C efficiency credit program are found in Section II.F.1 and Section III.C.1 of the preamble to the rule, as well as in Section 5.1 of the joint TSD.

Regarding the comment from ICCT that a “multiplicative approach” should be used to avoid double-counting the credits (i.e. where A/C load reductions show up as ‘credits’ as well as on the 5-cycle emissions result), we disagree that our approach will lead to double-counting. Since tailpipe CO_2 emissions standards are based on a 2-cycle test (FTP and HWY cycles) where the A/C system is turned off, the reduction in engine load due to A/C efficiency improvements (whether direct A/C compressor load reduction, or system load reduction due to improved solar and cabin ventilation technologies) is not measured, and therefore cannot be double-counted. We believe that technologies that reduce the cooling load on the vehicle’s A/C system (e.g. glazing, cabin ventilation, solar reflective paint, etc.) are best addressed using the off-cycle credit provisions of this rule (see preamble Section III.C.5 and TSD Section 5.2).

Regarding the comment from MEMA that we incorporate specific language to define the components and common test conditions to quantify their benefits, in order to generate credits for oil separators, improved condensers/evaporators, and internal heat exchangers, we cannot incorporate proscriptive language regarding these technologies, as the implementation of these technologies is manufacturer-specific. In addition, we do not believe that setting a common set of test conditions for demonstrating their performance characteristics or introducing common descriptive language regarding their design are is feasible at this time. Should industry organizations adopt common methods and procedures regarding the performance of A/C technologies, we could consider them in future rules. But until such methods are available, we will require manufacturers to demonstrate the effectiveness of these components on a case-by-case basis during the certification process, as proposed.

3.2.1. A/C Test Procedures

Alliance of Automobile Manufacturers
American Honda Motor Co., Inc.
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
Chrysler Group LLC
Enhanced Protective Glass Automotive Association (EPGAA)
Ferrari
Ford Motor Company
Guardian Automotive Products, Inc.
Honeywell International, Inc.
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Kia Motors
Mercedes-Benz USA, LLC
Mitsubishi Motors R&D of America, Inc. (MRDA)
Pittsburgh Glass Works (PGW)
Toyota Motor North America
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

Idle Test [EPA-HQ-OAR-2010-0799-9487-A1, p.46]

The MY 2012-2016 EPA GHG program uses a menu of credits for application of various MAC efficiency technologies. However, beginning in MY 2014, an “idle test” requirement is superimposed on the credit menu, such that certain emissions thresholds must be achieved on the idle test before credits can be granted for application of the technologies on the menu. The Alliance, as well as individual manufacturers, supported the credit menu, but commented during that rulemaking process on the inadvisability of superimposing the idle test. [EPA-HQ-OAR-2010-0799-9487-A1, p.46]

One key concern was that the most promising real-world MAC efficiency technologies - those that reduce compressor workloads at moderate ambient temperatures - would not have sufficient time to show their benefits during the idle test procedure. Although the idle test is not performed at a high ambient temperature, the idle test procedure calls for the systems to be operated as if they were responding to high ambient temperatures. Automatic systems are set to 9oF below the 75oF ambient temperature. Thus, in order to get to the unrealistically low 66oF interior setting required by the test procedure, the automatic systems work at maximum cooldown through much of the 10-minute MAC-on portion of the test. Manual MAC systems are tested at maximum cooldown for ten minutes (as if responding to a high ambient temperature) and at a low fan setting for ten minutes. [EPA-HQ-OAR-2010-0799-9487-A1, p.46]

The SAE IMAC study, which was a major basis for EPA's idle test thresholds, demonstrated a 30% lifecycle energy efficiency improvement for a nationally representative mix of high, moderate and light MAC loads. But the energy efficiency improvements came primarily from better moderate temperature technologies. At moderate and light loads, efficiency improvements of 40% or more were recorded. An energy efficiency improvement of only 5% to 10% was measured at high ambient temperatures. [EPA-HQ-OAR-2010-0799-9487-A1, pp.46-47]

Since the development of the MY 2012-2016 regulation, many idle tests have been run in automobile manufacturer laboratories, and the anticipated concerns, as well as other problems, have been confirmed. [EPA-HQ-OAR-2010-0799-9487-A1, p.47]

One of the most prominent issues identified for the idle test is that smaller displacement engines will receive significantly less EPA CO_2 credit for the same HVAC technology content, compared to larger displacement engines. [EPA-HQ-OAR-2010-0799-9487-A1, p.47]

Manufacturer testing also shows that on small engines, even the most sophisticated MAC systems will probably receive little EPA CO_2 credit because of their idle test results, thereby sharply reducing the incentive to apply MAC efficiency technologies to these vehicles. [EPA-HQ-OAR-2010-0799-9487-A1, p.47]

Test-to-test variability is large relative to the scale for getting credit, creating an additional element of regulatory compliance planning uncertainty, resulting in an additional barrier to MAC efficiency technology implementation. High variation is inherent in this test, in part due to the higher CVS dilution (low CO_2 concentrations) of tailpipe exhaust gases for a vehicle at idle, which makes CO_2 measurement highly variable being close to the limit of detection of the analyzer. [EPA-HQ-OAR-2010-0799-9487-A1, p.47]

Many of these preliminary idle test results and their implications have been communicated to EPA over the past two years, and these issues are discussed by EPA in the NPRM. Although the idle test has some relationship to MAC efficiency, it does not sufficiently get at the most important area for improvement, the moderate load technologies, since much of the idle test is conducted as if the vehicle were in a high ambient temperature, with corresponding high demands placed on the MAC system. The thresholds for obtaining full credit were established by EPA based on the premise of a 30% efficiency improvement over baseline MAC technologies. This is a challenging hurdle that can only be met if moderate and light load technologies are allowed to demonstrate their benefits to a substantially greater extent than the idle test allows. Based on the tests reported to EPA, no vehicle with an engine below approximately 2.5 liters in displacement would receive full credit for its MAC technologies, due to the idle test results (e.g., TSD p. 5-40). Unmodified, the idle test poses a potentially insurmountable obstacle to MAC improvements for credits on many vehicles, especially those with small engines which are anticipated to be predominant in the future. [EPA-HQ-OAR-2010-0799-9487-A1, p.47]

The test-to-test variability is an additional obstacle, since it introduces inherent uncertainty as to whether technology additions will ultimately result in credits. MAC operation is a fraction of overall vehicle fuel consumption, and the fuel consumption difference between a good, advanced technology MAC system and a bad MAC system is a matter of only a few grams of CO_2 per mile (or per minute). On the idle test scale, the total range from maximum credit to no credit is only 6.4 g CO_2/minute. Thus, significant test-to-test variation (even as low as a gram or two) carries the potential to negate a large portion of the planned credits for any program to improve MAC efficiency technology or to move the vehicle to the next level of credits. In testing reported at the United States Council for Automotive Research (US CAR), standard deviations of over 1.0 gCO_2/minute were consistently found from repeated idle testing on the same vehicle. Statistically, this shows that inherent test-to-test variation could negate a substantial portion of the MAC indirect credits for any vehicle. [EPA-HQ-OAR-2010-0799-9487-A1, pp.47-48]

Idle Test Temperature and Humidity Tolerances [EPA-HQ-OAR-2010-0799-9487-A1, p.48]

The Alliance supports EPA's effort to broaden the ambient air temperature and humidity specifications for the idle test and the optional idle test, from the current requirements for humidity levels of 50 ± 5 grains/pound, average temperature 75 ± 2 °F and instantaneous temperature: 75 ± 5 °F. We also support the EPA proposal to relax temperature and humidity requirements in order to use test cells designed for FTP testing. The data that manufacturers shared with EPA on June 30, 2011 (EPA Ann Arbor Meeting) showed that some tests run at a manufacturer's lab failed/exceeded these stringent specifications defined for the idle test on temperature and humidity. Automaker emission test facilities are not all designed for tight temperature and humidity controls such as are required for SC03 test chambers. Since the idle/optional idle test will not require solar loads, these tests will probably not be performed in SC03 solar test cells. The non-solar test cells are designed to run standard emission tests such as the FTP (EPA75), Highway Fuel Economy (HWFET) and US06 tests, where temperature and humidity specifications are less stringent as compared to the current A/C SC03 test specifications. If the temperature and humidity range is not widened, it will cause a large percentage of void tests that the manufacturers will be forced to repeat simply because of seasonal temperature and humidity variation or because the original specifications of test cell HVAC system were not designed around the idle test limits. This will add to the manufacturer testing burden and costs without any significant benefit to the accuracy of the test results. Therefore, the Alliance encourages EPA to widen these temperature and humidity specifications limits on the idle/optional idle tests, as proposed, so that they can be performed in the non SC03 chambers without added testing and cost burdens on manufacturers. [EPA-HQ-OAR-2010-0799-9487-A1, p.48]

The Alliance recommends the following humidity and temperature tolerances: [EPA-HQ-OAR-2010-0799-9487-A1, p.48]

(1) Ambient humidity within the test cell during all phases of the test sequence shall be controlled to an average of 50 ± 10 grains of water/pound of dry air. [EPA-HQ-OAR-2010-0799-9487-A1, p.48]

(2) Ambient air temperature within the test cell during all phases of the test sequence shall be controlled to 75 ±5 °F on average and 75 ±10 °F as an instantaneous measurement. Air temperature shall be recorded continuously at a minimum of 30 second intervals. [EPA-HQ-OAR-2010-0799-9487-A1, p.48]

Idle Test Engine Size Adjustment [EPA-HQ-OAR-2010-0799-9487-A1, p.49]

To partially address these concerns, EPA proposes an optional revised set of thresholds for performance on the idle test beginning in 2014. The revised thresholds are adjusted for engine size, so that smaller engines receive better scores and more ability to earn credits from application of MAC technologies on the credit menu. Although we believe all the idle test requirements should be discarded from the MAC program, if the idle test is kept, then it is useful to add this optional engine-size adjusted set of thresholds. [EPA-HQ-OAR-2010-0799-9487-A1, p.49]

Adding the engine size adjustment option to the MAC program is an improvement, but it does not solve the most fundamental problems with the idle test. The most important technologies for real-world energy savings, the moderate load technologies, would continue to show little benefit on the idle test, and the test-to-test variability would remain inherently high. We therefore believe that both the idle test and the engine size-adjusted idle test contribute little toward the goal of ensuring real-world greenhouse gas reduction, and that they will do little to encourage improved MAC technology implementation. [EPA-HQ-OAR-2010-0799-9487-A1, p.49]

Reasonable Verification [EPA-HQ-OAR-2010-0799-9487-A1, p.49]

The Alliance supports the EPA goal stated in the NPRM of “reasonable verification” that the technologies receiving credit from the credit menu are actually producing commensurate levels of GHG reduction. Chrysler, Ford and GM have worked with EPA and CARB over the past several months at USCAR to evaluate procedures for MAC efficiency testing. This work has identified several key criteria and issues for MAC testing that directly relate to the goal of reasonable verification. This research has resulted in the draft “AC17” test procedure discussed in the NPRM. [EPA-HQ-OAR-2010-0799-9487-A1, p.49]

Since the creation of the EPA MAC program, automobile manufacturers have believed that the MAC technology improvements on the EPA credit menu will result in actual GHG emission reductions that significantly surpass the amounts of the credits on the menu. This stems from the methodology used to quantify credits on the menu. EPA began with an overall inventory of estimated fuel consumption from MAC operation, then apportioned improvements from that inventory to the percentage improvements identified for various prominent MAC efficiency technologies, especially those used by the SAE IMAC cooperative research program. EPA estimated that MAC operation accounted for 14.3 g CO_2/mile on average for each vehicle, representing 3.9% of national light duty vehicle GHG emissions. The cap of 5.7 g CO_2/mile was derived as 40% of the 14.3 g CO_2/mile total, and the credit for each technology was roughly calculated as a percent improvement of the 14.3 g CO_2/mile total. [EPA-HQ-OAR-2010-0799-9487-A1, pp.49-50]

Automobile manufacturers commented at that time that the EPA inventory of fuel consumed for MAC operation was at the low end of the range of estimates by various researchers, such as studies by the National Renewable Energy Laboratory (NREL) and
Northeast States Center for a Clean Air Future (NESCCAF)/CARB. For example, NREL estimates were that MAC usage consumed 5.5% of national light duty fuel usage. NESCCAF and CARB together estimated that MAC operation accounted for 5.3% of a vehicles fuel usage. These alternative estimates are at least 70% higher than the 14.3 g CO_2/mile figure ultimately used by EPA. In the MY 2012-2016 Regulatory Impact Analysis, there is a complicated comparison of these studies, and EPA made numerous adjustments and assumptions in arriving at its ultimate figures, noting numerous uncertainties along the way. Without fully replaying that debate, suffice it to say that automobile manufacturers believed MAC compressors were engaged much more often and used more total fuel than EPA estimated, and that the higher estimates from relatively sophisticated analyses by NREL and NESCCAF/CARB were closer to the real-world MAC energy consumption. [EPA-HQ-OAR-2010-0799-9487-A1, p.50]

If the higher amounts of baseline MAC fuel consumption were used, the reductions from each MAC efficiency technology would be expected to be much greater than the figures used in the EPA credit menu. EPA finalized the regulation using its own (low) estimate of total MAC fuel consumption, resulting in credits on the menu that should be very conservative compared to actual vehicle usage, as measured by other researchers and industry data, and as used in the SAE IMAC program. This should be kept in mind when considering the need for thorough and precise verification procedures, since EPA’s very conservative methodology in creating the credits results in a huge margin before real-world emissions reductions might fall short of the credited amounts. [EPA-HQ-OAR-2010-0799-9487-A1, p.50]

AC17 Test [EPA-HQ-OAR-2010-0799-9487-A1, p.50]

The auto industry has shared EPA and CARB’s interest in furthering understanding of these issues, and the draft AC17 vehicle test procedure that we jointly developed through USCAR is a significant step to aid future research. We therefore strongly support adding an option to use the AC17 procedure as a reporting-only alternative to the idle test to demonstrate that a vehicle’s MAC system is delivering the efficiency benefits of the new technologies from the credit menu in MY 2014-2016. [EPA-HQ-OAR-2010-0799-9487-A1, p.50]

During the development of the AC17 procedure, it was shown that a very complicated and elaborate procedure would unavoidably be needed to accurately measure MAC energy consumption. A high level of vehicle instrumentation is needed, in part to understand what is happening throughout the test and identify voided tests where the procedure may have gone wrong. A high number of voided tests are to be expected. Also, the procedure cannot be conducted in a standard FTP test cell, but needs a climate controlled chamber with solar lamps that meets SC03 test specifications. At least four hours is needed for the test, due to the desire to include solar soak periods that attempt to comprehend the benefits of reduced thermal load technologies. In addition, even with the improved repeatability and added instrumentation of the AC17 test, testing has shown that a single AC17 test may not demonstrate the benefit of a single or a bundled set of technologies. In order to statistically verify the benefit, multiple tests may need to be run and statistically analyzed. [EPA-HQ-OAR-2010-0799-9487-A1, pp.50-51]

In total, although this test is unlike any other used for emission certification (or any other regulatory certification program), the high level of complexity was arrived at and determined to be necessary in pursuit of the goals of an accurate, reproducible test that could distinguish a good MAC system from a bad one under representative ambient climate conditions, and which could validate the benefits of the technologies on the EPA credit menu. [EPA-HQ-OAR-2010-0799-9487-A1, p.51]

EPA proposes testing with the relevant technologies turned “on” then turned “off” in order to validate the improvements that are awarded from the credit menu. We agree with the principle of validating the menu credit amounts through actual vehicle testing, but note the difficulty of doing this on a comprehensive basis for every model of vehicle. In actuality, there is typically no baseline vehicle and baseline MAC system that is engineered and built without the improved MAC technologies for true apples-to-apples comparison of tests with the MAC technologies turned “on,” and then turned “off.” For example, if a variable compressor with the associated computer controls is engineered for a vehicle platform, it is typically applied across-the-board on that platform, and no systems are built with a fixed compressor or with the computer controls that would be necessary to get optimized performance from this fixed compressor. [EPA-HQ-OAR-2010-0799-9487-A1, p.51]

The exercise suggested by EPA is more appropriately viewed as a research exercise, rather than a traditional vehicle emissions certification program. For example, the IMAC program tested a baseline Cadillac vehicle, and then added various new MAC technologies, including new, smarter computer controls that improved vehicle integration. The improvements from each added new technology were measured as the IMAC program progressed. However, IMAC was a research program that cost hundreds of thousands of dollars, involved experts from approximately 40 corporations, government labs and agencies, and spanned approximately two years. To expect such a complicated procedure to validate the menu credit amounts for a large number of vehicles is simply not feasible and would violate the boundaries of “reasonable verification.” [EPA-HQ-OAR-2010-0799-9487-A1, p.51]

In some circumstances, it may be possible to obtain (or build) baseline vehicles which approximate the apples-to-apples technology “on” versus technology “off” comparisons that EPA seeks. A research program would seek to identify the best of these vehicle opportunities and, on a selected basis, use them to answer the research questions that are to be studied. Such a program would allow for multiple repetitions of the test to be run on the selected vehicles to statistically verify results. There are only approximately eight efficiency technologies on the MAC credit menu (including the two levels of reduced reheat). This is a manageable number of technologies to assess using the AC17 test (or other methods) in a detailed way in order to validate the amount of credits provided by the menu. On a survey basis, it can also be used to show that the credit amounts from the menu are being consistently achieved, but it is not reasonable to require that this be tested on every model or platform. [EPA-HQ-OAR-2010-0799-9487-A1, pp.51-52]

Due to the complexity of the required tests, the rarity of good baseline comparison opportunities, and the overall high test burden of this program in comparison to the amount of credits involved, the Alliance recommends that EPA to utilize the AC17 test solely to validate menu credit amounts and monitor progress on a sample basis, rather than as a mandatory certification test that must be run on every vehicle model or platform in order to achieve MAC efficiency credits. [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

AC17 Thresholds [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

EPA raises the possibility of setting an absolute required threshold for the AC17 test, as was done in 2014 with the idle test, rather than comparing improvements to case-by-case baselines. This raises a host of complex issues. Establishing these standards would be a very complex exercise, and two key issues emerge that show this to be a bad idea, even before entering into the particular issues related to the standard setting process. [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

First, the test burden would be overwhelming. The AC17 test is much longer and more complicated than other emissions tests, and it cannot be used in the same way. [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

Second, the planning uncertainties and implementation difficulties from such a complex program would become an insurmountable obstacle to getting better MAC technologies implemented. Rather than speeding progress in this area, the tests would slow or stop the progress that is being made. [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

AC17 Corrections and Clarifications [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

We note the need for the following minor technical corrections and clarifications in the AC17 procedure written in the NPRM: [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

During the soak that occurs between the preconditioning and test cycle (for both the solar-on and solar-off portions of the test) we believe that instead of turning the cooling fan off, it should be set to 4 mph. The low wind level is a more representative real-world condition. Maintaining that fan speed impacts solar glazing technology. This change would impact 40 C.F.R. §86.167(f)(8). [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

A solar load tolerance of 850 W/m2 +/- 45W/m2 should be allowed, and the procedure should specify 'solar off' for the MAC off test. [EPA-HQ-OAR-2010-0799-9487-A1, p.52]

If windows are partially cracked during the test in order to accommodate wiring or other test instrumentation, a piece of foam or other flexible insulation should be used to keep a tight seal when the window should be closed or when wires are inserted through the gap. (Without this, the gap is too large where the various cords run through the window and the vehicle will not heat up consistently during the solar soak.) [EPA-HQ-OAR-2010-0799-9487-A1, pp.52-53]

In the test procedure flow chart on p. 75359 of the NPRM the word “Nominal” should be added to “Time (Minutes)” [EPA-HQ-OAR-2010-0799-9487-A1, p.53]

AC17 Test Vehicle Selection [EPA-HQ-OAR-2010-0799-9487-A1, p.53]

Because the AC17 test is so long, expensive and complicated, the number of tests should be minimized to a manageable level, no matter what the ultimate purpose of the test. These tests must be done in climate-controlled SC03 chambers, not in regular FTP test cells, and test capacity is very limited in SC03 chambers. MAC systems generally have consistent designs and specifications on each vehicle platform (except that some platforms now have hybrid powertrain models, which would usually have a very efficient MAC electric compressor), so performing one test per vehicle platform would give a good overview of MAC efficiency performance. However, vehicle platforms usually have multiple engine and transmission combinations available, so the number of tests would escalate rapidly if various engine and transmission combinations require testing. [EPA-HQ-OAR-2010-0799-9487-A1, p.53]

For example, for 2012 model certification, one manufacturer, GM, tested and certified approximately 20 vehicle platforms. There were approximately 85 GM platform/engine combinations, and this number then approximately doubles if transmission combinations are included. Clearly, if various engine/transmission combinations required testing, the MAC testing program would surpass the number of tests performed for tailpipe certification, which violates the standard of “reasonable “verification,” considering the relatively small environmental impacts of MAC indirect GHG emissions. [EPA-HQ-OAR-2010-0799-9487-A1, p.53]

We therefore object to the criteria for test vehicle selection proposed in the NPRM, which defines a platform as “a group of vehicles with common body floorplan, chassis, engine and transmission.” We propose the following “platform” definition, which is adapted from the current EPA definition for a “carline”: [EPA-HQ-OAR-2010-0799-9487-A1, p.53]

Platform means a group of vehicles within an OEM which has a degree of commonality in construction (e.g., body, chassis). Platform does not consider the model name, brand or marketing division, does not consider any level of decor or opulence and also does not consider characteristics such as roof line, number of doors, seats, or windows. A platform may include vehicles from various fuel economy classes, including both cars and trucks. [EPA-HQ-OAR-2010-0799-9487-A1, p.53]

This definition provides the flexibility to combine the large variations which occur within platform families that use the same MAC architecture. Intra-platform variation is based on "floorplan" such as two-door, four-door and wagon/crossover variants or SUV/pickup variants, as well as powertrains. However, the benefit of the menu technologies should not be significantly affected by body style or powertrain. We recommend that wherever the term "platform" is used in MAC regulations, it be based on the flexible and inclusive definition proposed above by the Alliance. [EPA-HQ-OAR-2010-0799-9487-A1, pp.53-54]

In addition, in 40 C.F.R. 86.1866-12(c)(6)(iii), EPA proposes that the highest selling sub-configuration within each platform be tested in the first model year for which a MAC system is expected to generate credits and then one additional sub-configuration must be tested in each subsequent model year until all sub-configurations within the platform have been tested. Given the fact that a platform will contain tens, if not hundreds, of sub-configurations, this proposal essentially eliminates the possibility for a manufacturer to "carryover" representative data from a prior model year and unnecessarily increases a manufacturers overall testing burden. Therefore, we urge EPA to allow the use of good engineering judgment when selecting a representative test vehicle for each platform and when determining whether carryover of data is appropriate. Also, if EPA were to persist on having sales figures be a part of the basis for test vehicle selection, sales projections should be clearly allowed as the basis for these test vehicle selections rather than waiting for actual sales figures to be finalized at the end of the year. [EPA-HQ-OAR-2010-0799-9487-A1, p.54]

Finally, we believe that 40 C.F.R. §86.1866-12(c)(6)(iv) is redundant to 40 C.F.R. §86.1866-12(c)(6)(iii) and should be removed. [EPA-HQ-OAR-2010-0799-9487-A1, p.54]

AC17 Test Burden [EPA-HQ-OAR-2010-0799-9487-A1, p.54]

The AC17 test takes approximately four hours, which is eight times as long as the idle test. Further, AC17 requires more technician time to set up the elaborate instrumentation, and it requires SC03 climate-controlled test cells. More voided tests are also expected with AC17, due to all the complications. The following are specific recommendations to reduce test burden: [EPA-HQ-OAR-2010-0799-9487-A1, p.54]

86.167-17 (a) Overview. [EPA-HQ-OAR-2010-0799-9487-A1, p.54]

The reference for humidity should be changed from "…50 percent relative humidity…" to "…69 grains of water / pound of dry air…" to be consistent with our recommendation for test cell ambient conditions (please see our next recommendation). [EPA-HQ-OAR-2010-0799-9487-A1, p.54]

86.167-17 (c) Test cell ambient conditions. [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

The proposed A17 test procedure limits are extremely stringent. SC03 test facilities were not designed to operate at 77 °F at 69 grains of water/pound of dry air humidity at 850 W/m2 solar load. We recommend that the tolerances be widened to minimize test voids without significantly impacting testing accuracy as described below: [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

§ 86.167–17 (c) Test cell ambient conditions. [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

The test cell ambient temperature and humidity recorded values should lie within the specifications at least 95% of the time [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

(1) Ambient Air Temperature (i) Temperature = 77 ± 3 °F air temperature on average and 77 ± 5 °F air temperature instantaneous [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

(2) Ambient Humidity (i) Humidity = 69 ± 5 grains of water/pound of dry air on average and 69 ± 10 grains of water/pound of dry air instantaneous [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

§ 86.167–17(d) Interior temperature measurement. [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

A thermocouple location tolerance should be added to (d) Interior temperature measurement. The current requirement is too restrictive for high volume production testing (language implies a location of exactly 30mm and 330 mm). The word “nominally” should be added before each measurement tolerance and OEM’s should not be required to validate exact physical location by documenting dimensions. Also there may be some vehicles (like 2 seat sports cars or pickup trucks) where the distance below the roof or behind the headrest is not achievable due to physical constraints of vehicle (example; rear deck lids or window). In these cases language should be added to allow OEM’s to use “good engineering judgment” to get a close as possible to these prescribed physical locations. [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

§ 86.167–17(e) Air conditioning system settings. [EPA-HQ-OAR-2010-0799-9487-A1, p.55]

The requirement for “6 volts at the motor” is too unwieldy a specification to be reliably executed in high volume testing and may not even be achievable, given varying motor voltage configurations such as vehicles with systems other than 12-volt. We recommend that it be reduced to the setting closest to “6 volts at the motor” or the blower switch position at 50% of maximum blower speed, or immediately below 50% if there are an odd number of positions. For example, position 2 if the maximum is position 4, or position 3 if the maximum is position 7. Also, the word “nominal” should be added to the requirement “…to provide 55 degF…” since (1) this temperature may change with different segments of the test (idles, accelerations, cruses, decelerations) or (2) with some vehicles may not achievable or stable at this idle period, and (3) implies a tolerance of ±0.49 degF which may be difficult to set in such a short period of time. Finally, on vehicles that 'default to recirculated air above 75 °F,' the OEM should have the option to let this feature function as intended and not be required to start in recirculated air and change to outside air at the first idle of the SC03. [EPA-HQ-OAR-2010-0799-9487-A1, pp.55-56]

§ 86.167–17(f)(8) Procedures following the preconditioning cycle. [EPA-HQ-OAR-2010-0799-9487-A1, p.56]

Following the preconditioning cycle, the test vehicle and cooling fan(s) are turned off, all windows are rolled up, and the vehicle is allowed to soak in the ambient conditions of paragraph (c)(1) of this section for 30 ±1 minutes. The solar heat system must be turned on and generating 850 W/m2 within 1 minute of turning the engine off. [EPA-HQ-OAR-2010-0799-9487-A1, p.56]

This requirement implies that the solar heat system must be turned on and achieves 850 W/m2 within 1 minute of turning the engine off. This takes four events to accomplish: (1) turn engine off, (2) turn solar lamps (heat) load on, (3) set pyrometers up near the vehicle, (4) solar load lamps warm up to produce 850 W/m2. One minute (total) is insufficient time to accomplish these tasks as just item #4 can take more than five minutes to achieve (produce 850 W/m2). Since this short time requirement of one minute is really not a critical element to the test, we recommend changing it to: [EPA-HQ-OAR-2010-0799-9487-A1, p.56]

The solar heat system must be turned on within one minute of turning the engine off. The 30 minute soak starts immediately after the solar load has achieved 850 ± 45 W/m2. Facility calibration data on solar lamp warm-up can be used to establish the start of solar soak time. Total soak time would be time to turn on the lights (e.g., one minute) plus lamp warm-up time (from calibration data) plus 30 minute solar soak. For example if the facility calibration demonstrates the lamps reach 850 W/m2 within two minutes, the soak time can be standardized at 33 minutes after engine off for that facility. [EPA-HQ-OAR-2010-0799-9487-A1, p.56]

§ 86.167–17(f)(10) “Air conditioning off” test. [EPA-HQ-OAR-2010-0799-9487-A1, p.56]

The air conditioning off test is identical to the steps identified in paragraphs (d)(1) through (9) of this section, except that the air conditioning system and fan speeds are set to complete off or the lowest. It is preferred that the air conditioning off test be conducted sequentially after the air conditioning on test, following a 10–15 minute soak.” We believe this to be a typo, “…set to complete off or the lowest (setting).” Also during this SC03 and HFET portion of the air conditioning off test, (f)(8) requires “…all windows are rolled up…”. Provisions need to be made to allow the driver to get sufficient cooling, such as allowing the windows to be partially or fully opened during the “air conditioning off” portion of the test. [EPA-HQ-OAR-2010-0799-9487-A1, p.56]

The MY 2014-2016 regulation currently allows substantial flexibility based on good engineering judgment to limit idle testing to one worst-case vehicle per platform, and carryover data could be used from one year to the next if no changes are made to a platform. Under the current regulation, although initially all platforms would need testing, over time, the regular cadence of vehicle changes over (typical) five-year program lives would mean that only 20% or so of each manufacturer’s platforms would need testing in any year. [EPA-HQ-OAR-2010-0799-9487-A1, pp.56-57]

In contrast, the new proposal requires AC17 testing in each year on each platform that receives credit. Beginning in 2017, carryover data is effectively disallowed, since a different sub-configuration within the platform must be tested each year. Also, the technology “on” and technology “off” testing effectively doubles the number of tests. Thus, the high test burden from attempting to test every platform every year with the AC17 test exceeds the objective of reasonable verification, since the test burden has grown exponentially from the original idle test. Disallowing carryover data effectively raises the number of tests approximately five-fold, the technology “on” versus “off” requirement then doubles the number of tests, and the AC17 test is at least eight times longer than the idle test. Although this is very rough math, it shows that the proposed approach would require approximately 80 times more test hours. [EPA-HQ-OAR-2010-0799-9487-A1, p.57]

The objectives of menu validation and monitoring real-world progress can be achieved with a much lower test burden than this. In view of the complexity of the AC17 test in comparison with the idle test as well as other emission certification tests, no manufacturer should be required to conduct AC17 testing on more than four platforms in any year. [EPA-HQ-OAR-2010-0799-9487-A1, p.57]

Bench Testing [EPA-HQ-OAR-2010-0799-9487-A1, p.57]

SAE procedures have been developed for bench testing of MAC systems at a range of steady-state speeds and for the calculation of the Lifecycle Climate Change Performance of the system using the steady-state results as input data. These methodologies were used for some analyses within the IMAC program. [EPA-HQ-OAR-2010-0799-9487-A1, p.57]

These procedures have strengths as well as weaknesses. The bench test data is accurate and reproducible, although the full battery of SAE tests is very expensive to run (e.g., $80,000 per model), and automobile manufacturers are not currently set up to run these tests. Importantly, the integration of the MAC system with the vehicle is not comprehended in a sophisticated manner by these procedures. Thermal load technologies could not be directly evaluated. As computer controls grow more sophisticated, they have become a major factor in reducing energy consumption of MAC systems, while also meeting acceptable levels of performance in other vehicle parameters. The bench test procedure does not include sophisticated consideration of these computer control algorithms, and it would not be a simple task to include this important variable. [EPA-HQ-OAR-2010-0799-9487-A1, p.57]

The bench test methodology would be no better than the AC17 methodology in achieving the EPA goal of reasonable verification, and it would probably have deficiencies compared to AC17. The bench test methodology was considered within USCAR, but a vehicle test approach was selected instead because it was more comprehensive and the OEMs had facilities and experienced staffs in place for vehicle testing. Since the AC17 test has shown positive early results, it is preferred over bench testing as the basis for future work on these issues. [EPA-HQ-OAR-2010-0799-9487-A1, pp.57-58]

Once again, even using a bench test approach, the questions to be examined more closely resemble a research program than a traditional vehicle emissions certification program. If necessary, reasonable verification of the menu credit amounts could probably be achieved by a research program using bench test data, and sample-based verification could be used to validate that real improvements were occurring on new vehicles. However, comprehensive testing of every platform or model using this approach would be enormously burdensome, and the bench test approach does not solve the problem of defining baseline performance or standards. Since bench testing offers no clear advantages, we recommend AC17 as the basis for future progress on MAC performance. [EPA-HQ-OAR-2010-0799-9487-A1, p.58]

Conclusion [EPA-HQ-OAR-2010-0799-9487-A1, p.58]

EPA set the stringency of the overall GHG standards based on maximum achievement by the industry of 5.0 g CO_2/mile MAC efficiency credits for cars in 2017, followed by maximum achievement of the 7.2 g CO_2/mile MAC efficiency credits by trucks in 2019. Clearly, this is an ambitious forecast, since it requires that no manufacturer encounter obstacles that preclude achievement of the maximum credit on any of its vehicles. However, the proposed efficiency tests have a high potential to interfere with the achievement of these maximum credit levels. In testing thus far, vehicles with engines below 2.5 liters in displacement have consistently shown only partial achievement of the idle test thresholds. It is not yet clear what achievement levels can be attained on the AC17 test, or how that test may be used. The potential testing burden and/or the planning uncertainties created by these tests may by themselves be sufficient to prevent maximum achievement of these credits. [EPA-HQ-OAR-2010-0799-9487-A1, p.58]

In view of these considerations, we ask that achievement of certain levels on the MAC efficiency tests not be established as a strict requirement in order to gain credits from the MAC technology menu. The credit menu is working, and we expect it to continue to generate significant progress, provided that these test requirements are not allowed to interfere. We will work with EPA and NHTSA to provide “reasonable verification” of this progress through selected vehicle testing and other methods to show that the menu amounts are not overstated, and that commensurate real-world progress is achieved. The mid-term review and the 'check-ins' prior to the mid-term review will provide an opportunity for EPA to review whether a “reporting-only” AC17 test (instead of an AC17 test with thresholds) continues to be adequate. However, the number of tests to achieve this should be far less than proposed in the NPRM. [EPA-HQ-OAR-2010-0799-9487-A1, p.58]

NHTSA should adopt regulatory language that provides equivalent levels of MAC efficiency credits in the CAFE program. We note, however, both the difficulty and the importance of keeping the EPA and NHTSA programs aligned. NHTSA CAFE standards will also be based on maximum achievement of these credits, while the ability to earn other compliance credits to offset MAC efficiency shortfalls will not be the same. [EPA-HQ-OAR-2010-0799-9487-A1, p.59]

Finally, we support including MAC credits in fleet averages in a manner consistent with the proposal for off-cycle credits. [EPA-HQ-OAR-2010-0799-9487-A1, p.59]

Organization: American Honda Motor Co., Inc.

5. A/C 17 Test Concerns

“Baseline vehicle” – In section III. C. 1. b) of the preamble, the AC17 test procedure is described as requiring an OEM “To determine whether the efficiency improvements of these technologies are being realized on the vehicle, the results of an AC17 test performed on a new vehicle model would be compared to a “baseline” vehicle which does not incorporate the efficiency-improving technologies.” Honda believes this is problematic for the following reasons: [EPA-HQ-OAR-2010-0799-9489-A1, p. 4]

- Comparator - It may be impossible to re-create a vehicle without the new technology, and secondly, all-new and completely re-designed vehicles may not have a proper comparison vehicle.
- Fairness – early efficiency is not rewarded, because the prior model (where one exists) is the basis for establishing improvements. If prior models are extremely efficient, only relative improvements are rewarded.
- Test integrity – Test repeatability is yet to be assured. EPA says that OEM only needs to pick one model from vehicles that share common platform. Test result, however, is easily affected by vehicle design, such as window size and design, test cell condition (blower setting, humidity level control), resulting in test result variability. Thus test method that use baseline vehicle cannot be accepted. [EPA-HQ-OAR-2010-0799-9489-A1, p. 4]

AC17 Test Repeatability – In the preamble, the agencies claim that the AC17 test shows good repeatability, however, there were limited laboratories used and limited models. Honda proposes a solution to this issue. Recognizing that the idle test does not have good repeatability, and that the AC17 test data points are not as substantial as they need to be, the agencies could allow OEMs to provide AC17 test data during the MY12 – MY16 period, in lieu of the idle test (with its questionable repeatability) and the threshold concern. AC17 test data would allow OEMs to take advantage of the menu-based credits. This will enable EPA to quickly develop a large dataset of AC17 test results, which will accelerate the adoption of performance-based criteria for AC credits. [EPA-HQ-OAR-2010-0799-9489-A1, p. 4]

The agencies seek comment on the threshold criteria for the AC17 test. Unfortunately, Honda doesn’t have any test data or experience at this point. The previous proposal (allowing AC17 test in lieu of idle test during the MY12- MY16 period) would provide EPA with enough data to make a good determination. Additionally Honda proposes that EPA work with SAE Interior Climate Control Committee to establish appropriate thresholds values. [EPA-HQ-OAR-2010-0799-9489-A1, p. 4]

Organization: Association of Global Automakers, Inc. (Global Automakers)

EPA proposes to use a new air conditioning test procedure (AC17) to evaluate potential credits for system efficiency improvements by manufacturers. However, it is clear that there could be problems resulting from the use of the new test. EPA states that “the appropriateness of the test is still being evaluated” and “EPA believes that more testing and development will be necessary before the new test could be used directly …” See 76 FR 74938, 74940. Global Automakers has several concerns with AC17 test procedure, which we recommend that EPA address before the test procedure is required by the regulations. For instance, it is not clear if the precision of the AC17 test procedure is high enough to differentiate between the baseline vehicle and the vehicle enhanced with A/C energy saving technologies. If the total precision of the vehicle test is 2 g CO_2/mi and the enhanced vehicle has A/C-related technologies with menu credits worth that amount or less, the benefit may not be identifiable at all on the vehicle test. Moreover, it is not clear that it would be practicable to use the AC17 test to compare the performance of certain vehicles with and without the individual efficiency improvements from the EPA menu installed, as proposed by EPA. This would be a problem in particular for vehicles that incorporate efficiency improvements as part of a major redesign or full model change. In those situations, it may not be possible to provide a comparable vehicle having an air conditioning system without the efficiency improvements installed. Another issue may result from the comparison of A/C systems when the “baseline” system is already efficient. It may be difficult to demonstrate improvements between two efficient systems, and it is not clear how to obtain credits for changes that resulted in the improved efficiency for the “baseline” system. [EPA-HQ-OAR-2010-0799-9466-A1, p. 4]

We understand the goal of ensuring that credits given on the menu system for A/C technologies actually translate into real-world emissions reduction and fuel savings on the vehicle. There are different methodologies to evaluate the improvement from A/C technologies including menu systems, bench testing, simulation, and vehicle testing. Each of these has its own merits and challenges. One possible improvement that can be made in the current menu system is to put technical specifications relating to efficiency for the individual component technologies. Other options may also be appropriate. Nevertheless, the test procedure concerns should be addressed before implementation. [EPA-HQ-OAR-2010-0799-9466-A1, p. 4]

Due to these potential problems, we urge the EPA to collaborate with the SAE Interior Climate Control Committee to evaluate options to improve the test procedure and to reassess the test procedure as part of the mid-term review. In the interim, we recommend that EPA include in the final rule an “off-ramp” procedure to allow the determination of air conditioning credits without using the AC17 test procedure. [EPA-HQ-OAR-2010-0799-9466-A1, p. 4]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 51.]

Second, the agencies should carefully consider the relationship between the creation of incentives under the new standards and the development of alternative test procedures to assess the incentivized technologies. Global Automakers strongly supports incentivizing technologies whose potential benefits are not fully measured under the 1975 CAFE test procedure. Air conditioning efficiency, off-cycle, and advanced technology incentives are justified based on their potential long term, real world benefits. Such incentives will typically take the form of compliance credits that are assessed using alternative test procedures. In developing incentives for the final rule, the agencies need to carefully consider how to reconcile these incentives with the testing procedures required by law. [EPA-HQ-OAR-2010-0799-9466-A1, p.2]

[[This comment can also be found in Outline Heading 7.4.]]

Organization: BMW of North America, LLC

Regarding fuel efficiency credits, we provide the following comments and recommend some specific changes.

• AC-idle:

- We support the review of AC-idle judgment limits as a function of engine displacement.

- This also supports implementing fuel efficient technologies in smaller vehicles even when fuel consumption improvements which definitely have positive effects during overall typical driving conditions - are not fully visible during small engine idling. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 2]

• AC17 Test and Evaluation:

- We carried out our own AC17 tests after the publication of the NPRM. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 2]

- In our opinion, the AC17 test conditions do not reflect typical average or moderately increased air conditioning loads. In particular, the solar load is too high. According to a FAT study, the average North American sun load is around 310 Wfm2 already taking into account that driving time periods are variable during a day (e.g. less driving at night). We therefore would expect a maximum value of around 350 Wfm2 to 400 Wfm2 (instead of 850 Wfm2) for the AC17 test. Some of the powerful measures to lower all-the-year fuel consumption also can't be evaluated at the currently suggested AC17 test load - e.g. significant reduction of reheat. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 2]

- Reliability of test data is expected to be not better but similar to the AC-idle-test.

- Definition of platforms or carlines could be adopted according to the Alliance proposal. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 2]

- We are also concerned about determining fuel consumption improvements and credit calculations depending on baseline test results. The generation of baseline car results needs to be properly defined. BMW does not have baseline cars - especially focused on 2017 – they have to be designed and built up for this single test. Therefore, we propose to test a baseline car once for each platform - according to the Alliance carline definition - and the use of these baseline results should be allowed during the entire model year 2017 to 2025 timeframe. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure pp. 2-3]

• AC17 Test Procedure:

- During the 30 minute soak, it is quite difficult to control temperature and humidity properly. A wider tolerance range in this phase of the cycle would help. Even more critical for some modern full automatic test benches is the combination of engine off and 4 mph wind speed because this has significant impact on exhaust gas analysis measurement devices. We would prefer a soak definition with a wider tolerance range of temperature and especially humidity and a speed definition of maximum 4 mph (instead of exactly 4 mph). [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 3]

- Solar load during MAC off phases causes extreme temperature exposure to test drivers. These working conditions are unacceptable and will lead to poor accuracy when trying to meet the given drive cycle requirements. We suggest running MAC off phases without solar load. As MAC is turned off, this has no impact on MAC off fuel consumption. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 3]

- Drive cycle definitions should be fully equal to currently used cycles (e.g. some seconds time shift @ HWFET). This would help to keep accuracy and test quality high and to avoid mistakes. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 3]

Organization: Chrysler Group LLC

Air conditioning system efficiency improvements differ between passenger cars and light-duty trucks. It is appropriate to establish separate credit levels for the passenger car and light-duty truck fleets. The Agencies have developed this split in an environmental and fuel consumption neutral manner. [EPA-HQ-OAR-2010-0799-9495-A1, p. 6]

The air conditioning efficiency idle and AC17 test procedures; [EPA-HQ-OAR-2010-0799-9495-A1, p. 10]

Chrysler supports the Agencies' development of separate passenger car- and light-duty truck-specific credits for air conditioning system efficiency improvements.

In the DJTSD, the Agencies derive passenger car and light-duty truck specific greenhouse gas and fuel consumption benefits associated with air conditioning load demand. Chrysler believes that it is a reasonable approximation that opportunities for improvement on passenger cars will differ from those on light-duty trucks. Therefore, the Agency's proposal to establish separate air conditioning system efficiency improvement credits for passenger cars and light-duty trucks is appropriate. [EPA-HQ-OAR-2010-0799-9495-A1, p. 11]

Organization: Enhanced Protective Glass Automotive Association (EPGAA)

4. EPGAA supports the proposal to add the AC17 test procedure with certain modifications. EPGAA advocates migration toward incorporation of AC load into drive cycles or test procedures which can be determined to produce reasonable correlation with real world performance. While credits are a good first step to recognizing the untapped benefits of heat load reduction, the reality is that the imposed caps and generality of credits will not allow full recognition of the potential benefit. To this end EPGAA acknowledges the proposed AC17 test cycle as a potential good advancement. There is always some question as to the validity of sun lamps to simulate true solar load due to incident angle and emitted spectra variances. However, it is also recognized that a repeatable outdoor test, which would be the ideal solution, is difficult to

achieve. Regarding the specifics of the AC17 proposed test protocol, EPGAA would like to offer the following comments: [EPA-HQ-OAR-2010-0799-9301-A1, p. 2]

a. EPGAA suggests that the solar soak period time be increased from 30 minutes to 40-45 minutes. Studies have shown that consumer do indeed leave their vehicles parked for longer than 30 minutes, and thermal modeling of some typical passenger vehicles with RadTherm software shows that at 30 minutes there is still a fairly steep slope of cabin temperature increase occurring in many cases. This slope does tend to taper after about 45 minutes. [EPA-HQ-OAR-2010-0799-9301-A1, pp. 2-3]

b. EPGAA supports the test condition of a 72 degree set point for automatic climate control systems but has concerns regarding the control logic for manual systems. Any protocol selected for the manual systems should be validated by testing a similar or same vehicle configuration equipped with an automatic system and subsequently with a manual system and confirming that both procedures provide the same or similar results. Regarding the proposed manual system procedure, EPGAA agrees that the test should begin at full output with recirculation and also agrees that at some reasonable time period the fan speed should be moderated. It is also agreed that the recirculation mode should be defeated after the vehicle attains a comfort level. It is EPGAA's recommendation that this adjustment point should be triggered by internal cabin temperature rather than simply based on time. Using the temperature control to moderate air supply temperature seems flawed as most manual temperature controls when in fresh air mode moderate supply temperature by adjusting a mixing damper to introduce partial reheat through the heating coil. This will not necessarily result in a true reduction of AC load or hence measurement of the attainable efficiency. The AC compressor in most systems will cycle based on evaporator coil temperature. Introducing mixed air will ultimately increase evaporator sensible load to remove the reheat energy resulting in a poor measure of any heat load reduction improvement as the compressor will not shut off as often as was possible without reheat. In this scenario, any technology which reduces heat load in the cabin will trigger a response to increase the temperature setting which will simply increase the amount of reheat energy. EPGAA suggests that for the above reasons, the temperature control must remain in the full cold position during the test cycle and cooling air supply should only be regulated via fan speed. The fan speed should be adjusted as required at intervals to hold an interior temperature. Furthermore, EPGAA suggests that the adjustment should be based on a breath level cabin temperature reading, rather than the supply air temperature at a duct outlet, since this will be more representative of the usage by an actual driver. [EPA-HQ-OAR-2010-0799-9301-A1, p. 3]

Organization: Ferrari

To reduce the certification test burdens for small-volume manufacturers, we request that the A/C Idle Test could be used (instead of the new AC17 test) beyond MY 2016. At least, the transition from the A/C idle test to the AC17 should be smooth. [EPA-HQ-OAR-2010-0799-9535-A2, p.13]

Organization: Ford Motor Company

We also support proposed changes to the program for 2014-2016 MYs that will allow manufacturers to earn credits by reporting results from the new AC17 test, which Ford helped to develop jointly with industry (USCAR), EPA and CARB. This option has two primary benefits. First, it provides a rich source of data for evaluating the new AC17 test, prior to its proposed 2017 MY implementation. Second, it provides an alternative to the Idle Test, which has several shortcomings, as detailed in the Alliance comments as well as in the NPRM preamble and Technical Support Document. [EPA-HQ-OAR-2010-0799-9463-A1, pp. 10-11]

Ford also supports the introduction of the AC17 test procedure as a means of validating credit values for the 2017-2025 MYs. As mentioned, Ford has worked with industry and the agencies to develop this procedure and will continue to work with these groups in the future to conduct additional prove-out on this test. We do however, have some concerns with the 2017-2025 MY test requirements, as proposed: [EPA-HQ-OAR-2010-0799-9463-A1, p. 11]

While the AC17 test is much improved over the Idle Test, we believe that the addition of this test is more suited for a research program to validate menu levels, rather than a certification-type test requirement. Variability with this test has been reduced, but remains a concern. The charts below show that using a single baseline and demonstration test may not always successfully show the technology benefit. On the left side of the first chart, test data from a base test, without recirculation, and two tests with recirculation technology are shown. On the right side of that chart, the difference in CO_2 emissions between the base test and the two recirculation tests are provided. Based on this data, one of the recirculation tests does not show an improvement over the baseline. If this single test were run for certification, no credit would have been earned for a technology that clearly should provide a benefit. This shows the importance of running multiple repeats when demonstrating the benefits of these technologies. The second chart below shows that when multiple baseline and "with technology" tests are averaged and compared, the benefit of the recirculation technology is seen and can be quantified. This shows that reliance upon one test point may not adequately demonstrate an accurate credit level, nor does it allow for acceptable credit planning assessments. Without the ability to reliably estimate credit levels during the planning process, decisions to introduce these beneficial technologies will be jeopardized. [EPA-HQ-OAR-2010-0799-9463-A1, p. 11]

For certification, the concept of comparison testing a vehicle containing the A/C new technology with a similar "baseline vehicle" without the technology will be difficult to accomplish in practice. When manufacturers introduce new A/C technology, these changes typically take place when other updates are being made to the vehicle. As a result, a comparison of the older baseline vehicle to the new vehicle may be influenced by factors other than simply the A/C system changes. In general, it is also not rational to test a vehicle with the A/C technologies deactivated as a baseline. In many circumstances this is impossible, or would require a great deal of effort to accomplish, and would not be optimized for performance. Therefore, it may be difficult to identify reasonable baseline vehicles, especially given the large number of tests that are proposed to be required for each model year. In the interest of validating menu levels, a more limited number of comparison tests should be conducted to evaluate the different A/C technologies, with multiple test runs to statistically verify results. This could be done as a research program using industry and agency data collected prior to 2017 MY. Once that work is complete, we recommend that credit levels be awarded on the basis of that validated menu (similar to the current process, as well as the proposed off-cycle pre-approved technology list). Additional testing should then be limited to survey or confirmatory purposes or for the evaluation of new technologies. [EPA-HQ-OAR-2010-0799-9463-A1, p. 13]

Ford believes the testing burden associated with the new requirements is excessive, as proposed. EPA acknowledges that the AC17 test requires a significant amount of time, using expensive SC03-capable facilities, and therefore suggests this testing should be conducted on a limited subset of vehicles. The proposal indicates that one vehicle (plus the baseline) per platform must be tested. Based on the proposed platform definition, this is problematic because each platform is required to have a common body floor plan, chassis, engine and transmission. Ford’s product line-up would result in an extremely large number of required tests. For example, using the proposed definition on Ford's 2012 MY line-up would result in up to 63 platforms. For 2013 MY, the number of platforms increases to 66. We do not expect elements like powertrain and transmission to have any significant impact on the benefits of the A/C technologies and therefore believe the scope of the platform definition should be narrowed. If testing requirements are determined on a platform-basis, we agree with the definition proposed in the Alliance comments, included below for reference: [EPA-HQ-OAR-2010-0799-9463-A1, p. 13]

Platform means a group of vehicles within an OEM which has a degree of commonality in construction (e.g., body, chassis). Platform does not consider the model name, brand or marketing division, does not consider any level of decor or opulence and also does not consider characteristics such as roof line, number of doors, seats, or windows. A platform may include vehicles from various fuel economy classes, including both cars and trucks. [EPA-HQ-OAR-2010-0799-9463-A1, p. 13]

Using this updated definition would reduce Ford’s platform counts to 10 and 9 for the 2012 and 2013 MYs, respectively, which is much more reasonable than the number that would be required using the definition proposed in the NPRM. [EPA-HQ-OAR-2010-0799-9463-A1, p. 13]

Ford also requests the option of allowing manufacturers to use additional instrumentation for collecting PCM and other A/C control data during the AC17 testing to study parameters and better understand what occurs during the test. This should be an allowable option, but not a requirement for recording or reporting. [EPA-HQ-OAR-2010-0799-9463-A1, p. 13]

Ford also supports all of the suggested technical corrections and recommended test procedure and tolerance updates to the Idle Test and AC17 Procedures in sections 40 CFR § 86.165-12 and § 86.167-17, as detailed in the Alliance comments. [EPA-HQ-OAR-2010-0799-9463-A1, p. 14]

To summarize, Ford believes the inclusion of the new AC17 test is a major step in the right direction for helping to quantify A/C technology benefits. As indicated by the above comments, additional work remains to resolve various technical and logistical issues for using this test to validate credit levels. Ford is committed to continuing our cooperative work with industry and the agencies to make the use of this test a success and allow for proper credit achievement with planning certainty. As that development work continues, we urge the agencies not to finalize a rule that will establish overly burdensome test requirements or thresholds for achieving maximum credit levels that have not yet been fully proven out. [EPA-HQ-OAR-2010-0799-9463-A1, p. 14]

Organization: Guardian Automotive Products, Inc.

Guardian advocates migration toward incorporation of AC load into drive cycles or test procedures which can be determined to produce reasonable correlation with real world performance. While credits are a good first step to recognizing the untapped benefits of heat load reduction, the reality is that the imposed caps and generality of credits may not allow full recognition of the potential benefit. Nonetheless, the proposed AC17 test cycle appears to be a step in the right direction. Sun lamps in test chambers do not represent an ideal duplication of real world solar load; however, they are perhaps the best available compromise given the difficulty of establishing a repeatable outdoor test. Guardian offers the following specific comments regarding the proposed AC17 cycle: [EPA-HQ-OAR-2010-0799-9299-A1, p. 2]

• The solar soak period time should be increased from 30 minutes to 40-45 minutes. Thermal modeling of various passenger vehicles with RadTherm software demonstrates that at 30 minutes there is still in many cases a fairly steep slope of cabin temperature increase. This slope tends to taper only after about 45 minutes. [EPA-HQ-OAR-2010-0799-9299-A1, p. 2]

• We understand the rationale behind the proposed test condition of a 72 degree set point for automatic climate control systems left to operate during testing in fully automatic mode. However, we have concerns regarding the proposed control logic for manual systems. Any protocol selected for manual systems should be verified by testing a similar or same vehicle configuration equipped with an automatic system to ensure that the manual system results are similar to those of the automatic system. Regarding the proposed manual system procedure, Guardian agrees that the test should begin at full output with recirculation and that at some reasonable time period the fan speed should be moderated. We also agree that the recirculation mode should be defeated after the vehicle attains a comfort level, but this adjustment point should be triggered by internal cabin temperature and not a set time period. Using the temperature control to moderate air supply temperature seems flawed as most manual temperature controls when in fresh air mode moderate supply temperature by adjusting a mixing damper to introduce partial reheat through the heating coil. This will not necessarily result in a true reduction of AC load or, therefore, measurement of the attainable efficiency. The AC compressor in most systems will cycle based on evaporator coil temperature or humidity level. Introducing mixed air will ultimately increase evaporator sensible load to remove the reheat energy resulting in a poor measure of any heat load reduction improvement as the compressor will not shut off as often as was possible without reheat. In this scenario, any technology which reduces heat load in the cabin will trigger an operator response to increase the temperature setting which will simply increase the amount of reheat energy. Guardian suggests that for the above reasons the temperature control must remain in the full cold position during the test cycle and cooling air supply should only be regulated via fan speed. The fan speed should be adjusted as required at intervals to hold an interior temperature. Furthermore, Guardian suggests that the adjustment should be based on a cabin temperature reading near one of the headrests rather than the supply air temperature at a duct outlet since this will be the control input temperature for an actual driver. [EPA-HQ-OAR-2010-0799-9299-A1, pp. 2-3]

Organization: Honeywell International, Inc.

Consequently, the agencies propose to require manufacturers to use the new Air Conditioning, 2017 ('AC17') tests to demonstrate that new or improved A/C technologies actually result in efficiency improvements, while continuing to use the menu-style approach to determine credits and fuel consumption improvement values. [EPA-HQ-OAR-2010-0799-9497-A1, p.9]

Honeywell agrees that a performance-based test is preferable to the proposed menu-style approach because it could quantify more accurately the degree of improved efficiency resulting from an A/C system, thus providing a more precise measurement of GHG emissions reduction and CAFE fuel consumption value. Honeywell believes that by locking in the vehicle menu approach for the next 13 years, EPA and NHTSA could prevent the use of new and improved performance tests developed during the life of the Proposed Rule. Although EPA and NHTSA are obligated to conduct a separate rulemaking for MY 2022-2025 standards, Honeywell maintains that the proposed midterm review is still too far into the future to exclude new performance tests and recommends providing opportunity for more frequent updating in the final rule. [EPA-HQ-OAR-2010-0799-9497-A1, p.9]

Honeywell offers that EPA and NHTSA should not require manufacturers to use the AC17 test to demonstrate the effectiveness of their A/C efficiency technologies until that test has been thoroughly evaluated. It is our understanding that EPA and NHTSA propose the use of the four-part AC 17 performance-based test to quantify efficiency improvements as a prerequisite for access to the credit menu. However, EPA and NHTSA note that they are not proposing to replace the credit menu with the AC 17 test because the test 'is still being evaluated.' Although Honeywell generally prefers the use of a performance-based test when practicable, Honeywell discourages the required use of a new test until the agencies can verify the test's accuracy and reliability. Honeywell suggests that EPA and NHTSA either conduct more frequent reviews or develop a method to evaluate industry suggestions for potential performance tests and to incorporate them as they deem appropriate. [EPA-HQ-OAR-2010-0799-9497-A1, pp.9-10]

Honeywell Agrees with the Use Of SAE Standard J 2765 to Establish the Credit for Improved Evaporators and Condensers, which EPA Required Specifically for MY 2012·2016 Vehicles, and Suggests that EPA Expressly Require Its Use for MY 2017·2025 Vehicles as well [EPA-HQ-OAR-2010-0799-9497-A1, p.10]

EPA and NHTSA propose an A/C Efficiency Credit for the use of improved evaporators and condensers. EPA and NHTSA state in the TSD that the credit will be based upon SAE Standard 12765 - Procedure of Measuring System Coefficient of Performance of a Mobile Air Conditioning System on Test Bench Honeywell agrees that Standard J 2765 is the appropriate method for showing improvements in the energy efficiency and cooling capacity of systems. EPA and NHTSA do not specify, however, in the Proposed Rule, as EPA did in final rule establishing vehicle emissions and fuel economy standards for MY 2012-2016 vehicles, that the credit for improved condensers and evaporators must be determined using the bench test procedures described in SAE 12765. To ensure compliance with this requirement, Honeywell suggests that EPA and NHTSA specify expressly in the rule, in addition to the TSD, that the credit shall be determined using the SAE 12765 bench test procedures. [EPA-HQ-OAR-2010-0799-9497-A1, p.10]

Honeywell proposes that EPA employ SAE Standard J 2765 for calculation of the oil separators credit [EPA-HQ-OAR-2010-0799-9497-A1, p.10]

EPA and NHTSA propose a credit for manufacturers if they prevent oil from circulating throughout the A/C system due to inefficiencies resulting from heat transfer effectiveness. Honeywell agrees that large amounts of oil circulating throughout the system can negatively impact the efficiency of a system, but we disagree that adding an oil separator will necessarily improve efficiency. For example, an improperly designed oil separator could negatively impact the system's efficiency by restricting the flow of refrigerant through the device, resulting in increased pressure losses. [EPA-HQ-OAR-2010-0799-9497-A1, p.10]

Relying on the SAE IMAC team, EPA and NHTSA estimate a standard credit of 0.6 gram/mi CO_2. Instead, Honeywell suggests that the efficiency improvements of oil separators can be measured identically to evaporators and condensers by using SAE Standard 12765 - Procedure of Measuring System CO_2 of a Mobile Air Conditioning System on a Bench Test. Using SAE Standard 12765 will enable manufacturers to more accurately determine the overall efficacy and resulting credit of their component technology. [EPA-HQ-OAR-2010-0799-9497-A1, p.11]

Organization: Hyundai America Technical Center

However, Hyundai has concerns with the new AC17 A/C test procedure that allows manufacturers to evaluate potential credits for A/C efficiency improvements. Since the new AC17 test procedure has not yet been fully developed, Hyundai recommends that EPA retain the idle test as an option until the AC17 procedure has been proven to be reliable rather than requiring the use of AC17 procedure beginning in 2017. [EPA-HQ-OAR-2010-0799-9547-A1, p.6]

2) Hyundai questions the requirement that automakers conduct back-to-back tests with and without the credit-generating technologies to determine potential credits. There may be a number of scenarios which make it impossible to test without the credit-generating technologies, particularly on a full model changeover. For this reason and for consistency, the baseline vehicle should be clearly defined. Unless the baseline is defined, some manufacturers could be comparing their new A/C technologies against a highly efficient system and generate minimal credits while another could be comparing against a less efficient system and show greater improvement. Hyundai supports the recommendation made in the Global Automaker's comments which would be to rely on the Society of Automotive Engineers (SAE) Interior Climate Control Committee to determine the appropriate baseline A/C systems and address any test procedure concerns prior to implementation of requirements. [EPA-HQ-OAR-2010-0799-9547-A1, p.7]

Organization: International Council on Clean Transportation (ICCT)

ICCT also supports combining the menu of credits for specific A/C technologies with manufacturer performance testing to justify application of these credits. Creating a menu of credit values will help quantify emission reductions for components/technologies that may be hard to quantify through testing individually, while performance testing will verify that an effective overall package meets the minimum threshold for improvement and achieves the claimed emissions reductions. We encourage US EPA's continued work to improve the A/C test procedures in parallel with the rulemaking effort. [EPA-HQ-OAR-2010-0799-9512-A1, p. 37]

We note that the USEPA/NHTSDA November 2011 draft TSD (page 5-51) suggests that only one or two vehicles per year may be tested per manufacturer on average. Given the wide range of changes in new product offerings, engine technology, A/C system operations, and alternative refrigerants, we believe that each significantly changed model should be tested. We recommend deleting this statement in the final TSD. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 37-38]

Organization: Kia Motors

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 101-102.]

Kia supports the use of A/C menu for determining air conditioning system credits but supports an increase in the maximum amounts of credits permitted if we were able to demonstrate an emission reduction greater than the items provided in the menu. However, since the new AC17 test procedure has not yet fully been developed, Kia recommends that EPA retain the idle test as an option until the AC17 has been proven to be more reliable rather than requiring the use of the AC17 procedure at the beginning of 2017.

Organization: Mercedes-Benz USA, LLC

In particular, we endorse the concept of reviewing the A/C idle values with regard to small displacement engines, where fuel consumption improvements may be less visible during idling. With regard to the proposed A/C 17 test, DAG is concerned that the test conditions do not reflect typical, or even moderately elevated, A/C loads. For example, a 2008 German study of vehicles in over 3200 counties in the United States found that the average solar load in the U.S. is below 350 W/m2 rather than the 850 W/m2 . DAG is concerned that, given these more typical loads, the most effective ways to reduce annual MAC fuel consumption may not be recognized or evaluated through the proposed A/C 17 test procedure.[6] [EPA-HQ-OAR-2010-0799-9483-A1, p. A-3]

DAG has a number of additional suggestions with regard to the proposed test procedures. These include wider tolerances for the climate parameters during the soak period, as it is difficult to maintain temperature and humidity within the proposed tolerances. A wider tolerance range can be provided without impacting results. A wind speed lower than 4 mph should also be established since such a wind speed would improve the accuracy of the exhaust gas measurement. Drive cycle definitions should also be consistent with currently used cycles to retain accuracy and reduce failures. Correction factors should be applied to retain accuracy. First, a correction factor is necessary to overcome the fact that fuel consumption from the MAC system is calculated as the difference between two measured values that are approximately an order of magnitude larger than the MAC fuel consumption value. Second, the expected efficiency differences related to technical measures, component enhancements and refrigerant circuit optimization would fully be hidden by the effect of ambient and operating conditions deviations. Therefore, correction factors are needed to recognize ambient enthalpy, system settings and driving variations. We also propose that the HVAC system be adjusted at the beginning of the preconditioning stage of the MAC test cycle, that target temperatures be defined to meet the target temperature and mass air flow values, that A/C recirculation be allowed if recirculation is the default, and that the settings of all vent flaps be specified. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-3]

Rather than attempting to correlate the cabin volume and the cabin temperature level during the test, DAG suggests that a correction factor be deduced based on vehicle size and later applied to the measured MAC fuel consumption. This would allow consideration of vehicle cabin sizes and allow all vehicles to be tested with the same MAC settings. Finally, we suggest that the Tts value for each glazing plane be calculated in accordance with ISO 13837. This allows glazing quality and angle to be accounted for in the Tts value. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-4]

We look forward to working with the agencies as the A/C 17 test procedure is further refined and fully support the effort to promote more efficient MAC systems. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-4]

---

6 We are also concerned about unacceptable work place conditions for the test bench personnel due to solar radiation during that portion of the MAC test conducted with the A/C off. We therefore recommend that the MAC test be conducted without solar radiation during both the A/C off and the A/C on portions of the test.

Organization: Mitsubishi Motors R&D of America, Inc. (MRDA)

Recommends the AC17 test on a reporting only basis to verify air conditioning (A/C) efficiency improvements as an option in MYs 2014 through 2016, and after MY 2016, as a replacement for the A/C Idle test. [EPA-HQ-OAR-2010-0799-9507-A1, p.2]

Organization: Pittsburgh Glass Works (PGW)

3. PGW supports the proposal to add the AC17 test procedure to enable an actual measurement of the impact rather than a model-based calculation. PGW recommends certain minor modifications to the proposed AC17 test procedure. The AC17 test procedure calls for a 30 minute soak. PGW recommends a 45 minute soak to better account for “real world” conditions. Cabin temperature after 30 minutes is still deviating between cars with heat load technologies compared to those without. In addition, solar lamps located overhead do not necessarily provide adequate simulation of real world conditions where the sun moves across the horizon over the day. The heat load in the mornings and evenings can be very different from the mid-day sun.

Therefore, PGW recommends that test chambers be modified to include solar lamps on the sides as well as above the vehicle. Finally, the test procedure for cars with manual air conditioning should be modified to require changing the air flow with the cabin temperature rather than temperature of the vent air. A simple procedure could be to measure air temperature at a few locations (three at a minimum – driver breath, passenger breath, and rear seat breath) and use that air temperature to control the air conditioning system. This would be a better simulation of the actual air conditioning use by a consumer. [EPA-HQ-OAR-2010-0799-9300-A1, pp. 2-3]

Organization: Toyota Motor North America

Air Conditioning (A/C) Efficiency Credits [EPA-HQ-OAR-2010-0799-9586-A1, p.13]

Idle Test Thresholds - EPA has proposed to modify the Idle test thresholds from a flat threshold to a function of engine displacement. Toyota recommends that an additional threshold be considered for dual A/C systems. Under the proposed threshold, it will be difficult for a dual A/C system employing state of the art high efficiency technology to comply. Toyota recommends that the threshold for vehicles equipped with dual A/C systems be increased to a value of 19 g/minute. [EPA-HQ-OAR-2010-0799-9586-A1, p.13]

AC17 Test General- Toyota appreciates EPA's flexibility in allowing manufacturer's to run the AC17 test for 2014-2016 model years as a reporting option, in lieu of the Idle test requirements~ while still allowing credits to be generated from the menu. However, EPA has proposed AC17 testing be required to generate credits starting with the 2017 model year. Toyota remains concerned with the proposed AC17 test because its complexity will require 8 hours from set-up to completion. In addition, the proposed AC17 testing for 2017 model year requires testing in each year and on each platform that would receive credit, which would quickly create an inordinate test burden. In order to reduce this burden, Toyota requests that EPA consider flexibility when addressing carry over allowances, test group configurations, and testing requirements. [EPA-HQ-OAR-2010-0799-9586-A1, p.14]

Technical Recommendation -Toyota supports the corrections and clarifications provided in the Alliance comments. In addition~ per AC17 test procedure §86-167-17 (e)(2) regarding manual A/C systems, a manufacturer must manually adjust the airflow setting to 'outside-air' at the first idle period of the SC03 drive cycle, even if the airflow setting is automatically set to "recirculated-air" by systems having automatic recirculation control technology. Toyota requests to add the option that if the system is equipped with automatic recirculation control~ then it is not necessary to change the airflow setting to 'outside-air' at the first idle period of SC03 drive cycle in AC17 test. Toyota thinks this recommended option would be consistent with EPA's current consideration for A/C systems. As an example, EPA currently allows 'default to recirculated air with closed-loop control of the air supply whenever the outside ambient temperature is 75F or higher' as an efficiency improvement to current A/C systems. [EPA-HQ-OAR-2010-0799-9586-A1, p.14]

Organization: Volkswagen Group of America

CREDITS FOR EFFICIENCY IMPROVEMENTS

Volkswagen disagrees with the agencies modifications to the credit levels available for efficiency improvements within the 2017-2025 proposal. Previously in 2012-2016, both cars and trucks were eligible for up to 5.7 g/mi CO_2 credit. Within this proposal, the agencies have decreased the maximum level of car credit to 5.0 g/mi and increased the maximum truck credit to 7.2 g/mi. Volkswagen understood that it was the intention of the agencies to continue the base flexibilities from 2012-2016 into the 2017-2025 timeframe. The decrease in passenger car and increase in truck credits contrasts with this understanding. [EPA-HQ-OAR-2010-0799-9569-A1, p. 30]

It is Volkswagen's position that A/C loading is a function of vehicle attributes rather than compliance category. Vehicle mass, interior volume, glazing, etc will determine loading requirements and the effects of efficiency improvements rather than whether the vehicle is a car or truck. In some cases the exact same A/C system between related or similarly sized cars and trucks. Improvements made to particular A/C system would then be integrated into both the car and truck at the same point in production. [EPA-HQ-OAR-2010-0799-9569-A1, p. 30]

Efficiency is a reduction in energy use which is independent of the type of vehicle. Trucks will feature greater total lifetime CO_2 reductions due to the expected higher VMT, however in terms of rate (g/mi) there may not be any difference between cars or trucks. [EPA-HQ-OAR-2010-0799-9569-A1, p. 30]

We simply fail to see enough technical evidence to broadly apply a 2.2 g/mi difference, especially for two vehicles in different categories which have the same A/C system. Volkswagen proposes that the maximum credit levels for cars and trucks are equalized at 7.2 g/mi. As an alternative, an average g/mi reduction could be calculated for the fleet as a whole and applied equally for cars and trucks. [EPA-HQ-OAR-2010-0799-9569-A1, p. 30]

IDLE TEST CONDITIONS

As stated within the Alliance comments, the idle test procedure requires the air conditioning system to be operated as if they were working at a high ambient temperature. Thus the air conditioning system will work at maximum 'cool down' for a majority of the testing time. These temperature conditions are unrealistic and prevent the test from reflecting efficiency gains possible at moderate and light load. As demonstrated by the SAE/IMAC study, the efficiency improvements at moderate and light loads are 40% or more. The idle test conditions should be adapted to include efficiency gains at moderate and light loads within the overall result. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 30-31]

Volkswagen maintains that there are significant test-to-test repeatability issues with the idle test due to test cell influences (air movement, etc). Volkswagen requests that EPA provide more clearly defined testing parameters to improve the repeatability of the test. Volkswagen has conducted internal evaluations of the idle test and would welcome the opportunity to provide input on how to improve the definition of these test parameters. [EPA-HQ-OAR-2010-0799-9569-A1, p. 31]

IDLE TEST ENGINE DISPLACEMENT FACTOR

EPA has included within the proposal an idle test threshold adjustment based on engine displacement. Volkswagen supports the overall comments from the Alliance on the minimal contribution of this change to the higher level goals of real world GHG reductions. Volkswagen considers this option as a transitional provision until the AC 17 test will be used to quantify MAC system efficiency. Volkswagen seeks to clarify that the optional use of this provision is at the discretion of the manufacturer, e.g. by model type. [EPA-HQ-OAR-2010-0799-9569-A1, p. 31]

AC 17 TESTING AND VEHICLE SELECTION

Volkswagen fully supports the concerns over the complexity, length and therefore time and costs to run the AC 17 test. Furthermore, there may be difficulties in establishing baseline results from which to compare a vehicle equipped with a new A/C system. It is often the case that a new A/C system will be integrated into a vehicle which has also undergone a significant refresh, or even a complete redesign. In this case, it will be difficult to implement an 'old' baseline A/C system in a 'new' redesigned car in order to properly establish before/after results. Therefore Volkswagen agrees with the alliance proposal to utilize the AC17 test solely to validate menu credit amounts and monitor progress. Another option would be to consider the possibility of establishing an industry baseline value. [EPA-HQ-OAR-2010-0799-9569-A1, p. 31]

Volkswagen proposes the following definition of a 'vehicle platform' and to restrict the required testing to a platform. [EPA-HQ-OAR-2010-0799-9569-A1, p. 31]

Platform means a group of vehicles within an OEM which has a degree of commonality in construction (e.g., body, chassis). Platform does not consider the model name, brand or marketing division, does not consider any level of decor or opulence and also does not consider characteristics such as roof line, number of doors, seats, or windows. A platform may include vehicles from various fuel economy classes, including both cars and trucks. [EPA-HQ-OAR-2010-0799-9569-A1, p. 31]

Volkswagen supports the concept of eventually allowing the use of detailed simulation as an accepted analysis tool in helping to determining credit levels. Simulation tools are broadly applied within the vehicle development process and have proven valuable in both enabling faster analysis and lower costs. We request EPA to consult with SAE in order to fully explore this route. [EPA-HQ-OAR-2010-0799-9569-A1, p. 31]

Organization: Volvo Car Corporation (VCC)

VCC supports the use of the complete vehicle test cycle AC17 instead of the A/C Idle ON/OFF test, but would like to see a harmonization of the complete vehicle test cycle AC17 (within the US) and the European MAC efficiency test cycle. VCC proposes this to keep the number of tests at a minimum because these tests are very resource demanding. [EPA-HQ-OAR-2010-0799-9551-A2, p. 8]

The new GHG regulations have led to substantial enhancements of several test procedures, all to achieve more real and credible results. However, it is important that EPA and NHTSA, in cooperation with CARB, also realize that these complex test procedures may result in excessive costs for manufacturers. VCC therefore asks that EPA and NHTSA, in cooperation with CARB, recognize that the SC03 test is a much more complex test format and requires a unique test facility, and that manufacturers today have limited capacity. Consideration also should be given to how critical these tests are, with a view to limiting the number of tests that are required, while achieving quality results in order to identify the efficiency of AC systems. [EPA-HQ-OAR-2010-0799-9551-A2, p. 8]

The AC17 test is a long, expensive and complicated test, so it is essential that the number of tests should be kept to a reasonable and manageable level. The AC17 test takes approximately four hours, which is eight times as long as the AC Idle test. The AC17 test requires more technician time to set up the elaborate instrumentation, and it requires SC03 climate-controlled test cells. [EPA-HQ-OAR-2010-0799-9551-A2, p. 9]

For future technologies, VCC supports the utilization of a system bench test to measure energy efficiency of an AC system. In future advanced technology vehicles, active AC cooling of the battery pack could be necessary. Therefore, for this type of vehicle a complete vehicle test such as the AC17, could prove to be difficult to achieve the necessary repeatability, because it would require keeping track of the environment of the battery pack during the test. [EPA-HQ-OAR-2010-0799-9551-A2, p. 9]

VCC supports the new method for attaining efficiency credits. VCC thinks that the so-called credit menu for energy efficient AC system components is somewhat misleading. VCC considers that a combination of different technologies in the credit menu could give advantages or disadvantages in AC system efficiency depending on how the combination is made. [EPA-HQ-OAR-2010-0799-9551-A2, p. 9]

VCC's opinion is that the amount of credits should be a result of a suitable full vehicle test or bench test. [EPA-HQ-OAR-2010-0799-9551-A2, p. 9]

Response:

EPA acknowledges the general support for a more comprehensive vehicle-based test for generating A/C efficiency credits, AC17, instead of the Idle Test. We also recognize the manufacturer and industry concerns regarding the burden and accuracy of such a test. As such, we have incorporated changes regarding ambient temperature and humidity tolerances the environmental test chamber (see TSD Section 5.1.3.6). Modifications regarding the tolerances for test cell ambient conditions on the Idle Test have been incorporated as well (see TSD Section 5.1.3.5). Regarding the burden of the AC17 test, we have implemented a program where a maximum of one AC17 test per vehicle platform will be required in a given model year, with the ability to carry forward the AC17 test result and A/C credits to future model years. We believe that this revision addresses concerns about the number of tests that will need to be performed in order to generate credits, while appropriately ensuring sufficient testing to confirm that new technologies are reducing CO_2 emissions as expected. The details regarding the determination of how many AC17 tests a manufacturer will need to submit upon certification (see preamble Section II.F.1.b.ii and III.D and TSD 5.1.3.8).

In response to comments concerning the accuracy (and test-to-test repeatability) of the AC17 test, EPA believes that our testing of production vehicles has shown that with proper control of the test cell conditions, the AC17 test cycle is capable of producing results that can demonstrate differences in A/C load, which are then reflected in tailpipe CO_2 emissions. Our analysis of these test results is found in TSD 5.1.3.7. In addition, our memo to the docket (see Docket Number EPA-HQ-OAR-2010-0799) describing the results of USCAR testing -- in which the effect of specific A/C technologies are evaluated relative to a baseline technology -- also supports our position that the AC17 test is capable of quantifying the effect of efficiency-improving technologies. While the USCAR test results may lack the number of repeat tests necessary to establish a reduction in CO_2 emissions, these preliminary and developmental results serve to demonstrate that the effect of the efficiency-improving technologies is always in the direction of lower A/C-related CO_2 tailpipe emissions relative to a baseline technology.

In regard to comments which suggested different A/C system control settings or adjustment of control settings based on actual interior temperature readings, we believe that such changes would add complexity to the test and could result in greater test-to-test variability, as interior temperatures can be airflow- and vehicle-dependent, and language to define precise, repeatable positioning of vents (which would affect the interior temperature reading) is not feasible at this time. As such, we are finalizing the A/C system control settings that were specified in the NPRM (see TSD Section 5.1.3.6).

4. Incentives for Electric Vehicles, Plug-In Hybrid Electric Vehicles, and Fuel Cell Vehicles

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Clean Skies Foundation (ACSF)
American Council for an Energy-Efficient Economy (ACEEE)
American Fuel and Petrochemical Manufacturers (AFPM)
American Honda Motor Co., Inc.
American Petroleum Institute (API)
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
Borg Warner, Inc.
Center for Biological Diversity
Center for Sustainable Systems, University of Michigan
Ecology Center
EcoMotors International, Inc.
Edison Electric Institute (EEI)
Electric Drive Transportation Association
Ferrari
Fisker Automotive, Inc.
Ford Motor Company
General Motors Company
Growth Energy
Honeywell Transportation Systems
Hyundai America Technical Center
Institute for Policy Integrity, New York University School of Law
International Council on Clean Transportation (ICCT)
Jackson, F.W.
Johnson Controls, Inc.
Magna E-Car Systems
Marz, Loren C.
Mercedes-Benz USA, LLC
Minnesota Department of Commerce
Mitsubishi Motors R&D of America, Inc. (MRDA)
Motor & Equipment Manufacturers Association (MEMA)
National Association of Clean Air Agencies (NACAA)
National Corn Growers Association et al.
National Propane Gas Association (NPGA)
National Wildlife Federation (NWF)
Natural Resources Defense Council (NRDC)
Nissan North America, Inc.
Northeast States for Coordinated Air Use Management (NESCAUM)
Pennsylvania Department of Environmental Protection
Pew Charitable Trusts

Plant Oil Powered Diesel Fuel Systems, Inc.
Porsche Cars North America, Inc. (PCNA)
Renewable Fuels Association (RFA)
Securing America's Future Energy (SAFE)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
South Coast AQMD
Tesla Motors, Inc.
Toyota Motor North America
U.S. Coalition for Advanced Diesel Cars
Union of Concerned Scientists (UCS)
United Automobile Workers (UAW)
Volkswagen Group of America
Volvo Car Corporation (VCC)
Weiner, L.

Organization: Alliance of Automobile Manufacturers

Automakers should not be required to account for utility GHG emissions. The proposed rule indicates that the agencies expect electric vehicles to become an increasingly large part of the car park. Yet the rule leaves open the possibility of requiring manufacturers to account for upstream emissions from electricity generation in the event that the Administration is unable to control these emissions through other channels. In other words, automakers may now be called on to not only make an unprecedented investment into vehicles with lower GHG emissions, but to also fill the void between this rulemaking and a comprehensive national energy policy. If Americans agree that programs to address upstream GHG emissions are appropriate, then such programs should be put in place through appropriate regulation of electricity generators, not by imposing additional burdens on vehicle manufacturers. [EPA-HQ-OAR-2010-0799-9487-A1, pp.4-5]

Dual Fuel Plug-In Hybrid Electric Vehicles (PHEVs) [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

The Alliance supports the continued use of the Society of Automotive Engineers (SAE) cycle-specific utility factor approach for PHEV compliance and label emissions calculations. This utility factor approach provides a method for predicting the fractions of total distance driven in each mode of operation. In this case the modes of operation would be wall electricity from the grid or conventional liquid fuel such as gasoline. [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

Automakers Should Not be Required to Account for Utility GHGs. [EPA-HQ-OAR-2010-0799-9487-A1, p.76]

EPA requests comments on several aspects of its proposal regarding accounting for the carbon emissions from the use of electricity. These include the conversion process, tons accounting, a phase out, costs, the timing, etc. The Alliance strongly recommends that all upstream carbon emissions from the use of electricity be quantified as zero for the purposes of automotive GHG emissions regulations. This should be the case for all model years and for all vehicle volumes. [EPA-HQ-OAR-2010-0799-9487-A1, p.76]

In the NPRM, EPA notes, [EPA-HQ-OAR-2010-0799-9487-A1, p.76]

The tailpipe GHG emissions from EVs, PHEVs operated on grid electricity, and hydrogen-fueled FCVs are zero, and traditionally the emissions of the vehicle itself are all that EPA takes into account for purposes of compliance with standards set under Clean Air Act section 202(a). [EPA-HQ-OAR-2010-0799-9487-A1, p.76]

The Alliance agrees with this statement and further notes that EPA should, in fact, maintain this same logic when dealing with current and future GHG emissions. [EPA-HQ-OAR-2010-0799-9487-A1, p.76]

EPA further states, [EPA-HQ-OAR-2010-0799-9487-A1, p.76]

Focusing on vehicle tailpipe emissions has not raised any issues for criteria pollutants, as upstream emissions associated with production and distribution of the fuel are addressed by comprehensive regulatory programs focused on the upstream sources of those emissions. At this time, however, there is no such comprehensive program addressing upstream emissions of GHGs, and the upstream GHG emissions associated with production and distribution of electricity are higher, on a national average basis, than the corresponding upstream GHG emissions of gasoline or other petroleum based fuels. [EPA-HQ-OAR-2010-0799-9487-A1, p.76]

Again, the Alliance maintains that simply because EPA does not currently regulate upstream emissions at the source, this is not reason enough to inappropriately attempt to control them via automakers. Clearly automakers have no control over the feedstock's that power plants use to create electricity, nor do we have control over the conversion or transportation processes, or where and when a vehicle owner recharges a vehicle. [EPA-HQ-OAR-2010-0799-9487-A1, pp.76-77]

Further, EPA states, [EPA-HQ-OAR-2010-0799-9487-A1, p.77]

Manufacturers are unlikely [to invest in PHEVs and EVs] if vehicles with these technologies are treated for compliance purposes to be no more advantageous than the best conventional hybrid. [EPA-HQ-OAR-2010-0799-9487-A1, p.77]

EPA Data Supports the Alliance Position [EPA-HQ-OAR-2010-0799-9487-A1, p.77]

The agencies' own analysis and data prove that if upstream carbon emissions from electricity are accounted for in automakers compliance calculations, a PHEV or EV costs three to four times more than a strong hybrid for the same reduction benefit. While the Alliance is not indicating agreement with the agency's analysis and data, we do believe it is helpful to use that analysis and data to show how it supports the Alliance position. [EPA-HQ-OAR-2010-0799-9487-A1, p.77]

Table 3.12-1 of EPA's Draft Regulatory Impact Analysis (EPA RIA) shows several 2011 model year vehicles with associated data. The table includes manufacturer, vehicle name, footprint, unadjusted fuel economy, tailpipe CO_2 and powertrain type. In addition to the data in this table, for select models, below we have also included the associated unadjusted electrical consumption and the cost from other sources within the joint TSD and the EPA RIA. Finally, for the analysis, we included data from a baseline small car (4-cycle, 6-speed at 41 mpg (216.8 g/mile)) from the TSD for comparison purposes. [EPA-HQ-OAR-2010-0799-9487-A1, p.77] [For the table please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.77]

Leaf mpg value is mpge [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

** Costs from EPA documents below: [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

P2 from Table 1.2-7 Costs for P2-Hybird Technology (pg 24 of 377 of the EPA RIA), large car at 10% mass reduction [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

PHEV40 from Table 1.2-9 Costs for Plug-in Hybrid Technology with 40 Mile EV Range, (pg 25 of 377 of the EPA RIA), small car at 15% mass reduction [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

EV75 from Table 1.2-10 Costs for Full Electric Vehicle Technology with 75 Mile Range, or EV75, (pg 25 of 377 of the EPA RIA), small car at 10% mass reduction [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

PSHEV from Table 3-46 Costs for Power-Split Hybrids, small car [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

* 260 w-hr/mi is back-calculated from pg 294 of 893, 'example, as shown in the Regulatory Impact Analysis, today's Nissan Leaf EV would have an upstream GHG emissions value of 161 grams per mile based on national average electricity' [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

* 251.9 Whr/mi is the unadjusted combined electric consumption rate for the Volt as report in certification documentation for the 2011MY Chevrolet Volt [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

From this EPA data, a "grams per unit" benefit (with the 0.0 g/mile incentive in place) can be calculated, compared to the baseline, for each technology. For example, to improve the performance of his fleet, if a manufacturer chose to replace a baseline small car in its fleet with an EV75, it would replace a 216.8 g/mile unit with a 0.0 g/mile and have a 216.8 g/unit benefit. Similarly, if the manufacturer chose to replace the baseline car with a P2HEV, the benefit would only be 46.5 g/unit (216.8-170.3). [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

Further, by dividing EPA's cost by the calculated gram per unit benefit, we can determine the cost per gram of improvement for the manufacturer's potential choices. For example, while replacing a baseline small car with an EV75 gains the manufacturer 216.8 g/unit of benefit, it comes at a cost of $57.7/gram ($12,508/216.8). It is interesting to note, before moving on to these same calculations without the 0.0 g/mile upstream incentive in place, that a PSHEV (i.e., a strong hybrid that does not use grid electricity) is more effective on a $/gram basis than either PHEV40 or an EV75. [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

The next step in the analysis is to determine both the gram/unit and $/gram values for both the PHEV40 and EV75 if the 0.0 g/mile upstream emissions incentive is removed and automakers are required to account for power plant emissions. EPA outlines how this calculation is to occur, proposing a 4-step methodology for calculating the GHG emissions compliance value for vehicle production in excess of the cumulative production cap for an individual automaker.[6] For example, for an EV in MY 2025, this methodology would include the following steps and calculations: [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

Measuring the vehicle electricity consumption in watt-hours/mile over the EPA city and highway tests (for example, a midsize EV in 2025 might have a 2-cycle test electricity consumption of 230 watt-hours/mile). [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

Adjusting this watt-hours/mile value upward to account for electricity losses during electricity transmission (dividing 230 watt-hours/mile by 0.93 to account for grid/transmission losses yields a value of 247 watt-hours/mile). [EPA-HQ-OAR-2010-0799-9487-A1, p.79]

Multiplying the adjusted watt-hours/mile value by a 2025 nationwide average electricity upstream GHG emissions rate of 0.574 grams/watt-hour at the power plant (247 watt-hours/mile multiplied by 0.574 grams GHG/watt-hour yields 142 grams/mile). [EPA-HQ-OAR-2010-0799-9487-A1, p.79]

Subtracting the upstream GHG emissions of a comparable midsize gasoline vehicle of 39 grams/mile to reflect a full net increase in upstream GHG emissions (142 grams/mile for the EV minus 39 grams/mile for the gasoline vehicle yields a net increase and EV compliance value of 103 grams/mile). Using this methodology and the data in table 3.12-1, a g/mile value without the 0.0 g/mile upstream emissions incentive for both the Volt and Leaf can be determined. The Leaf's compliance value without the 0.0 g/mile upstream emissions incentive is 121.5 g/mile while the Volt's is 141.3 g/mile. [EPA-HQ-OAR-2010-0799-9487-A1, p.79] [For the table referenced please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.79]

Applying the same gram/unit and $/gram values for both these values for Leaf and the Volt results in: [EPA-HQ-OAR-2010-0799-9487-A1, p.80]

Model Year Vehicle	Grams/unit benefit NO 0.0	$/gram NO 0.0
2011 Small Car		
2011 Leaf	95.3	131.3
2011 Volt	75.4	155.0 [EPA-HQ-OAR-2010-0799-9487-A1, p.80]

On a dollars per gram of benefit basis, using EPA's own data, an EV75 or PHEV40 costs three to four times as much as a strong hybrid (i.e., $43.1/gram for a strong hybrid versus $131.3/gram for an EV75). Automakers are businesses, and with the 0.0 g/mile upstream electricity emissions incentive, an EV75 or PHEV40 make only marginal business sense. Without the zero upstream emissions factor, both an EV75 and a PHEV40 - all PHEV/EV variants for that matter - make no business sense. The Alliance strongly recommends that EPA finalize the 0.0 g/mile quantification incentive for the purposes of automotive GHG emissions regulations, for all model years, and for all vehicle volumes. [EPA-HQ-OAR-2010-0799-9487-A1, p.80]

Additional Comments Related to Upstream Emissions [EPA-HQ-OAR-2010-0799-9487-A1, p.80]

The Agencies request comment on whether or not the 0.0 g/mile value should phase out completely in MY 2022 or instead decay at half value or some other rate. They also ask for comment regarding the 200,000 unit cap (or 300,000 if certain conditions are met) for MYs 2012-2016. Consistent with our above comments, upstream electricity emissions should be counted at 0.0 g/mile for auto manufacturers for all years - MYs 2012-2025 - with no sales volume limits. [EPA-HQ-OAR-2010-0799-9487-A1, p.80]

The entities with control over those emissions are the federal and state agencies that regulate power plant operation and performance, the power companies that buy and sell power from different energy sources, and the vehicle operators who decide when to recharge their vehicles -- not the manufacturers who produce the vehicles. Assigning upstream emissions factors to grid-powered vehicles would be economically inefficient. The entity to regulate is the utility, not the downstream user. [EPA-HQ-OAR-2010-0799-9487-A1, p.80]

Finally, making vehicle manufacturers responsible for emissions over which they have no control is contrary to the Clean Air Act. Section 202(a) of the Act gives EPA authority to set 'standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines.' Upstream emissions are not emissions 'from' vehicles or engines; they are emissions from power plants and other facilities involved in generating energy used for many purposes, such as powering vehicles. And even if such legal authority existed, with no sound method for assessing comparative upstream emissions effects from grid-powered electric vehicles, and significant regional variations in upstream GHG emissions, the attribution of upstream emissions impacts to grid-powered vehicles alone would be arbitrary, capricious and an abuse of discretion. [EPA-HQ-OAR-2010-0799-9487-A1, p.80]

The Alliance supports the advanced technology volume multipliers as proposed in the NPRM. [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

In addition, the Alliance would support NHTSA’s further evaluation of such multipliers, as their inclusion in the NHTSA requirements would help to further harmonize the two programs. [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

Also, the agencies proposed minimum electric or equivalent all-electric range for the definition of a PHEV for use of this advanced technology volume multiplier. The agencies specify that to qualify, a PHEV must “…be required to be able to complete a full EPA highway test (10.2 miles), without using any conventional fuel, or alternatively, have a minimum equivalent all-electric range of 10.2 miles as measured on the EPA highway cycle.” [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

The Alliance supports this metric and definition. [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

Additional Attribute(s) for PHEV Incentive Multipliers [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

EPA requests comment on whether PHEV incentive multipliers should vary based on range or on another PHEV metric such as battery capacity, or ratio of electric motor power to engine or total vehicle power. [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

Basing PHEV incentive multipliers on factors such as battery capacity or power has potential unintended consequences. These types of metrics encourage manufacturers to install battery capacity or power not demanded by customers thereby increasing vehicle costs. [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

Given the potential unintended consequences of adding additional attributes to determine PHEV incentive multiplier credits, the Alliance recommends that a single multiplier be used for all PHEVs. [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

Dual Fuel Vehicle CAFE Calculations for MY 2020-2025 [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

EPA requests comment on several aspects of dual fuel vehicle CAFE calculations for MY 2020 and later, including how to weight alternative and conventional fuel use and whether to continue use of the petroleum equivalency factor for PHEV equivalent fuel economy and the 0.15 divisor for dual fuel vehicles. [EPA-HQ-OAR-2010-0799-9487-A1, p.82]

EPA proposes to weight dual fuel (but not flexible fuel vehicle) conventional and alternative fuel use by applying the SAE-based utility factor approach. This approach equitably weights the expected fuel use on conventional and alternative fuels based on national driving pattern surveys, and is supported by the Alliance. [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 98.]

Second, the rule needs to fit into comprehensive energy policy. For instance, the proposed rule indicates that the agencies expect electric vehicles to become an increasingly large part of the car market; yet, the rule leaves open the possibility of requiring manufacturers to account for upstream emissions -- this is what Mike Robinson spoke about -- from electricity generation in the event that the Administration is unable to control these emissions through other channels. If programs to address upstream emissions are needed, then let's put them in place with appropriate upstream regulations, not by imposing additional burdens on automakers.

6 - Id. at 75014. The Alliance is using EPA’s methodology only for the sake of analysis. The Alliance is not stating it is in agreement with EPA’s methodology. [EPA-HQ-OAR-2010-0799-9487-A1, p.78]

Organization: American Clean Skies Foundation (ACSF)

In the Proposed Rule, EPA plans to allow a '0 grams per mile' incentive to EVS. This incentive is subject to certain per-manufacturer and industry-wide production caps. The decision to calculate the upstream emissions of EVs at 0 grams per mile (g/mi) is combined with the above multiplier incentive to create undue and discriminatory benefits for EVS. For the reasons stated above, ACSF believes that the 0 g/mi incentive is inappropriate and it should be eliminated. The 0 g/mi is anticompetitive and unnecessarily favors one class of lower carbon vehicle platforms at the expense of others. [EPA-HQ-OAR-2010-0799-9464-A1, p. 11]

Organization: American Council for an Energy-Efficient Economy (ACEEE)

Treatment of EVs and PHEVs

ACEEE has previously expressed to the EPA its view that the treatment of EVs and PHEVs in the GHG emissions program should be based on emissions performance, both to maximize benefits of the rule and to help put plug-in vehicles on a sound environmental footing. Treating EVs as zero-emissions vehicles allows unearned increases in emissions from gasoline vehicles, thereby undercutting the GHG reductions achieved by the rule. We have also previously recommended that, if some EVs are to be treated as zero-emissions vehicles in the 2017-2025 period, the number of such EVs should be capped at 2 million, based on considerations of annual sales volumes and battery cost reductions. The caps on zero-emissions EV proposed in the NPRM far exceed our recommendations. In fact, no cap is proposed for the period 2017-2020. [EPA-HQ-OAR-2010-0799-9528-A2, p.8]

Most important, however, is that a zero-upstream treatment of plug-in vehicles not be continued indefinitely, and that full upstream accounting be applied to these vehicles by a date certain. EPA's proposed treatment of EVs largely accomplishes this, so we strongly support that aspect of the proposal. [EPA-HQ-OAR-2010-0799-9528-A2, p.9]

Recommendations

- In calculating UFs for PHEVs, apply the appropriate shortfall to fuel economy test values in charge-depleting mode. Use Fleet UFs, rather than the MDIUFs, for labeling purposes.
- Make UF values for PHEVs publically available, along with other fuel economy and emissions performance data for individual vehicle models.
- Begin using UFs to calculate the fuel economy of PHEVs in 2017. EPA-HQ-OAR-2010-0799-9528-A2, p.9]

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

Compliance calculations should be transparent and should not include inappropriate incentives or credits. [EPA-HQ-OAR-2010-0799-9485-A1, p.8]

EPA proposed temporary incentives for EVs, PHEVs, and FCVs for MYs 2017-2025 (76 FR 75012). The first is to allow EVs, plug-in hybrid electric vehicles (PHEVs, electric operation), and fuel cell vehicles (FCVs) to use a GHG compliance value of 0 grams per mile, even though upstream GHG emissions for electricity generated by a coal-fired powerplant without carbon capture and sequestration or for hydrogen generation can be very high. The second proposed alternative is a multiplier for all EVs, PHEVs and FCVs which would allow each of these vehicles to “count” as more than one vehicle in the manufacturer’s compliance calculation. AFPM objects to these proposed temporary incentives as they distort real world impacts and paint a false picture of the proposed fuel economy standards. [EPA-HQ-OAR-2010-0799-9485-A1, p.8]

These proposed incentives are inappropriate and very misleading considering the current extent of electricity generation by coal-fired powerplants without carbon capture and sequestration and unknown processes for generating hydrogen. These proposed temporary incentives will not result in a substantial reduction in lifecycle GHG emissions if recharging uses coal-fired powerplants without carbon capture and sequestration. It is certainly not evident that hydrogen will be produced on a low-carbon lifecycle basis. Conversion of fossil fuels like natural gas to produce hydrogen results in carbon emissions until carbon capture and sequestration is commercialized and deployed. [EPA-HQ-OAR-2010-0799-9485-A1, p.8]

Organization: American Honda Motor Co., Inc.

EPA requests comment the multiplier incentives, as proposed in Table III-15, for EVs, PHEVs and FCEVs. Honda supports these multipliers. EVs, PHEVs and FCVs are expensive technologies that hold promising environmental benefits. Honda generally supports incentives that are proportionate to the benefits. Alternative fuel vehicles and advanced technologies face unique challenges in coming to market; developing appropriate infrastructure and overcoming initial consumer resistance to new, unfamiliar technologies. Incentives that are limited in time and appropriately phased-out can help accelerate the introduction of these vehicles. [EPA-HQ-OAR-2010-0799-9489-A1, p. 2]

EPA proposes to set the upstream portion of EVs, PHEVs and FCEVs to zero grams/mile. EPA requests comments on this approach. Honda believes that EPA should separate incentives and credits from the measurement of emissions. Honda believes that without accounting for the upstream emissions of all fuels, inaccurate comparisons between technologies will take place. Relying upon EPA’s regulation, policy makers – in the U.S. and around the world – may make unfavorable technology comparisons and set mis-directed policies as a result. [EPA-HQ-OAR-2010-0799-9489-A1, p. 3]

A compelling example exists. According to DOE’s GREET model, the upstream emissions of a Toyota Prius are 46 grams/mile, and the tailpipe emissions are 198 grams/mile, for a total of 244 grams/mile. By contrast, the GREET model estimates the average upstream emissions of a comparably sized Battery Electric Vehicle (BEV) are 256 grams/mile. Without commenting on the merits of creating incentives for electric vehicles, it is clear that zero grams/mile for the BEV would lead one to believe that BEVs have a clearly superior greenhouse gas profile compared to similarly sized hybrid gasoline vehicles. [EPA-HQ-OAR-2010-0799-9489-A1, p. 3]

EPA's regulations need to be comprehensive and transparent. By zeroing out the upstream emissions, EPA is conflating incentives and credits with proper emissions accounting. In discussions with EPA staff, the question of "double counting" arose. This argument points out that electric power generation is under its own regulations, and including the upstream emissions in this regulation would result in "double counting." Honda observes that upstream emissions are necessarily correlated with the intensity-based emissions regulation of light duty automobiles. In the case of petroleum refineries, significant increases in fuel economy on the part of automobile manufacturers could result in a "windfall" for the refineries' if their tonnage caps were not adjusted accordingly. These two arguments suggest that not only the upstream emissions of electricity but the upstream emissions of all fuels ought to be included in EPA's regulation. [EPA-HQ-OAR-2010-0799-9489-A1, pp. 3-4]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 116-118.]

Honda has long advocated for technology-neutral performance-based standards. These are important principles for several reasons. First, technology-neutral is important because these standards would be in place for more than a dozen years into the future. It is impossible to predict the potential advances that would be made over this time in each and every technology. Technology-neutral standards help to assure that favoritism in 2012 does not lead to failure in 2020. And just as importantly, each OEM will have different capabilities with respect to each technology, and favoritism for a technology necessarily results in, intentionally or not, favoritism for an OEM.

Secondly, performance-based standards are the best way to assure that regulations result in the greatest advance possible for our social goals.

In the 2012 to '16 regulation EPA set the CO_2 value for the electric portion of the plug-in electric vehicles and battery electric vehicles to zero as an incentive for OEMs to bring these relatively expensive vehicles to market. This incentive was capped both in terms of volume and timing. These constraints have been weakened by their extension through 2025. Honda believes that this policy is misguided and creates significant incorrect perceptions about the relative merits of these technologies. We agree with most of the environmental community that the social benefits must be understood and measured on a well-to-wheel basis. It is clear that there are no special virtues to be associated with tailpipe greenhouse gas emissions if the well-to-tank emissions are high.

Additionally, without a comprehensive well-to-wheel assessment of greenhouse gases, EPA and others who rely on EPA's assessments will improperly favor or signal preferred technologies rather than providing technology-neutral standards.

We think the solution to quantify well-to-wheel greenhouse gas emissions is already within the government's grasp. The Department of Energy uses a respected, widely accepted model called GREET, and the NGOs, academics and the federal government itself use GREET to model policy choices when considering light-duty vehicles and their impact on the greenhouse gas emissions. We believe it makes sense for EPA to adopt DOE's GREET model in order to evaluate the well-to-wheel impact on various technologies.

EPA has solicited comments on its proposal for advanced technology multipliers as a means to facilitate market penetration of the most advanced vehicle technologies as rapidly as possible. Honda supports the proposed multipliers for EV, PHEV, and fuel cell technologies. EPA requested comment on the idea of including natural gas vehicles in the technology multipliers. Natural gas vehicles can reduce CO_2 as much as 25 percent simply through changing the fuel from gasoline to natural gas. In addition, there is a new-found abundance of this clean domestic fuel. Together these attributes mean it makes sense to include natural gas vehicles in the advanced technology multiplier.

Organization: American Petroleum Institute (API)

While API has no comment on the stringency of the proposed fuel economy and CO_2 standards, we are concerned that the proposal provides a number of incentives that appear to reflect an attempt to pick winning and losing technologies in the marketplace, an action which could potentially limit consumer choice and increase societal costs. [This comment can also be found in sections 5.1 and 6 of this comment summary.] [EPA-HQ-OAR-2010-0799-9469-A1, p. 1]

Incentives for Electric Vehicles, Plug-in Hybrid Electric Vehicles, and Fuel Cell Vehicles— EPA is proposing an extra credit incentive multiplier for CO_2 compliance purposes to promote early market penetration for all electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCV) sold in MY 2017 through 2021. EVs and FCVs would start with a multiplier value of 2.0 in MY 2017, phasing down to a value of 1.5 in MY 2021. PHEVs would start at a multiplier value of 1.6 in MY 2017 and phase down to a value of 1.3 in MY 2021. The multiplier is 1.0 for MY 2022-2025 vehicles. [EPA-HQ-OAR-2010-0799-9469-A1, p. 1]

For EVs, PHEVs (electricity usage) and FCVs, EPA is proposing to set a tailpipe-only CO_2 compliance value of 0 g/mi. Beginning from MY 2022, the 0 g/mi limit would only be allowed up to a per-company cumulative sales cap, above which manufacturers would be required to account for the net upstream GHG emissions for the electric portion of operation, using accounting methodologies set out in the rule. [EPA-HQ-OAR-2010-0799-9469-A1, p. 1]

As EPA and NHTSA staff should be aware, the history of government agency efforts to dictate the pace of technology development and utilization in the market place is usually unsuccessful, to the detriment of US taxpayers and, ultimately, consumers. The recent bankruptcy filing of the solar panel firm, Solyndra Corp after having received over a half billion dollars in US government loan guarantees is one example.3 Continuation of a mandate to force the use of millions of gallons of cellulosic biofuels (when the current production is zero) is another.4 EPA's faith that NO_x adsorbers will be the predominant technology to meet the heavy-duty diesel engine emissions standards is a third.5 The incentive to use an artificial 0 g/mi lifecycle GHG value for EVs, PHEVs and FCVs and to count this value as much as twice for compliance purposes for a period of time is potentially a fourth example. [EPA-HQ-OAR-2010-0799-9469-A1, p. 2]

API opposed the use of multipliers and 0 g/mi lifecycle GHG scores for advanced technology vehicles in comments filed on the corporate average fuel economy/GHG rulemaking for MY 2012 – MY 2016 passenger cars and light trucks, and our opposition remains unchanged.7 Ignoring the significant contribution of (and extensive compilation of published literature on) upstream CO_2 emissions from electricity generation, defies principles of transparency and sound science and distorts the market for developing transportation fuel alternatives. It incentivizes the electrification of the vehicle fleet with a pre-defined specific and costly8 set of technologies whose future potential is not measured with the same well-to-wheels methodology against that of advanced biofuels or other carbon mitigation strategies. Furthermore, when used in conjunction with the car/light truck trading flexibilities proposed for the automakers, this incentive could potentially yield unintended consequences that run counter to the intent of the rule to reduce GHG emissions attributable to light-duty vehicles. [EPA-HQ-OAR-2010-0799-9469-A1, pp. 2-3]

Although battery electric vehicles (BEVs) and hydrogen fuel cell vehicles (HFCVs) have zero tailpipe emissions, they will have significant upstream emissions. Despite the proposed per-company cumulative production cap on the numbers of BEVs and HFCVs that will qualify for the zero emissions compliance incentive, the effect of ignoring upstream GHG emissions yields a substantial incentive for these qualifying vehicles as we demonstrate below. [EPA-HQ-OAR-2010-0799-9469-A1, p. 3]

Upstream emissions, coupled with the incentive multipliers described above, will allow well-to-wheels (WTW) carbon dioxide equivalent (CO_2e) emission rates for BEVs and HFCVs that are clearly greater than the gasoline vehicles they would replace for model years 2017 to 2021, even though they are counted as zero for compliance purposes. Even for model years 2022 to 2025, neither BEVs nor HFCVs have a WTW emission rate markedly lower than the gasoline target. These results, which are based on the published fuel economy performance and specifications (i.e., footprint) of the Nissan Leaf (BEV) and Honda FCX Clarity (HFCV), are shown in Figures 1 and 2, respectively. Appendix A summarizes the details regarding the calculation of the estimated WTW CO_2e gram-per-mile emission rates shown in these figures, which reflect U.S. average electricity emission rates and hydrogen produced from natural gas via steam methane reforming. [Figures 1 and 2 can be found on p. 4 of Docket number EPA-HQ-OAR-2010-0799-9469-A1.] [Appendix A can be found on pp. 14-18 of Docket number EPA-HQ-OAR-2010-0799-9469-A1] [EPA-HQ-OAR-2010-0799-9469-A1, p. 3]

Regulatory agencies should not be in the business of promoting investments and innovations in government-selected technologies applied to government-selected vehicle categories. Regulators should instead set broad, performance-based targets that reward innovation directed at achieving outcomes, not the implementation of specific technologies. The market, via consumer choice, should then be allowed to select the winners and losers. In short, the proposed 0 g/mi CO_2 compliance values and multipliers for EVs, PHEVs and FCVs should be removed. [EPA-HQ-OAR-2010-0799-9469-A1, p. 3]

Calculation of Upstream GHG Emissions

EPA argues that electricity and hydrogen can be produced from renewable resources with very low carbon emissions (e.g., wind energy for electricity and use of that electricity for electrolysis of water to H2). The contribution of these carbon-free electricity feedstocks (to the extent that they are dedicated to the production of transportation fuels in the timeframe of the proposed rule) should be calculated as a percent of their overall contribution to the electricity grid. [EPA-HQ-OAR-2010-0799-9469-A1, p. 5]

EPA is requesting comment on the appropriate electricity upstream GHG emissions factor or rate to use in future projections of EV/PHEV emissions based on the net upstream approach outlined in the proposed rule. The Agency is proposing to use a CY 2025 nationwide average electricity GHG emissions rate (power plant plus feedstock extraction, transportation, and processing) of 0.574 grams GHG/watt-hour, based on simulations with the EPA Office of Atmospheric Program's Integrated Planning Model (IPM) in the calculation of upstream GHG emissions for EVs and PHEVs. API concurs with the EPA's observation that there is significant regional as well as temporal variation in the fuels and equipment used for electric power generation. Consequently, a more robust analysis and representation of upstream electricity GHG emissions that incorporates this regional and temporal variability is preferable if the ultimate objective is to reflect real-world fuel usage patterns. [EPA-HQ-OAR-2010-0799-9469-A1, p. 5]

EPA notes that the emission factor for electricity was adjusted upwards by 6 percent in order to properly capture GHG emissions associated with the feedstock gathering that occurs upstream of the power plant. This adjustment apparently was based on the GREET Model Version 1.8.c.0 and was carried over from the analysis used to support the MY 2012-MY 2016 Final Rule.10 Using the most recent version of GREET (version 1_2011) yields an adjustment factor of 9.2% for the average US electricity mix in calendar year 2020, calculated as shown in Appendix B of these comments. However, this revised adjustment factor from GREET masks a wide range of uncertainty in the underlying data used in the model – a fact recently acknowledged in print.11 If EPA continues to rely on GREET for upstream emissions calculations, this further heightens the need for the Agency to conduct a more robust and rigorous analysis (as discussed above) to increase confidence in the accuracy of the model results. [Appendix B can be found on p. 19 of Docket number EPA-HQ-OAR-2010-0799-9469-A1.] [EPA-HQ-OAR-2010-0799-9469-A1, pp. 5-6]

• The government should not pick technology winners - Regulatory agencies should not promote investments and innovations in government-selected technologies applied to government-selected vehicle categories. Regulators should instead set broad, performance-based targets that reward innovation directed at achieving outcomes, not the implementation of specific technologies. The market, via consumer choice, should then be allowed to select the winners and losers. The proposed production and compliance incentives - particularly those for plug-in hybrid electric vehicles (PHEVs) full electric vehicles (EVs) fuel cell vehicles (FCVs) and dual-fueled vehicles should be removed. [EPA-HQ-OAR-2010-0799-9469-A2, pp. 1-2]

• The proposal distorts the market and ignores real environmental impacts - Allowing plug-in hybrid electric vehicles, full electric vehicles and fuel cell vehicles to certify to a 0 g/mi CO_2 standard does not properly reflect the full well-to-wheels contribution of these technologies to the GHG inventory. By not counting the real contribution of upstream CO_2 emissions from electricity generation, the proposal distorts the market for developing transportation fuel alternatives. The 0 g/mi CO_2 compliance values for EVs, PHEVs and FCVs should be dropped from the proposal. [EPA-HQ-OAR-2010-0799-9469-A2, p. 2]

3 Bloomberg Business Week, Solyndra Files for Bankruptcy, Looks for Buyer, September 6, 2011, http://www.businessweek.com/ap/financialnews/D9PJ89JG0.htm [EPA-HQ-OAR-2010-0799-9469-A1, p. 2]

4 US Environmental Protection Agency, EPA Finalizes 2012 Renewable Fuel Standards, December 2011, http://www.epa.gov/otaq/fuels/renewablefuels/documents/420f11044.pdf [EPA-HQ-OAR-2010-0799-9469-A1, p. 2]

5 http://www.epa.gov/otaq/highway-diesel/regs/ria-iii.pdf [EPA-HQ-OAR-2010-0799-9469-A1, p. 2]

7 Isakower, K.B., American Petroleum Institute, November 24, 2009, Comments on the Proposed Rulemaking to Establish Light Duty Vehicle Green House Gas Emission Standards and Corporate Average Fuel Economy Standards, submitted to Dockets EPA-HQ-OAR-2009-0472 and NHTSA-2009-0059 [EPA-HQ-OAR-2010-0799-9469-A1, p. 2]

8 For instance, Table V-107 of the NHTSA Preliminary Regulatory Impact Assessment suggests that the net accumulated cost of a Mid-Size Passenger Car EV (75 mile range) in MY 2025 is anticipated to be $13,517 - exclusive of the incremental costs associated with expanding the EV charging infrastructure. [EPA-HQ-OAR-2010-0799-9469-A1, p. 3]

10 EPA, NHTSA, Draft Joint Technical Support Document: Proposed Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards, November 2011, p. 4-43 [EPA-HQ-OAR-2010-0799-9469-A1, p. 5]

11 Burnham, A. et al, Argonne National Laboratory, “Life-Cycle Greenhouse Gas Emissions of Shale Gas, Natural Gas, Coal and Petroleum,” Environmental Science & Technology, 2012, 46,619-627 [EPA-HQ-OAR-2010-0799-9469-A1, p. 5]

Organization: Association of Global Automakers, Inc. (Global Automakers)

EPA has proposed company specific caps on the 0 grams per mile emissions rate for electric and fuel cell vehicles beginning with MY 2022. Global Automakers recommends that EPA reconsider the need for these caps as part of the planned mid-term review of the standards. If EPA decides to adopt company-specific caps, we recommend that it adopt a simple linear function based on vehicle sales levels to establish the caps, rather than using the proposed two-step approach. [EPA-HQ-OAR-2010-0799-9466-A1, p. 7]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 66-67.]

Advanced technology credit provides an incentive for manufacturers to continue to develop and market these technologies which have the potential for substantial long-term improvements in fuel efficiency and emission performance.

Organization: BMW of North America, LLC

Regarding electric vehicles, automakers can influence tailpipe emissions but not power plant emissions. [EPA-HQ-OAR-2010-0799-9579-A1, p. 1]

We acknowledge that the upstream impact of electricity generation needs to be addressed in order to ensure the credibility of a policy supporting the electrification of road transport; therefore, 0g/mi upstream emissions can be the goal. However, as automakers, we accept the responsibility for vehicle efficiency, but we have no control over the carbon content of electricity generation and cannot be held responsible for energy mix decisions made decades ago. Automakers can influence tailpipe emissions but not power plant emissions. [EPA-HQ-OAR-2010-0799-9579-A1, p. 3]

Multipliers encourage automakers to pull-ahead early generation low CO_2 technologies such as BEV, PHEV and FCV. Multipliers should be applied on advanced technologies with significant GHG reduction potential (which are much more expensive than mature gasoline technologies). Therefore, they are a motivation for automakers to move forward with cost-intensive technology (low volume, high investments) to reach full market economic viability. Multipliers are a key issue because significant market penetration of electric vehicles is needed for compliance with the proposed standards. The mid-term evaluation should also reassess the further need of multipliers, based on the current market penetration of electric vehicles. BMW is supportive of the proposed multipliers and recommends the inclusion of BEVx with a pro-rated multiplier in line with the recent CARB proposal. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 3]

Projections by US authorities for overall standard achievement and projections for each OEM are all based on the assumption of a 0g/mi upstream approach. It is fundamentally unfair to punish the auto industry for power plant decisions made decades ago. Further, public utility commissions do not consider electric vehicles when they make decisions. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 4]

The proposed cap for MYs 2022-25 may serve to slow the U.S. market penetration of electric vehicles as described below:

• Situation 1: A significant market penetration of E-mobility is needed for compliance with the proposed standards through MY2025 (i.e., industry must undertake extensive efforts). If E-mobility does not develop as expected today or as projected in the joint draft Technical Support Document (TSD), automakers will need to compensate the missing E-mobility contribution through the introduction/penetration of additional cost-intensive advanced technologies, thereby creating a disadvantage for automakers. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 4]

• Situation 2: If E-Mobility shows a higher success than assumed, then industry will be punished for their efforts by inclusion of upstream emissions but without a corresponding correction of the standards. This increases the stringency of the standards, again disadvantaging automakers. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 4]

• Result: The inclusion of upstream emissions, even with the proposed exemption for MYs 2022-25, creates a strong disincentive for future E-mobility activities from automakers. Automakers do not control the electric power grid mix and have absolutely no ability to influence upstream emissions. Therefore, 0g/mi upstream emissions should be set for electric vehicles without caps or other conditions for the duration of the rule and beyond. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 4]

However, if the proposed cap for MYs 2022-25 is retained, BMW recommends the adoption of the following for the treatment of upstream emissions when the cap is exceeded:

• Manufacturers are responsible for vehicle energy consumption only.

• Therefore, the regulation of energy efficiency should be taken into account by converting the electric energy consumed during the cycle into fuel efficiency- or CO_2- equivalent by means of a MJ based conversion from electricity to gasoline CO_2 content. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 5]

Organization: Borg Warner, Inc.

In reviewing the proposal we are concerned that the rules contain a lot of language and incentives to steer the technologies used to achieve the goals. We feel the rules should focus solely on setting the standards and let the marketplace decide which technologies are best to meet the consumer needs. [EPA-HQ-OAR-2010-0799-9320-A1, p. 1]

The inclusion of performance based credits offered for any vehicle that achieves a rating above the standard is the right approach and we commend the EPA and NHTSA for this. However, we see no need to also offer credits based on simply using a certain technology regardless of its credits for incorporating a technology regardless of the contribution that technology has made in improving CO_2 performance, and plug-in electric, plug-in hybrid electric and fuel cell vehicles that are rated at 0 g/mi CO_2 and also receive an inflationary multiplier to vehicle volumes when calculating corporate averages. In today's atmosphere of limited capital this approach to drive a certain technology mix could also impede the development and market introduction of more conventional, cost-effective solutions that utilize existing infrastructure in large volumes resulting in better real-world results. All technologies need to be on equal ground and evaluated/incentivized based on their real-world performance. [EPA-HQ-OAR-2010-0799-9320-A1, pp. 1-2]

Organization: Center for Biological Diversity

1. The electric vehicle credits must be removed

The Center supports the development of all forms of non-fossil-fuel based vehicles, including electric vehicles (EVs), battery electric vehicles (BEVs), fuel cell electric vehicles (FCEVs) and plug-in hybrid electric vehicles (PHEVs). Although these vehicles are likely to have tremendous advantages in the form of energy conservation and greenhouse gas emissions reductions over conventional vehicles and play a critical role in weaning the transportation sector off fossil fuel use, those benefits can be lost if manufacturers are given credits for them that exceed the actual improvements they bring. In addition, credits lead to lower fuel efficiency standards overall if used to evade other efficiency technologies that would otherwise be installed. [EPA-HQ-OAR-2010-0799-9479-A1, p. 21]

For this reason, it is imperative that the Agencies complete full life-cycle analyses of the greenhouse gas emissions of each of these vehicles, accurately account for them in the overall vehicle fleet, and limit credits for these vehicles based only on actual emission reductions they achieve. We also believe the two “bonus credits” the NPRM envisions for EVs are inappropriate.100 These credits are (1) a default greenhouse gas compliance value of zero g/mi for BEVs, FCEVs and PHEVs, and (2) a multiplier system that lets manufactures count each EV as more than one vehicle in the earlier years of the rulemaking. [EPA-HQ-OAR-2010-0799-9479-A1, p. 21]

While we believe that credits may have provided a valuable incentive for electric vehicles during the 2012-2016 rulemaking to encourage this relatively new technology, such concerns are now misplaced. The 2017-2025 rulemaking years no longer constitute a start-up period for these vehicles. Allowing their lifecycle greenhouse gases to be ignored may well lead to substantial unintended consequences, encouraging forms of technologies that actual do not reduce greenhouse gases to the extent envisioned. Only full, transparent, and accurate accounting can guard against this clear possibility, including full modeling of regional variations in grid electricity carbon intensity. As pointed out by ICCT, the use of multipliers and windfall credits for vehicles required under the California ZEV mandate is particularly problematic and should be eliminated, and we incorporate ICCT’s comment on this subject here by reference. 101 ICCT calculates that these two forms of credit would eliminate the reduction of 80 to 110 million metric tons of greenhouse gases from the MY 2017-2025 rulemaking period.102 This is clearly contrary to the statutes’ intent, and we urge the Agencies to remove these credits from the final rulemaking. [EPA-HQ-OAR-2010-0799-9479-A1, p. 21]

100 We agree with the Agencies’ assessment that the credits for electric vehicles already included in 49 U.S.C. § 32904(a)(2)(B) precludes additional incentives beyond those already provided for by Congress. NPRM, 76 Fed. Reg. 74878 n.56. [EPA-HQ-OAR-2010-0799-9479-A1, p. 21]

101 ICCT Comments at 29-34. [EPA-HQ-OAR-2010-0799-9479-A1, p. 21]

102 Id. [EPA-HQ-OAR-2010-0799-9479-A1, p. 21]

Organization: Center for Sustainable Systems, University of Michigan

We recognize that electrified vehicles, including battery electrics (EVs), and plug-in hybrids (PHEVs), have the potential to reduce GHG emissions from the light-duty vehicle fleet. In low carbon grid scenarios electrified vehicles have been shown to have a lower emissions profile than conventional gasoline and diesel powered vehicles (CVs).[1] However, the GHG emissions attributable to electrified vehicles charged on the current U.S. electric grid, are significant.[2] The proposed 2017-2025 GHG emission standards neglect to count these important upstream sources. This may result in unintended consequence by incentivizing electrified vehicles which may be charged in regional grids of high carbon intensity. Vehicles charged in these grids may do little to reduce the total new vehicle fleet GHG emissions, without a significant change in the electric grid. [EPA-HQ-OAR-2010-0799-9493-A1, p.1]

1 - Elgowainy, A., et al. (2010). “Well-to-wheels analysis of energy use and greenhouse gas emissions of plug-in hybrid electric vehicles.” Chicago, IL, Argonne National Laboratory.

2 - MacPherson, N. D., Keoleian, G. A., Kelly, J. C. (2012). ”Fuel Economy and Greenhouse Gas Emissions Labeling for Plug in Hybrid Vehicles from a Life Cycle Perspective.” Journal of Industrial Ecology. In review.

Organization: Ecology Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 190-191.]

in particular the incentives for electric vehicles, plug-in electrics and fuel cell vehicles.

As I stated earlier, support for these emerging technologies is critical if we are to maintain U.S. leadership and encourage new manufacturing opportunities here at home. We do agree, however, that the incentives should be phased out over time so the full emissions of these vehicles can be accounted for. We, therefore, support the decrease in the incentive multiplier and the proposed manufacturer caps on the 0-gram per mile value for upstream emissions.

Organization: EcoMotors International, Inc.

II. Proposed Incentives for EVs, PHEVs, and FCVs

In developing the proposed standards, the agencies have considered and accounted for a wide range of technologies which they believe are, or will be available for manufacturers to reduce GHG emissions and improve fuel economy. These technologies specifically include advances in gasoline engines and transmissions - technology already familiar to, and accepted by the vast majority of consumers. However, in the Proposed Rule the agencies have chosen to limit valuable industry incentives for meeting these standards to a small, select group of vehicles. [EPA-HQ-OAR-2010-0799-9594-A2, p. 3]

While we agree that including credit mechanisms in the National Program is necessary and appropriate, such provisions should not undercut the primary objectives of the program, namely achieving significant reductions of GHG emissions and improving fuel economy in the light vehicle fleet. Favoring a handful of vehicle technologies over other competing technologies with equal or better performance is counter to the intent of the Proposed Rule. EcoMotors urges EPA and NHTSA to adopt a significantly more technology-neutral and attribute-based program that provides greater opportunities and incentives for OEMs to take advantage of a broader range of technologies to meet federal standards. [EPA-HQ-OAR-2010-0799-9594-A2, p. 4]

A. EPA's Proposed Multiplier Incentive for EVs, FCVs and PHEVs

In order to encourage commercialization of EVs, FCVs and PHEVs, EPA is proposing an incentive multiplier for all EVs, PHEVs, and FCVs sold in MYs 2017-2021. Each EV/PHEV/FCV would 'count' as more than one vehicle in a manufacturer's compliance calculation. EPA is also considering providing similar multiplier incentives to dedicated and/or dual fuel compressed natural gas vehicles. [EPA-HQ-OAR-2010-0799-9594-A2, p. 4]

EcoMotors endorses EPA's institution of temporary regulatory incentives that will promote commercialization of game-changing advanced vehicle technologies. However, as drafted, the regulations would result in OEMs and consumers being force-fed a select group of costly vehicles at the expense of technology neutrality. Other less-costly and equally energy efficient and environmentally beneficial vehicle technologies - available today - should be afforded equally beneficial regulatory incentives. [EPA-HQ-OAR-2010-0799-9594-A2, p. 4]

EPA has been very candid about the significant consumer barriers facing EVs, FCVs and PHEVs in the Proposed Rule. While it 'remains optimistic' about consumer acceptance of these vehicles in the long run, it acknowledges that it is 'less certain' about their near-term market acceptance. The unease expressed by the agency is not unfounded. A 2010 study by J.D. Power and Associates concluded that the significant obstacles faced by hybrid electric vehicles and battery electric vehicles make it unlikely that global demand for these vehicles will reach the levels predicted for the industry. The study determined that sales of these advanced vehicles are expected to account for only slightly more than 2.2% of global passenger-vehicle sales in 2010, and will only account for 7.3% of global passenger-vehicle sales in 2020.6 [EPA-HQ-OAR-2010-0799-9594-A2, p. 4]

The Proposed Rule, if implemented, will clearly diminish the incentive for automotive manufacturers to invest in a range of other technologies that can dramatically reduce GHG emissions and improve fuel economy. Yet, as the Boston Consulting Group recently noted, '[a]dvanced ICE technologies [which include gasoline- or diesel-based direct injection, reduction of engine displacement by turbocharging and reduction of internal engine resistance] will be the most cost-effective way to reduce CO_2 emissions on a broad scale.' 7 Near-term development and commercialization of advanced ICE technologies, such as the opoc engine and other advanced vehicle technologies, remains an extremely important path for emissions reduction and fuel economy improvements and should be encouraged by national policy, particularly considering the challenges that must still be overcome for widespread market acceptance of EVs, FCVs and PHEVs. [EPA-HQ-OAR-2010-0799-9594-A2, p. 5]

Other hybrids, such as hydraulic hybrids, should also be targeted for regulatory incentives. Certainly EPA's partnership with the Chrysler Group, LLC to apply EPA's hydraulic hybrid technology to LDVs is a clear indication that EPA is very optimistic about the GHG and fuel economy benefits of this cutting-edge technology. The Final Rule should include language broad enough to encompass, and grant incentives to hydraulic hybrid vehicles, as well as all mechanical hybrids. [EPA-HQ-OAR-2010-0799-9594-A2, p. 6]

- Specific Recommendation: EcoMotors strongly encourages EPA to extend comparable EV/PHEV/FCV multiplier incentives to OEMs that manufacture mechanical hybrid vehicles, hydraulic hybrid vehicles, and similar advanced technology hybrid vehicles during MYs 20172021. This would place other significant, game-changing vehicle technologies -like the dual-module opoc engine - on a level playing field with EVs, PHEVs and FCVs, and continue to encourage innovation in our struggling auto industry. EcoMotors stands ready to assist the agencies in crafting appropriate language to embrace a range of advanced technology hybrid vehicles. [EPA-HQ-OAR-2010-0799-9594-A2, p. 7]

EPA is proposing a 0g/mile tailpipe compliance value for all EVs, PHEVs (electricity usage) and FCVs in MYs 2017-2021. In MYs 2022-2025, 0g/mi would only be allowed up to a per-company cumulative sales cap, established on a tiered basis. EPA proposes to phase-in the change in compliance value, from 0g/mile to a net upstream accounting, for any manufacturer that exceeds its cumulative production cap for EV/PHEV/FCVs. Not until MY 2022 would the compliance value for EVs, FCVs, and the electric portion of PHEVs in excess of individual automaker cumulative production caps begin to be calculated according to a methodology that accounts for the full net increase in upstream GHG emissions relative to that of a comparable gasoline vehicle. [EPA-HQ-OAR-2010-0799-9594-A2, p. 9]

The EPA proposal to specify 0g/mile for these vehicles' tailpipe emissions continues to completely ignore the fact that electric vehicles draw some or all of their fuel from the grid which is not GHG free.13 Yet EPA has repeatedly acknowledged that 'the upstream GHG emissions associated with production and distribution of electricity are higher than the corresponding upstream GHG emissions of gasoline or other petroleum based fuels.” The Proposed Rule even notes that 'today's Nissan Leaf EV would have an upstream GHG emissions value of 161 grams per mile based on national average electricity, and a value of 89 grams per mile based on the average electricity in California, one of the initial markets for the Leaf.' Other significant studies, such as the National Academy of Sciences' report, 'Hidden Costs of Energy-Unpriced Consequences of Energy Production and Use,' have also recently drawn attention to the hidden life-cycle costs associated with electric vehicles - including those associated with energy- and material-intensive battery and electric motor production. [EPA-HQ-OAR-2010-0799-9594-A2, p. 9]

An accurate assessment of the environmental benefits of fuel/propulsion system options requires a complete 'well-to-wheels' analysis. The CO_2 value for these vehicles should be based on a sound scientific approach. [EPA-HQ-OAR-2010-0799-9594-A2, p. 10]

The impacts on GHGs and other pollutant emissions from electric vehicles are significant and should be quantified by EPA to the extent possible for purposes of this rulemaking. The emissions associated with EVs, PHEVs and FCVs should not be ignored for several more years. Commencing with MY 2017, EPA should set aside all incentives that falsely suggest that there are no environmental repercussions associated with the use of these vehicles. Furthermore, when combined with the incentive multipliers proposed for EVs, PHEVs and FCVs (discussed above), allocating a 0g/mile emissions value to these vehicles is clearly excessive. EPA is promoting these vehicles well beyond their environmental merits. This is inherently inequitable to other less-costly and even more environmentally-beneficial vehicle technologies available today -like EcoMotors' opoc MDH engine. [EPA-HQ-OAR-2010-0799-9594-A2, p. 11]

- Specific Recommendation: EcoMotors encourages EPA to drop the 0g/mile tailpipe compliance value for EVs, PHEVs (electricity usage) and FCVs and to calculate and include the full 'well-to-wheels' upstream emissions from fuel production and distribution in their CO_2 emissions commencing in MY2017 in order to achieve equity across different vehicle technologies. [EPA-HQ-OAR-2010-0799-9594-A2, p. 11]

---

6 J.D. Power and Associates, 'Drive Green 2020: More Hope than Reality?' (November 2010). The MIT Electric Vehicle Team has identified significant limitations for electric vehicles in each of the following areas: energy and power density, battery charging, lifetime performance, and system costs, and recently cautioned: Existing internal combustion powertrains are remarkable in that they provide excellent performance... We can drive our cars for more than 300 miles, fill lip anywhere in 5 minutes. When treated well, these vehicles can last a decade and travel hundreds of thousands of miles before they finally fall apart. This sets quite a high bar for the new EV market entrants. MIT Electric Vehicle Team, 'Technology, Challenges, and the Future of Electric Drive,' (April 2008), p. 1, http://web.mit.edu/evt/summary future. pdf.

7 The Boston Consulting Group, 'The Comeback of the Electric Car? How Real, How Soon, and What Must Happen Next' (2009), p. 2. See also J.D. Power and Associates, supro, p. 68 ('[I)n order to safeguard the environment today, it will remain important to pursue continuous improvements in ICEs and allow time to map out the future.')

13 EcoMotors commends the agency for attempting to fully account for the upstream GHG emissions associated with all electricity used by EVs and PHEVs (and any hydrogen used by FCVs) in its regulatory projections of the impacts and benefits of the program, and in all GHG emissions inventory accounting.

Organization: Edison Electric Institute (EEI)

More than most other technologies or policy options, EVs offer the U.S. the capability to substantially reduce, if not end, its dependence on petroleum fuels. EEI’s comments focus on EPA’s regulatory incentives to foster widespread commercial deployment of EVs. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 1-2]

I. Executive Summary

Electric vehicles "have significant transportation GHG emissions and oil consumption gamechanging potential in the long-run." Increased deployment of EVs will increase fuel efficiency and reduce dependence on petroleum. Increased EV deployment also will reduce emissions of GHGs and criteria air pollutants from the transportation sector. These environmental benefits will be compounded by the continued reductions in emissions of both GHGs and criteria air pollutants related to the generation of the electricity that will fuel EVs. [EPA-HQ-OAR-2010-0799-9584-A2, p. 2]

EEI supports the decision to use 0.0 g/mile for the EV (and PHEV in all-electric mode) compliance value for MY 2017-2021 and to provide a multiplier for manufacturers who produce these zero-emitting vehicles. EPA should not "discount" EV incentives for MY 2022-2025 to reflect specific upstream GHG emissions related to electricity production. If EPA decides to discount EV incentives in the later years of the proposal, the Agency should not calculate an upstream electricity GHG emissions factor today for standards that will not take effect for nearly 10 years. Given the limits of EPA's modeling and uncertainties about the fuel and emissions profile of electric generation in 10 years, there is no way that any emissions factor for MY 2022 calculated today would bear a reasonable relationship to actual future emissions. [EPA-HQ-OAR-2010-0799-9584-A2, p. 2]

Moreover, EPA's proposed approach to assessing upstream GHG emissions in the power sector is inappropriate, unfair and based on incorrect data and assumptions. By focusing only on upstream electricity GHG emissions and not upstream emissions related to other fuels, EPA is not fairly comparing the overall well-to-wheels emissions of EVs with those of conventional vehicles. When compared on a well-to-wheels basis, EVs have lower emissions than conventional vehicles. If EPA continues to focus on upstream electricity GHG emissions, the Agency's analysis must be based on the most accurate and timely information about the makeup of the electric generating fleet and must consider regional variation in generation portfolios, particularly in those areas that are likely to be earlier adopters of this important technology. If EPA does not revise this approach, the Agency will continue to overestimate EV emissions as compared to emissions from conventional fuels, underestimating the environmental, economic and energy security benefits of EVs are realized. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 2-3]

II. EPA and NHTSA Should Incentivize the Production of All Types of Electric Vehicles for All Model Years Covered by the Proposed Rule.

EEI applauds EPA's determination that incentives are needed to ensure the commercial success of electric vehicles because they "have significant transportation GHG emissions and oil consumption game-changing potential in the long-run." 75 Fed. Reg. at 75011. Increased deployment of EVs will increase fuel efficiency and reduce dependence on petroleum, consistent with the goals of the Energy Independence and Security Act of 2007. Increased EV deployment also will reduce emissions of GHGs and criteria air pollutants from the transportation sector. These environmental benefits will be compounded by the continued reductions in upstream emissions of both GHGs and criteria air pollutants related to the generation of the electricity that will fuel EVs. See upstream emissions discussion in section III, infra. [EPA-HQ-OAR-2010-0799-9584-A2, p. 3]

At present, as EPA notes in the proposed rule, the missing link between the potential environmental and energy independence benefits of EVs and achieving these benefits is the widespread deployment of this new technology. See 76 Fed. Reg. at 75011. EPA's proposed incentives for EVs will help forge this link. EEI supports providing EV incentives in the context of CAFE and GHG vehicle standards, as discussed below. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 3-4]

A. EPA Should Finalize the EV Incentives for MY 2017-2021 as Proposed.

EPA proposes different incentives for the different types of electric vehicles and for different time periods covered by the MY 2017-2025 standards. For MY 2017-2021, EPA proposes two incentives: 1) allowing EVs, including PHEVs in all-electric mode, to use emissions of 0.0 g/mile for compliance purposes; and 2) providing a multiplier that allows EVs to "count" as more than one vehicle in a manufacturer's compliance calculation. The proposed multiplier for PHEVs is discounted, presumably to reflect operations not in all-electric mode. 76 Fed. Reg. at 75012. [EPA-HQ-OAR-2010-0799-9584-A2, p. 4]

EPA considers counting EV emissions (and PHEV emissions when operating all-electric mode) as 0.0 g/mile an "incentive" because of concerns related to the upstream GHG emissions associated with electricity production. See upstream emissions discussion, section III, infra. While EEI appreciates EPA's efforts to foster increased EV manufacturing and deployment, it must be emphasized that this is not an "incentive" but a recognition of actual EV emissions, which are 0.0 g/mile when measured at the tailpipe, the proper point at which to measure compliance with vehicle emissions standards. [EPA-HQ-OAR-2010-0799-9584-A2, p. 4]

Nonetheless, these MY 2017-2021 incentives represent a welcome improvement and departure from EPA's more limited approach to EV incentives for MY 2012-2016, which placed a production cap on the number of vehicles for which manufacturers could use 0.0 g/mile for compliance purposes and provided no multipliers. See 75 Fed. Reg. 25324 (May 7, 2010). EEI supports the broader "incentives" for MY 2017-2021 proposed by EPA as tools necessary to encourage the increased manufacture and ultimate deployment of EVs and PHEVs. EPA should finalize these incentives as proposed. [EPA-HQ-OAR-2010-0799-9584-A2, p. 5]

B. EPA's Approach to Incentives for MYs 2022-2025 Is Fundamentally and Technically Flawed and EPA Should Wait to Finalize These Incentives.

For MY 2022-2025, EPA proposes only one "incentive" for EVs: Manufacturers can use 0.0 g/mile for EVs (and PHEVs in all-electric mode) when calculating compliance averages, but this is limited by a manufacturer-specific production cap. The production cap is tiered to provide greater incentives to those manufacturers that invest in EV technologies earlier. See 76 Fed. Reg. at 75013. EPA states that the production cap also is necessary as a way to limit "the overall decrease in program GHG emissions reductions associated with the incentives." Id. [EPA-HQ-OAR-2010-0799-9584-A2, p. 5]

In the alternative, EPA is considering an industry-wide production cap to provide greater certainty as to the number of EVs deployed and the overall impact on GHG emissions. See id. EPA suggests that a 2-million vehicle cap would limit the "maximum decrease in GHG emissions reduction to about 5 percent of total program GHG savings." Id. EPA would allocate the cap to individual automakers in calendar 2022 based on cumulative EV/PHEV/FCV sales in MYs 2019-2021. Id. [EPA-HQ-OAR-2010-0799-9584-A2, p. 5]

For vehicle production that exceeds the cap, EPA proposes that compliance values for EVs and PHEVs be "calculated according to a methodology that accounts for the full net increase in upstream emissions relative to that of a comparable gasoline vehicle." Id. EPA proposes a methodology for making this calculation, based on estimated future projections of upstream GHG emissions associated with the grid electricity used to charge EVs and PHEVs. See id. at 75014. [EPA-HQ-OAR-2010-0799-9584-A2, p. 6]

In order to discount the incentive for any sales above the manufacturer-specific (or industrywide) cap for MY 2022-2025, EPA proposes a four-step methodology, which would require, among other things, measuring EV electricity consumption in Watt-hours/mile and then multiplying this figure by an already pre-determined 2025 nationwide estimated average electricity upstream GHG emissions rate of 0.574 grams/Watt-hour. See 76 Fed. Reg. 75014. EPA would use a similar approach for PHEVs. See id. [EPA-HQ-OAR-2010-0799-9584-A2, p. 6]

EEI opposes the use of any upstream GHG emissions factor. EV tailpipe emissions are 0.0 g/mile, and this is the value that should be used for compliance purposes for all time periods covered by the proposed vehicle standards. EPA should not "discount" this compliance value to reflect upstream GHG emissions related to electricity production. After all, EPA does not calculate any value for upstream emissions rates for conventionally-fueled vehicles.3 [EPA-HQ-OAR-2010-0799-9584-A2, p. 6]

In addition to EEI's general objection to estimating any discount factor based on upstream electricity GHG emissions, there are several issues with EPA's proposed approach to estimating an appropriate discount factor. If EPA persists in using a discount factor, the Agency must address these issues. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 6-7]

First, it is inappropriate for EPA, now in 2012, to calculate any upstream electricity GHG emissions rate for 2025, as there is no way that this value could reasonably approximate actual electric generating unit (EGU) emissions 13 years in the future. The current version of EPA's Integrated Planning Model (IPM), which is used to generate electricity generation emissions data, relies on certain assumptions about the current national electric generating unit (EGU) fleet and incorporates some, but not all, regulations affecting EGUs in the near term. The version of IPM used for the proposed vehicle standards does not, for example, include EPA's recently promulgated hazardous air pollutant regulations, nor does it include any regulations that are not currently on the books, but expected to be final and effective well before MY 2025. These include GHG new source performance standards (NSPS) for both new and existing EGUs, new effluent guidelines for EGUs, new regulations for EGU cooling water intake structures and new regulations affecting the disposal of coal combustion residuals. These regulations will dramatically change the makeup of the current EGU fleet, as many coal-based units will retire rather than incur the substantial costs associated with air, water and solid waste pollution control retrofits. If these units are replaced by those using renewable fuels, or even natural gas, their GHG emissions will be much lower than those of existing units. Because no one knows how many units will be retired and replaced by cleaner fuels, it is impossible for the 2012 version of IPM to predict with any accuracy an upstream electricity GHG emissions rate for 2025. [EPA-HQ-OAR-2010-0799-9584-A2, p. 7]

EPA notes that it is considering running IPM with "more robust" vehicle and vehicle charging specific assumptions to generate a "better" electricity upstream emissions factor for the final rule. Id. Unless EPA dramatically changes its assumptions about the makeup of the generating fleet in 2025 to better reflect current and expected regulations, any additional IPM runs – even those using updated vehicle and charging assumptions – will be equally unable to provide an upstream electricity GHG emissions rate that has any relationship to actual emissions in 2025. If EPA does decide to conduct additional IPM runs for the final rule, the Agency must do more than update vehicle and charging assumptions, and any and all changes in the assumptions must be subject to notice and comment. A discussion of appropriate assumptions related to EV upstream emissions is included in section III, infra. [EPA-HQ-OAR-2010-0799-9584-A2, p. 8]

If EPA persists in using an upstream electricity GHG emissions rate, there is no regulatory purpose served by calculating a 2025 rate that is, on its face, inaccurate now. The Agency would be better served by waiting until MY 2021 to estimate upstream GHG electricity emissions, using actual emissions data and the most up-to-date information about the EGU generating fleet. EPA easily could conduct this analysis concurrently with the planned midterm evaluation of the vehicle standards necessary to support NHTSA's required, separate rulemaking to establish CAFE standards for MY 2022-2025. See 76 Fed. Reg. at 74879. [EPA-HQ-OAR-2010-0799-9584-A2, p. 8]

III. EPA's Approach To Upstream EV Emissions Related To Electricity Generation Is Flawed And Must Be Revised.

The tailpipe emissions of EVs (and PHEVs operating in an all-electric mode) are 0.0 g/mile, for both GHG emissions and criteria air pollutant emissions. Despite this, EPA asserts that it must consider the upstream GHG emissions related to the grid electricity and that these upstream emissions are higher than those associated with the production and distribution of gasoline. See 76 Fed. Reg. at 75010. [EPA-HQ-OAR-2010-0799-9584-A2, p. 9]

Upstream GHG emissions related to electricity production are only part of the analysis, however, and by focusing on upstream emissions only for EVs, EPA underestimates the overall environmental benefits of EVs. Upstream electricity GHG emissions are only relevant to the extent that EPA considers all upstream emissions from all fuels, which EPA does not do. When compared on a well (EGU)-to-tailpipe basis, EV GHG emissions are less than those of conventional vehicles. [EPA-HQ-OAR-2010-0799-9584-A2, p. 10]

Contrary to EPA's assertions, expanded introduction of EVs into all classes and categories of vehicles will serve to reduce GHG emissions significantly from the transportation sector, not dilute vehicle emissions standards, as EPA asserts. See Electric Power Research Institute (EPRI)-

National Resourced Defense Council, Joint Technical Report, Environmental Assessment of Plug-in Hybrid Electric Vehicles, Vol. 1: Nationwide Greenhouse Gas Emissions.6 In the Draft Environmental Impact Statement (EIS) (at 6-22), NHTSA concludes that the literature review reveals an overarching conclusion about the GHG emissions from EVs compared to conventional vehicle: "[E]ven in modeled scenarios in which EVs charge from a carbonintensive grid mix (i.e., electricity generated mostly from coal power plants), the vehicle lifecycle emissions from EVs are less than conventional gasoline vehicles." [EPA-HQ-OAR-2010-0799-9584-A2, p. 10]

Even if EPA were to compare the overall emissions of conventional vehicles and EVs fairly, EPA first would have to revise its assessment of EV emissions. EPA's current approach to EV emissions is unfair, inappropriate, and based on flawed data and assumptions. If EPA believes that upstream emissions must be discussed in the context of vehicle standards and decides to consider all emissions from all fuels, EPA must revise the final rule to provide a full and accurate discussion that leads to a fair comparison of the upstream emissions for all vehicle fuels and recognizes the environmental benefits of EV deployment. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 10-11]

A. EPA Has Failed To Consider the Transition of the Generating Fleet in Response to Environmental Regulations.

For many reasons, the U.S. electric generating fleet in MY 2025 will be significantly cleaner than the fleet of 2012: [EPA-HQ-OAR-2010-0799-9584-A2, p. 11]

Increased regulation of criteria air pollutant emissions, via more stringent standards under the CAA to address national ambient air quality standards for sulfur dioxide, nitrogen oxides, particulate matter; new hazardous air pollutant regulations addressing mercury, acid gases, non-mercury metals and other pollutants; new standards to address the interstate transport of air pollution; and more stringent standards to address ozone and opacity.

Regulation of GHG emissions from new sources and the existing fleet under two separate

CAA programs, NSPS and the new source review/prevention of significant deterioration pre-construction permitting programs.

Regulation of coal combustion residuals.

More stringent effluent guidelines and cooling water intake structure regulations.

Increased deployment of high-efficiency natural gas combined cycle units to provide additional generating capacity and replace retired coal units.

Increased deployment of renewable generation to comply with state renewable portfolio standard (RPS) or renewable electricity standard (RES) requirements. [EPA-HQ-OAR-2010-0799-9584-A2, p. 11]

These trends towards increasingly clean generation are evident in the recent projections from the Energy Information Administration (EIA) in its Annual Energy Outlook 2011. In EIA's Reference Case, average emissions intensity, per unit of electricity generated, for the U.S. electric power sector is projected to fall between 2010 and 2020 by 40.4 percent for sulfur dioxide, 26.5 percent for nitrous oxide, 36.9 percent for mercury and 7.9 percent for carbon dioxide.7 And because EIA's Reference Case generally assumes that current laws and regulations remain unchanged throughout the projections, these calculated improvements would likely be greater if EIA took into consideration all of the air quality rules that have been finalized in recent years and are expected to be finalized in the next several years, as well as clean energy technology improvements and cost reduction. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 11-12]

EPA also states that it is appropriate to consider upstream EV emissions because currently there is no national, comprehensive program addressing GHG emissions from the electric sector. See 75 Fed. Reg. at 75010, 75011. EPA's focus on the existence of a "current" national regulatory program addressing GHGs related to electricity production and distribution is not appropriate in the context of vehicle rules covering MY 2017-2025. But, there are no comprehensive GHG emissions control programs for any fuel sector today. [EPA-HQ-OAR-2010-0799-9584-A2, p. 12]

Moreover, it appears that the electric sector will become subject to GHG regulations sooner than other fuel sectors. Under the terms of a settlement agreement signed in late 2010, EPA is in the process of designing proposed GHG NSPS for all fossil fuel-based EGUs. These standards will apply to new units and major modifications, as well as the existing fleet. While EPA has missed the original deadline for proposing the GHG NSPS, at least the new and modified source parts of the rule are expected to be released imminently. The entire GHG NSPS program is expected to be in place within the next few years, well before the MY 2017 standards take effect. In the proposed rule, EPA fails to acknowledge these standards and their effect on electricity generation during the time period covered by the proposed MY 2017-2025 standards. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 12-13]

B. Unless EPA Considers the Upstream Emissions Related to Other Fuels, EPA Cannot Purport to Compare EV and Conventional Vehicles.

Moreover, EPA asserts that the "overall GHG emissions" associated with the generation and distribution of electricity are higher than the upstream emissions associated with the production and distribution of gasoline. See 75 Fed. Reg. at 75010, 75011. Not only is this statement unsupported by any facts or analysis, but it difficult to see how EPA can make such a comparison when the Agency has failed to include, by its own admission, an examination of the overall GHG emissions related to the production and distribution of other transportation fuels. In the proposed rule, the Agency acknowledges that 20 percent of the GHG emissions from traditional fuel vehicles are related to upstream fuel production and distribution, see id., but provides no evidence that these emissions were considered when making comparative statements about the upstream emissions for EVs. This undermines EPA's determination that considering upstream GHG emissions related to electric vehicles is appropriate because of the "higher" upstream GHG emissions associated with electricity production and distribution. See id. EPA cannot compare upstream emissions of the various vehicle fuels unless that comparison is a fair comparison – and EPA has acknowledged that it is not. At minimum, if EPA is going to consider upstream emissions, the Agency should not make broad statements purporting to compare the "overall GHG emissions" related to electricity with the "overall GHG emissions" of other fuels unless and until the Agency's analysis includes upstream emissions related to conventional fuels. [EPA-HQ-OAR-2010-0799-9584-A2, p. 13]

C. EPA Does Not Use Recent Electricity Emissions Data and Has Failed to Consider Regional Variation in Electricity Generation and Likely EV Charging Timing Patterns.

Even if EPA were to conduct a fair comparison of the upstream GHG emissions between EVs and conventional vehicles, EPA first would have to revise significantly how the Agency estimates upstream emissions related to electricity generation. EPA's assumptions about the upstream emissions related to the grid electricity that will be used to charge MY 2017-2025 are based on outdated and incomplete electricity generation data; do not address regional variability in the generating fleet or likely EV charging patterns; and do not take into consideration the expected composition of the electric generating fleet during the periods covered by the proposed standards. Unless and until EPA revises these assumptions, any comparison between the upstream emissions of EVs and conventional vehicles is fundamentally flawed and cannot serve as the basis for reasonable regulatory action. [EPA-HQ-OAR-2010-0799-9584-A2, p. 14]

First, EPA has used outdated data to support its assessment of the upstream GHG emissions related to EVs. EPA used eGRID2007 emissions factors, which contains electric generation emissions data from calendar year 2005. See 76 Fed. Reg. at 75012. Using 2005 data quite clearly skewed the national average electricity upstream GHG emissions rate that EPA calculated for comparative purposes. For example, according to EIA, total carbon dioxide emissions from electric generation were 8.6 percent lower in 2009 compared to 2008 (and declined by nearly 10.8 percent between 2005 and 2009).8 [EPA-HQ-OAR-2010-0799-9584-A2, p. 14]

But even if EPA used 2011 emissions data, the more current data have no bearing on the GHG emissions from electricity production in MY 2017 and beyond. As noted, the electric generation in the U.S. has and will continue to become cleaner over time. This results from many factors, including renewable energy policies enacted by many states, more stringent EPA regulation, and even the low cost of natural gas, which has been displacing coal in many markets. EPA's analysis fails to recognize these changes in the electric generation fleet. At a minimum, EPA should wait until the Agency can more reasonably obtain data for the period covered by the vehicle standards, considering all environmental requirements that will be in effect, as well as fuel generation patterns, as discussed above. [EPA-HQ-OAR-2010-0799-9584-A2, p. 15]

Second, EPA's creation and use of a national average electricity upstream GHG emissions rate fails to account for significant regional differences in electricity generation. Emissions associated with the generation of electricity vary significantly from utility to utility—with nuclear, wind, solar, geothermal and hydroelectric power sources emitting extremely low or no GHGs or criteria air pollutants. Any meaningful estimates of upstream emissions associated with electricity as a transportation fuel would need to be tailored not only to reflect regional variations in current electricity baseload (and peak load) generation and expectations for marginal electricity generation mix, but also developments in usage and recharging of the vehicle (as more "smart meters" and "smart chargers" are installed), as well as state and federal electric generation policies (such as state RPS and RES requirements)9 and state and regional/federal GHG emissions limits and reductions programs (e.g., California's A.B. 32, the New England Regional Greenhouse Gas Initiative and the federal CAA). [EPA-HQ-OAR-2010-0799-9584-A2, pp. 15-16]

In the proposed rule, EPA acknowledges that there is "significant regional variation with upstream GHG emissions associated with electricity production and distribution." See 76 Fed. Reg. at 75010 n.280. Accordingly, given this recognition, it is unreasonable for EPA to continue to use a nationwide average emissions rate. Any analysis of upstream electricity GHG emissions methodology for estimating upstream emissions rates must take the significant orders of magnitude of regional variability into account. [EPA-HQ-OAR-2010-0799-9584-A2, p. 16]

Regional variations in generating resources must be considered, especially with respect to the areas of the country with the highest expected near-term EV deployment rates. For example, California's average upstream GHG electricity emissions rate is significantly lower than that of other parts of the country, as EPA recognizes in the proposed rule. See 76 Fed. Reg. at 75011. California also is expected to have one of the highest rates of EV adoption.10 In 2011, California residents purchased more than 60 percent of the Nissan Leafs and about 30 percent of the Chevrolet Volts sold in the U.S.11 California also recently adopted aggressive regulations that are intended to put 1.4 million EVs, PHEVs and hydrogen vehicles on the state's roads by 2025.12 As a result, any analysis that uses national average upstream electricity GHG emissions to estimate the environmental impacts of early EV deployment is, by definition, overestimating these emissions. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 16-17]

A recent graphic from the California Air Resources Board (CARB) report demonstrates the superior emissions benefits of EVs and PHEVs in California.13 [See figure on p. 17 of Docket number EPA-HQ-OAR-2010-0799-9584-A2.] [EPA-HQ-OAR-2010-0799-9584-A2, p. 17]

In addition, using nationwide average upstream GHG emissions would be inconsistent with previous Agency action to address fuel economy labels for LDVs. In that rulemaking, EPA concluded that "[d]ue to different electric generation fuels and technologies, this level of [regional generation] variation is significant; from one region to another, the highest-to-lowest upstream average GHG emission ratios are roughly 3-to-1. If examined from a utility-by-utility perspective, the ratio is even greater, at 75-to-1. For a national label to present a single national average would be misleading and inaccurate given such a wide range." Revisions and Additions to Motor Vehicle Fuel Economy Labels, 76 Fed. Reg. 39478, 39493 (July 6, 2011). [EPA-HQ-OAR-2010-0799-9584-A2, p. 18]

Finally, EPA must also take into consideration the effects on upstream emissions rates of expected EV charging patterns. EV charging is likely to take place at night,14 when overall national GHG emissions related to electricity generation are lower because most wind power is generated at night15 and because baseload nuclear generating units do not cycle and are always operating.16 Electric utilities also are incenting night EV charging through time-of-day electricity rates and separate EV rates, which are significantly lower at night when overall electricity demand is lower. In addition, increased installation and use of smart meters in the coming years, funded in large measure with stimulus funds administered by DOE, also will help to facilitate charging EVs at home at night. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 18-19]

IV. Conclusion

EEI appreciates EPA's efforts to incentivize the manufacture and deployment of EVs and EPA's recognition of the potential for EVs to revolutionize the transportation sector by reducing GHG and other criteria pollutant emissions and reducing U.S. dependence on imported oil. EPA's overall assessment of the environmental impacts of EVs is flawed, however, and should be revised. If EPA's assumptions about the upstream GHG emissions related to the generation of the electricity that will be used to power EVs were consistent with scientific literature, used appropriate and accurate information about the current and future generating fleet and recognized regional variability in electricity generation and expected charging timing patters, EPA would conclude that increased EV deployment will enhance GHG reductions in the transportation sector. [EPA-HQ-OAR-2010-0799-9584-A2, p. 19]

---

3 Upstream emissions related to oil production have been a central part of the debate over the Keystone pipeline.

4 See Department of Energy, Alternative Fuels & Advanced Vehicles Data Center, Natural Gas Emissions, available at: http://www.afdc.energy.gov/afdc/vehicles/natural_gas_emissions.html.

5 For an assessment of the upstream emissions related to natural production and transportation from the Center for Transportation Research, Argonne National Laboratory, see A. Burnham et al., Life-cycle Greenhouse Gas Emissions of Shale Gas, Natural Gas, Coal and Petroleum, 46 Envtl. Sci. & Tech. 619 (2012), available at: http://www.transportation.anl.gov/pdfs/EE/797.PDF.

6 Available at: http://my.epri.com/portal/server.pt?Abstract_id=000000000001015325. It is important to note that the EPRI-NRDC study focused on PHEVs and did not include EVs. If it had included EVs, its conclusions about reduced GHG emissions would have been even more robust.

7 EIA, Annual Energy Outlook 2011 (Apr. 2011), Reference Case Scenario ref2011, Datekey d0202011a, compiled from Tables 8, 18, available at: http://eia.gov/forecasts/aeo/excel/yearbyyear.xls.

8 EIA, Electric Power Annual 2009 8 (Apr. 2011), available at http://www.eia.gov/cneaf/electricity/epa/epa.pdf.

9 As of 2011, 29 states and D.C. have RPS or RES requirements and seven additional states have non-binding renewable generation goals. Existing RPs or RES requirements applied to 47 percent of U.S. load in 2010; when these requirements are fully implemented, these obligations will apply to 56 percent of load. See R. Wiser, "State of the States: Update on RPS Policies and

Progress" (Oct. 20, 2010), available at: http://www.renewableenergymarkets.com/docs/presentations/2010/Wed_State%20of%20the%20Markets_Ryan%20Wiser.pdf.

10 See EPRI, Transportation Electrification: A Technology Overview 4-10 (2011), available at: http://my.epri.com/portal/server.pt?Abstract_id=000000000001021334. EPRI also states that Oregon and Washington, D.C. are expected to have higher early EV adoption rates.

11 See Jerry Hirsch, Chevrolet Plans Special Volt to Qualify for Carpool Sticker, Rebate, Los Angeles Times, Jan. 19, 2012, available at: http://www.latimes.com/business/money/la-fi-mochevrolet- volt-20120119,0,6323739.story.

12 For more information, see http://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/consumer_acc.htm.

13 CARB, Advanced Clean Cars: the Zero Emission Vehicle (ZEV) Regulation, Fact Sheet, available at: http://www.arb.ca.gov/msprog/zevprog/factsheets/general_zev_2_2012.pdf

14 Researchers at the Department of Energy's (DOE) Argonne National Laboratory used data from the 2001 National Household Transportation Study to determine likely charging scenarios. They found that more than 60 percent of vehicles end their last trip after 5 p.m. and 70 percent after 4 p.m. More than half of these vehicles begin their first trip between 6 and 9 a.m. See A. Elgowainy, et al., Well-to-Wheels Analysis of Energy Use and Greenhouse Gas Emissions of Pug-In Hybrid Electric Vehicles, Energy Systems Division, Argonne National Laboratory, ANL/ESD/10-1 (June 2010), available at: http://www.transportation.anl.gov/pdfs/TA/629.PDF.

15 See K. Coughlin & J. Eto, Analysis of Wind Power and Load Data at Multiple Time Scales, Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, LBNL-4147E, 4 (Dec. 2010) (noting the "common features of wind power: regular diurnal pattern with stronger winds at night…"), available at: http://www.ferc.gov/industries/electric/indusact/ reliability/analysiswindpowerload.pdf. Indeed, NHTSA's analysis also fails to consider how EVs, especially PHEVs, can help better integrate more variable resources, like wind, into the grid, further de-carbonizing electricity generation. See, e.g., F. Tuffner & M. Kintner-Meyer, Using Electric Vehicles to Meet Balancing Requirements Associated with Wind Power, DOE, PNNL-20501 (July 2011), available at: http://energyenvironment.pnnl.gov/pdf/PNNL-20501_Renewables_Integration_Report_Final_7_8_2011.pdf.

16 Nuclear power plants essentially run continuously. This is because their power output cannot be ramped up and down readily on a daily and weekly basis. As a result, at night, when electric demand is lower, nuclear units continue to run and other forms of generation are backed off. See the World Nuclear Association's website for more information: http://world-nuclear.org/.

Organization: Electric Drive Transportation Association

While EDTA supports the overall direction of the proposed regulations, EDTA has three significant concerns with the proposal:

First, EDTA opposes the proposal to include upstream emissions when determining the "compliance value" for light-duty vehicles pursuant to these regulations. The proposal to include upstream emissions exceeds EPA's authority under Title II of the Clean Air Act. This proposal also lacks a rational basis because of the inherent uncertainties involved in calculating upstream emissions, and is arbitrary because it does not adequately account for the upstream emissions of conventionally fueled vehicles. [EPA-HQ-OAR-2010-0799-9449-A1, pp. 1-2]

Second, EDTA opposes the automatic phase-out of the multiplier for electric drive vehicles. The phase-out schedule in the proposed regulations is predicated on the assumption that the multiplier will become unnecessary by the year 2022. While it is possible that electric drive vehicles will gain widespread adoption by that year, the pace of adoption is uncertain and will be impacted by economic factors outside of the control of vehicle manufacturers, such as the price of conventional motor fuels. Given the inherent uncertainty in predicting the underlying economic trends that affect this industry, EDTA recommends that the multiplier be established for the full period covered by this rule (through 2025), subject to modification in a separate rulemaking following a mid-term review. [EPA-HQ-OAR-2010-0799-9449-A1, p. 2]

Third, EDTA opposes NHTSA's determination that it lacks authority to include a multiplier as part of its CAFE standards under EPCA and EISA. While these statutes do provide for certain incentives, they do not preclude NHTSA from establishing additional incentives, such as a multiplier. Adoption of a multiplier in NHTSA's rule would promote the fundamental policy of developing a harmonized national system in which EPA and NHTSA establish consistent regulatory requirements. [EPA-HQ-OAR-2010-0799-9449-A1, p. 2]

In addition, while we support the use of the utility factor methodology developed by the Society for Automotive Engineers (SAE), we encourage EPA to ensure the manufacturers are given an adequate opportunity to participate in determining the utility factor for each vehicle model. We also encourage EPA to ensure that its approach to determining the utility factor is harmonized with the ongoing efforts of the California Air Resources Board. [EPA-HQ-OAR-2010-0799-9449-A1, p. 2]

1. Upstream Emissions.

EPA's proposed rule would provide a temporary incentive for (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCVs) – that is, electric drive vehicles – by allowing manufacturers to use a compliance value of 0 grams per mile (g/mile) when calculating GHG emissions for those vehicles. This provision will allow the 0 g/mile compliance value to be used for an unlimited number of vehicles in MY 2017-2021. But from 2022 onward, there would be a cap on the number of vehicles that could qualify for the 0 g/mile assumption. If sales exceed the cap in MY 2022 and afterward, the GHG emissions calculation for those vehicles would be required to include an amount equivalent to "net upstream emissions." [EPA-HQ-OAR-2010-0799-9449-A1, p. 2]

EDTA supports the proposal to establish a zero-emission compliance value for MYs 2017-2021, but opposes the proposal to include upstream emissions in the compliance values for vehicles above the cap in MY 2022 and beyond. Upstream emissions should not be included in determining the compliance value because (1) EPA has authority under Title II of the Clean Air Act only to set emissions standards based on emissions from the vehicle itself, not upstream emissions; (2) EPA has not established an accepted methodology for calculating upstream emissions for individual makes and models of light-duty-vehicles; (3) it is arbitrary to include upstream emissions for electric drive vehicles, when such emissions are not regulated for other types of vehicles; and (4) any method for allocating the proposed cap could create uncertainty and adversely affect competition among vehicle manufacturers. [EPA-HQ-OAR-2010-0799-9449-A1, p. 2]

a. EPA Lacks Authority to Include Upstream Emissions.

The proposed GHG emission standards are based on EPA's authority to regulate motor vehicle emissions under Section 202(a) of the Clean Air Act, 42 U.S.C. § 7521(a). Section 202(a) gives EPA authority to set "standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines …." Id. (emphasis added). The plain language of Section 202(a) authorizes EPA to set emission standards applicable to emissions "from" a vehicle – i.e., tailpipe emissions. There is nothing in Section 202(a) that states or implies that EPA can set emission standards for a vehicle based on emissions that come from power plants or other upstream sources and are not "from" the vehicle. [EPA-HQ-OAR-2010-0799-9449-A1, p. 3]

This reading of Section 202(a) is supported by other provisions in Title II of the Clean Air Act. For example, Section 206 provides for the testing of vehicles to determine whether they conform to the emission standards established by EPA. Section 206 states that EPA "shall" test or require to be tested any new motor vehicle or engine upon request of a manufacturer, and "shall" issue a certificate of conformity to the manufacturer if the vehicle or engine conforms to the regulations issued under Section 202(a). This provision makes clear that EPA is required to issue a certificate of conformity for a vehicle if the emissions from the vehicle comply with the EPA-prescribed emissions test. Section 206 does not give EPA discretion to establish an emissions test that imputes to a vehicle emissions that do not come from the vehicle itself, nor does it give EPA discretion to deny a certificate of conformity for a vehicle that passes the emissions test. Similarly, Section 207 authorizes EPA to establish the emissions test that is used for determining "whether, when in actual use throughout its warranty period, each vehicle and engine … complies with the emissions standards" set in the regulations issued under Section 202. This language in Section 207 requires the emissions test to be based on emissions from the vehicle itself, and leaves no discretion for EPA to establish an emissions test that imputes to a vehicle emissions released by power plants or other sources. [EPA-HQ-OAR-2010-0799-9449-A1, p. 3]

The overall structure of the Clean Air Act also confirms that Title II only gives EPA authority to set standards for emissions that come directly from motor vehicles. Congress created a comprehensive scheme to regulate emissions from a wide range of sources. Title I authorizes EPA to set emissions standards for stationary sources; Title II authorizes EPA to set emissions standards for mobile sources.1 There are many end-users of electricity whose activities could be associated with "upstream" emissions from power plants, but to date EPA has not sought to impute the power plants' emissions to the end-users of the power generated by those plants. Rather, EPA has interpreted the statutory scheme to require regulation of power plant emissions at the source, not at the end-user. This approach is not only consistent with the structure of the Act; it also makes practical sense, because end users have no ability to control upstream emissions. [EPA-HQ-OAR-2010-0799-9449-A1, p. 3]

Notwithstanding the plain language of Section 202(a) and the structure of the Clean Air Act, EPA asserts in this rulemaking that it has authority to include upstream emissions when establishing the compliance value for light-duty vehicles. The proposed rule itself does not articulate the legal basis for this assertion of authority. In its previous rulemaking for MYs 2012-2016, EPA asserted in response to a comment that it has “broad discretion” to set GHG emission standards for light-duty vehicles under Section 202, including the authority to base compliance values on an assumed level of upstream emissions. (See 75 Fed. Reg. 75437). We respectfully disagree with that conclusion because it is contrary to the language and intent of the Clean Air Act. For the reasons stated above, Title II of the Act only gives EPA authority to set standards governing emissions “from” the vehicle itself. [EPA-HQ-OAR-2010-0799-9449-A1, pp. 3-4]

b. EPA's Proposed Methodology for Estimating Upstream Emissions is Arbitrary.

Even if EPA were authorized to include upstream emissions when setting standards for vehicle emissions under Title II, such a requirement would be permissible only if EPA could articulate a non-arbitrary basis for estimating the upstream emissions for each vehicle model covered by the regulations. The “four-step methodology” proposed in this rule falls far short of this requirement. Rather than describing a methodology for estimating the upstream emissions associated with each vehicle, the proposed rule requires a single national average to be used as the basis for estimating upstream emissions for all vehicles. (76 Fed. Reg. 75014) (requiring use of “2025 nationwide average electricity upstream GHG emissions rate of 0.574 grams/watt-hour at the powerplant”). [EPA-HQ-OAR-2010-0799-9449-A1, p. 4]

This national average – or any national average for that matter – fails to take into account the wide variation in actual “upstream emissions” among different regions, demographic groups, and vehicle types. The fundamental point is that average GHG emissions from electricity generation are not necessarily representative of the incremental emissions resulting from the charging of a particular vehicle or vehicle model. The additional emissions associated with charging a particular vehicle or vehicle model will depend on many factors. First, any estimate of upstream emissions would need to take into account the geographic distribution of the users of the vehicles, since the electricity generation mix varies considerably by region. In addition, it would need to take into account the expected driving habits and charging habits of those users, which could vary significantly for different vehicle models. It also would need to take into account a host of capital investment and operational decisions made by electric utilities and grid operators, including decisions about the electricity generation mix for both base load and peak load that are made on a daily basis in managing the grid, and over time, in planning the energy inventory of a service territory. [EPA-HQ-OAR-2010-0799-9449-A1, p. 4]

To avoid arbitrariness, any calculation of upstream emissions would need to be customized to reflect these factors with regard to each vehicle model in a manufacturer’s fleet. To date, no such methodology has been developed, and indeed it may not be possible to credibly do so. In the absence of a statistically reliable methodology for calculating upstream emissions for each vehicle model, it would be arbitrary for EPA to require upstream emissions to be included as part of the compliance value for electric drive vehicles. [EPA-HQ-OAR-2010-0799-9449-A1, p. 4]

c. EPA's Proposal is Also Flawed Because it Would Not Apply Equally to All Vehicle Types.

An additional flaw in the proposed rule is the fact that it requires upstream emissions to be included for electric drive vehicles in spite of the fact that this has never been done for conventionally fueled vehicles. Even if EPA were authorized to regulate upstream emissions under Title II, any such system would need to apply evenhandedly to all categories of vehicles, including those that use petroleum fuel. [EPA-HQ-OAR-2010-0799-9449-A1, p. 4]

The proposed regulations seek to address this concern by requiring the upstream emissions for a "comparable midsize gasoline vehicle" to be deducted from the upstream emissions for an electric drive vehicle. (*See* 76 Fed. Reg. 75014.) This methodology would mitigate, but not eliminate, the arbitrariness inherent in requiring upstream emissions to be included for some vehicles but not others. By EPA's own logic, this methodology would understate the GHG emissions of *both* gasoline vehicles and electric drive vehicles.
In short, we see no justification for imposing this upstream emission requirement on electric vehi cles alone. [EPA-HQ-OAR-2010-0799-9449-A1, pp. 4-5]

d. Allocating a Cap Could Create Uncertainty and Adversely Affect Competition.

Finally, the proposed methods for allocating a cap would create uncertainty among manufacturers and could distort competition. An industry-wide cap is especially problematic, because each manufacturer's cap would depend on that manufacturer's relative share of the market, not its absolute sales volume; a cap based on relative share is very difficult for a manufacturer to predict, because it is tied to decisions made by other manufacturers. The proposed company-specific cap would provide greater certainty, but it has drawbacks as well. Any company-specific cap is potentially market-distorting, because it could enable a manufacturer to lock in a multi-year competitive advantage (in the form of a much higher cap) based on that manufacturer's sales of electric drive vehicles in the years immediately following adoption of these regulations. While advantageous to that manufacturer, such a system would conflict with the goal of free and open competition. These practical difficulties with allocating a cap provide a further basis for eliminating the cap and instead allowing all vehicles to qualify for the zero-emissions compliance value.

For all of these reasons, EDTA recommends that the rule provide a zero-emissions compliance value for electric drive vehicles for the full period covered by this rule, MYs 2017-2025. [EPA-HQ-OAR-2010-0799-9449-A1, p. 5]

2. Phase-Out of Multiplier for EVs, PHEVs, and FCVs.

For MY 2017-2021, EPA is proposing an incentive multiplier for all electric drive vehicles to facilitate market penetration of the most advanced vehicles as rapidly as possible. This multiplier approach means that each EV, PHEV, and FCV would count as more than one vehicle in the manufacturer's compliance calculation. For EVs and FCVs, the multiplier would be 2.0 from MY 2017 to MY 2019, at which point it will be phased down to 1.75 in 2020 and 1.50 in 2021; in 2022 and later, it would be 1.0 (i.e., no multiplier). For qualifying PHEVs, the multiplier would be 1.6 from 2017-2019, 1.45 in 2020, 1.3 in 2021, and 1.0 from 2022 onward. To qualify for the multiplier, a PHEV would need to complete a full EPA highway test (10.2 miles), without using any conventional fuel, or alternatively, have a minimum equivalent all-electric range of 10.2 miles as measured on the EPA highway cycle. [EPA-HQ-OAR-2010-0799-9449-A1, p. 5]

The rationale for the multiplier, as described in the proposed rule, is that a multiplier is needed as an incentive to accelerate the commercialization and widespread adoption of EVs, PHEVs, and FCVs. EDTA concurs that this incentive is needed, but opposes automatic termination of this incentive in 2021. There is significant uncertainty in making multi-year market predictions; in this case, the uncertainty is compounded by the fact that electric drive technology and markets are just emerging. Moreover, expanding electric drive vehicle capacity will require substantial investments and long-term planning by manufacturers and other industry participants. The incentive to encourage those investments should be similarly long-term and not subject to an arbitrary time limit. [EPA-HQ-OAR-2010-0799-9449-A1, p. 5]

For these reasons, EDTA recommends that the multiplier be extended at its initial level throughout the full time period covered by these regulations (through MY 2025), subject to mid-term review. If EPA determines through its mid-term review of actual market conditions that the incentive is no longer needed or should be reduced, it could make that change through a separate rulemaking. [EPA-HQ-OAR-2010-0799-9449-A1, pp. 5-6]

In short, rather than arbitrarily building in a phase-out schedule, the rule should include a trigger for a new rulemaking to reduce the multiplier *if* EPA determines – based on sales volumes of electric drive vehicles – that the multiplier is no longer needed. This approach will ensure that the multiplier remains in effect as long as it is needed, while also providing a mechanism to reduce or eliminate the multiplier when it is warranted. [EPA-HQ-OAR-2010-0799-9449-A1, p. 6]

3. NHTSA Authority to Establish a Multiplier.

EDTA also objects to NHTSA's determination that it lacks authority to establish a multiplier in the fuel economy regulations under EPCA and EISA. The preamble to the proposed rule states that: "NHTSA currently interprets EPCA and EISA as precluding the agency from offering additional incentives for EVs, FCVs and PHEVs, except as specified by statute, and thus is not proposing incentive multipliers comparable to the EPA incentive multipliers described above." (76 Fed. Reg. 74878). This statement is accompanied by a footnote, which states that: [EPA-HQ-OAR-2010-0799-9449-A1, p. 6]

Because 49 U.S.C. 32904(a)(2)(B) expressly requires EPA to calculate the fuel economy of electric vehicles using the Petroleum Equivalency Factor developed by DOE, which contains an incentive for electric operation already, and because 49 U.S.C. 32905(a) expressly requires EPA to calculate the fuel economy of FCVs using a specified incentive, NHTSA believes that

Congress' having provided clear incentives for these technologies in the CAFE program suggests that additional incentives beyond those would not be consistent with Congress' intent. Similarly, because the fuel economy of PHEVs' electric operation must also be calculated using DOE's PEF, the incentive for electric operation appears to already be inherent in the statutory structure.(76 Fed. Reg. 74878, at footnote 56). [EPA-HQ-OAR-2010-0799-9449-A1, p. 6]

EDTA disagrees that these statutory provisions preclude NHTSA from including an incentive multiplier for EVs, PHEVs, and FCVs in its CAFE regulations. As NHTSA acknowledges in the proposal, "the President's National Fuel Efficiency Policy announcement of May 19, 2009…called for harmonized rules for all automakers…." (76 Fed. Reg. 75164). Consistent with this directive, NHTSA should, wherever possible, interpret its authority in a manner that is consistent with the establishment of a single, consistent national program, with requirements that parallel those established by EPA. [EPA-HQ-OAR-2010-0799-9449-A1, p. 6]

The interpretation of EPCA and EISA offered in footnote 56 falls short in this regard. 42 U.S.C § 32904(a)(2)(B) merely directs NHTSA to "include" equivalent petroleum-based fuel economy values in its calculation of average fuel economy for electric vehicles. This section contains no "exclusivity" language, nor does it even imply an intent to preclude other incentives. From a practical standpoint, there is nothing that prevents NHTSA from complying with this statutory directive and also promulgating a regulatory incentive multiplier to harmonize with EPA's program. The same holds true for 42 U.S.C. § 32905(a), which directs NHTSA to use a specific equivalency factor for liquid alternative fuel. This language does not otherwise constrain NHTSA's authority; NHTSA can comply with this statutory directive *and* comply with the President's directive to harmonize the CAFE and GHG programs. EDTA strongly encourages NHTSA to reconsider its interpretation of its governing statutes in light of the President's harmonization policy. EDTA does not believe that EPCA or EISA presents a barrier to the adoption by NHTSA of an incentive multiplier for advanced technology vehicles, consistent with EPA's proposal. [EPA-HQ-OAR-2010-0799-9449-A1, p. 6]

---

1. In the proposed rule, EPA implies that it needs to address upstream GHG emissions from motor vehicles as part of the emission standards under Title II of the Clean Air Act because that "[a]t this time ... there is no such comprehensive program addressing upstream emissions of GHGs." (See 76 Fed. Reg. at 75010). In fact, EPA has taken several steps to regulate the GHG emissions of stationary sources, including rulemakings under the Prevention of Significant Deterioration and Title V Operating Permit programs and the upcoming New Source Performance Standard for electric generating units. These programs directly regulate the GHG emissions of power plants. The fact that EPA is already regulating upstream GHG emissions contradicts the rationale offered in this rulemaking for addressing those emissions through the emission standards for motor vehicles.

Organization: Ferrari

We concur with EPA that believes it would be appropriate to provide an incentive to encourage the introduction of advanced technology vehicles (Electric Vehicles, Plug-in Hybrids, and Fuel

Cells), FFV and AFV vehicles and off-cycle technologies and that a credit mechanism is an effective way to do this. [EPA-HQ-OAR-2010-0799-9535-A2, p.14]

Organization: Fisker Automotive, Inc.

Fisker's solution to this conundrum is the electric vehicle with extended range (EVer), a powertrain that enables all-electric driving while eliminating the range anxiety that presents a hurdle to some buyers. We are proud to offer the Karma as the first electric vehicle with extended range in the premium luxury sedan segment. Not only does the Karma offer a world-class combination of style and luxury, but the Karma would allow Fisker to comply with the greenhouse gas standards proposed in this rulemaking for 2025 – today. [EPA-HQ-OAR-2010-0799-9266-A1, pp. 1-2]

As stated in the preamble to this rule, plug-in vehicles are one of the technologies that "have significant transportation GHG emissions and oil consumption game-changing potential in the longer run, and that also face major market barriers in entering a market that has been dominated by gasoline vehicle technology and infrastructure for over 100 years." Fisker Automotive is bringing to market today the type of vehicle that this rule is designed to support. [EPA-HQ-OAR-2010-0799-9266-A1, p. 2]

Encourage re-consideration of upstream emissions in the future

One of the rationales for accounting for upstream emissions (for those vehicles not subject to the incentive) is that "there is currently no program in place to reduce GHG emissions from electric powerplants." However, in the recently adopted amendments to California's GHG program for light-duty vehicles, the Air Resources Board (ARB) continued to hold automakers responsible for upstream emissions even in the context of a cap-and-trade program in that state to control GHG emissions from powerplants. As automakers have no control over the GHG intensity of electricity generation, we encourage EPA to consider a pathway in which tailpipe emissions and upstream emissions are controlled separately. For instance, if a national cap-and-trade program or other GHG control regulation is in place at the time of the proposed mid-term review, we would encourage both EPA and NHTSA to reconsider its treatment of upstream emissions. [EPA-HQ-OAR-2010-0799-9266-A1, p. 4]

Support incentive program for electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles as proposed

In the absence of a means of controlling GHG emissions upstream, Fisker supports the 0 g/mi upstream emissions incentive and the multipliers for years 2017-2021 as proposed. We believe the requirement that a PHEV be required to complete a full EPA highway test without using any conventional fuel – essentially a 10.2 mile All Electric Range (AER) – is an appropriate threshold to place for participation in the incentive program. [EPA-HQ-OAR-2010-0799-9266-A1, p. 5]

Organization: Ford Motor Company

Production Volume Multipliers: To promote the research, development and manufacture of advanced technology vehicles, Ford supports the proposal to provide production volume multipliers for electrified vehicles (full battery electric and plug-in hybrid electric vehicles) and fuel cell vehicles, at the levels proposed. As noted in the preamble, it is likely that these technologies will become increasingly important toward meeting the aggressive standards, and we further recommend that the continuation of the multipliers beyond 2021 model year be considered during the mid-term evaluation. [EPA-HQ-OAR-2010-0799-9463-A1, p. 18]

Upstream Emissions: Ford also supports the continuation of the accounting of the electric drive portion for battery electric and plug-in hybrid electric vehicles in the GHG equation as 0 grams/mile. However, just as traditional vehicles are certified based on their measured tailpipe emissions over the federal test procedures, without regard to the source of the gasoline on which they are operated, we do not believe it is appropriate to include upstream (e.g., utility) emissions in the vehicle greenhouse gas compliance calculation for electrified products. Therefore, the production volume caps, adopted for 2012-16 model years as well as those proposed for the 2022-2025 model years should be eliminated. [EPA-HQ-OAR-2010-0799-9463-A1, p. 19]

Auto manufacturers have no control over the emissions of the utility industry, but unique solutions for electric vehicles are being investigated which allow the customer to further reduce the “carbon footprint” of these vehicles independent of the local energy supply. For example, Ford has announced a partnership with SunPower to provide a high-efficiency rooftop solar system that could provide Focus Electric owners enough renewable energy production to offset the energy used for charging. Ford also has an established a partnership with Microsoft to develop technology that will allow the customer to easily charge vehicles when electricity rates are lowest, which typically corresponds to when the utilities have excess capacity in their system. Balancing utility load in such a manor improves the overall utility industry carbon footprint. Requiring manufacturers to bear the burden of another industry’s greenhouse gas emissions is not only inappropriate, it could potentially disincentivize innovations like these which provide a real world benefit. [EPA-HQ-OAR-2010-0799-9463-A1, p. 19]

Ford supports the comments provided by the EDTA, which raises the additional issues regarding EPA’s authority to include upstream emissions in a vehicle requirement and the proposed methodology for estimating the upstream emissions. [EPA-HQ-OAR-2010-0799-9463-A1, p. 19]

Definition of PHEV: EPA has proposed that a plug-in hybrid vehicle must meet a minimum “all electric range” limit of 10.2 miles in order to be eligible to utilize the production volume multiplier, and requested comments on this threshold and whether a different PHEV metric (such as battery capacity, ratio of electric motor power to engine, or total vehicle power) would be appropriate. Ford supports the minimum range requirement both as the appropriate metric for defining a PHEV for the purpose of the use of a volume multiplier, and at the level proposed (10.2 miles). Further, we support the proposal, as stated by EPA, that the minimum electric range may be optionally measured as equivalent all-electric range as measured on the EPA highway cycle. [EPA-HQ-OAR-2010-0799-9463-A1, p. 19]

NHTSA Incentives for Electric Vehicles, Plug-in Hybrids, and Fuel Cell Vehicles

NHTSA has also expressed the view that it lacks authority to establish an incentive multiplier for EVs, PHEVs, and FCVs, comparable to the one proposed by EPA, in the fuel economy regulations under EPCA and EISA. In this case, we disagree with NHTSA's interpretation of EPCA and EISA. In our view, the law does not address this issue, either directly or indirectly. Moreover, the President has directed EPA and NHTSA to coordinate and harmonize their regulations as much as possible. Consistent with that directive, the agencies should interpret statutes so as to optimize the degree of harmonization between the GHG program and the CAFE program. Thus, if one agency incorporates a program flexibility into its rules, the other agency should adopted a corresponding program flexibility unless expressly prohibited by law. We refer the agencies to the comments of EDTA on this point, which we support and incorporate by reference. [EPA-HQ-OAR-2010-0799-9463-A1, p. 21]

Organization: General Motors Company

GM supports the advanced technology volume multipliers as proposed, as well as the proposed definitions and metrics for electric, fuel cell and plug-in vehicles. GM recommends that all aspects of the advanced technology program should be fully examined in the mid-term review, and updated as appropriate. [EPA-HQ-OAR-2010-0799-9465-A1, p. 3]

GM does not believe that requiring automakers to account for upstream electricity carbon emissions should ever become a part of the agencies' vehicle regulatory programs. Vehicle compliance has been, and should continue to be, regulated at the vehicle emissions and consumption level. For the purposes of calculating a manufacturer's fleet average performance, GM strongly recommends that all upstream carbon emissions from the use of electricity be quantified as zero, for all model years, and for all vehicle volumes. [EPA-HQ-OAR-2010-0799-9465-A1, p. 3]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 36-37.]

Finally, a specific concern that we have with the proposal is related to the treatment of so-called upstream electricity emissions. EPA has couched the quantification of upstream emissions at 0.0 grams per mile as a 'flexibility' for automakers. This characterization is really inappropriate and could lead EPA at some point to reduce or eliminate this so-called flexibility. At its core, the problem is that the word flexibility suggests some measure of choice or control. However, automakers control neither the feedstocks nor the conversion processes for generating and creating electricity. Suggesting that at some point we could or should be responsible for these emissions is worrisome to us. To the degree that these emissions are going to be addressed by government, legislators and regulators need to create a program to do so directly, not indirectly through further restrictions on vehicles. With due respect, we have a tough job ahead of us as it is.

Organization: Growth Energy

Although not required by Congress in EISA or in the other statutes governing this rulemaking, the proposed standards in the Joint NPRM place great reliance on the production, sale and use of vehicles powered from the electrical grid, far exceeding any prior federal regulatory program. As noted above, the success or failure of the regulations that the Agencies are proposing will ultimately be determined by the consumer market for new motor vehicles. Insofar as the Agencies' program is based on regulatory templates from California, which has attempted for more than 20 years to implement requirements for widespread sale and use of pure electric vehicles, there is reason for great skepticism about the Joint NPRM's view that grid-powered electric vehicles (pure electric vehicles and plug-in hybrid vehicles) can provide a "game-changing" strategy to reduce GHG emissions and dependence on foreign oil. [EPA-HQ-OAR-2010-0799-9505-A1, p. 2]

This Attachment to the Comments of Growth Energy explains why EPA needs to reconsider its analysis of the electric vehicle component of the Joint Notice of Proposed Rulemaking (Joint NPRM). [EPA-HQ-OAR-2010-0799-9505-A1, p. 7]

As part of the Joint NPRM, EPA includes incentives for electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCVs) intended "To facilitate market penetration of the most advanced vehicle technologies as rapidly as possible…" EPA goes on to provide the following rationale for providing these incentives:

EPA has identified two vehicle powertrain-fuel combinations that have the future potential to transform the light-duty vehicle sector by achieving near-zero greenhouse gas (GHG) emissions and oil consumption in the longer term, but which face major near-term market barriers such as vehicle cost, fuel cost (in the case of fuel cell vehicles), the development of low-GHG fuel production and distribution infrastructure, and/or consumer acceptance.

- Electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) which would operate exclusively or frequently on grid electricity that could be produced from very low GHG emission feedstocks or processes.
- Fuel cell vehicles (FCVs) which would operate on hydrogen that could be produced from very low GHG emissions feedstocks or processes. [EPA-HQ-OAR-2010-0799-9505-A1, p. 7]

EPA believes that these advanced technologies represent potential game-changers with respect to control of transportation GHG emissions as they can combine an efficient vehicle propulsion system with the potential to use motor fuels produced from low-GHG emissions feedstocks or from fossil feedstocks with carbon capture and sequestration. [EPA-HQ-OAR-2010-0799-9505-A1, p. 8]

However, EPA also notes that during the 2017 to 2025 time frame that the production of the electricity and hydrogen required to power these vehicles:

…will decrease the overall GHG emissions reductions associated with the program as the upstream emissions associated with the generation and distribution of electricity are higher than the upstream emissions associated with production and distribution of gasoline… [EPA-HQ-OAR-2010-0799-9505-A1, p. 8] and quantifies the magnitude of these lost emission reductions as between 80 million and 120 million metric tons of CO_2 over the period from 2017 to 2025 alone. According to EPA, the loss in benefits associated with EV, PHEV, and FCV incentives equals 4 to 5% of the total GHG reductions expected from the proposed rule. [EPA-HQ-OAR-2010-0799-9505-A1, p. 8]

Given that EPA admits that the incentives it is providing for EVs, PHEVs, and FCVs will undermine the goal of the GHG regulation at least during the period from 2017 to 2025, the obvious question is why are these incentives being provided? The answer to this question is that as indicated above, EPA believes these advanced technologies are potential game-changing technologies. As discussed in detail below, not only does EPA overstate the potential GHG benefits of EVs, PHEVs, and FCVs, but the Agency fails to accurately address the serious challenges facing these vehicle technologies. As a result, EPA's decision to incentivize these technologies seems completely at odds with the goal of the proposed rule, which is to lower GHG emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 8]

In contrast, the proposed rule ignores the fact that vehicles designed to operate on ethanol-blended fuels are truly "…potential game-changers with respect to control of transportation GHG emissions…" Given this, EPA must modify the proposed rule to provide incentives that will ensure that vehicles capable of operation on ethanol blends continue to enter the vehicle fleet in substantial numbers so that the tremendous "game-changing" GHG benefits of ethanol-blended fuels can be realized in the real world. [EPA-HQ-OAR-2010-0799-9505-A1, p. 8]

Another major factor with respect to vehicle costs for EVs, PHEVs, and FCVs are the durability of batteries and fuel-cells. Most analyses of EVs, PHEVs, and FCVS, including that associated with CARB's recent rulemaking (which used the same data that supports the NPRM) are based on two highly uncertain assumptions which are: [EPA-HQ-OAR-2010-0799-9505-A1, pp. 11-12]

1. The useful lives of EVs, PHEVs, and FCVs will be the same as conventional vehicles in terms of miles travelled; and

2. Vehicle owners will not have to replace batteries or major fuel cell system components over the course of a vehicle's useful life. [EPA-HQ-OAR-2010-0799-9505-A1, p. 12]

Obviously if either shorter vehicle life or the need to incur replacement costs for batteries or fuel cell systems occurs, the costs associated with EV, PHEV and FCV will be even higher than described above making these vehicles even less likely to provide "game-changing" reductions in GHG emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 12]

In supporting the proposed credits for EVs and PHEVs, EPA notes that "…electricity is considerably cheaper, on a per mile basis, than gasoline." While that may be true at present for electricity from the existing electrical grid and generation mix, it is not at all clear that will be the case for the electricity produced "…from low- GHG emissions feedstocks or from fossil feedstocks with carbon capture and sequestration" that EPA makes clear will need to be used to power EVs and PHEVs in order for them to provide "game-changing" reductions in GHG emissions. Generation costs for electricity from low-GHG sources or fossil-fired sources with carbon sequestration may be far higher than current generation costs and need to be carefully considered by EPA to the extent that decisions to provide incentives to EVs and PHEVs are based on the premise that electricity costs less than gasoline. Evidence that generation costs for low-GHG sources are likely to be higher than for existing plants can be seen, for example, in substantially higher capital cost estimates for those sources. Again, construction and operation of these low-GHG electricity sources are a necessary condition that must be met in order for EVs and PHEVs to provide “game-changing” reductions in GHG emissions. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 12-13]

The situation with respect to fuel costs for hydrogen is far less clear than for electricity. Hydrogen dispensed as a transportation fuel for use in FCVs is currently more expensive than gasoline and even in large scale wide spread production, the cost of low-GHG hydrogen is going to be considerably higher than that of central steam reforming of natural gas. Therefore, there will likely be substantial cost premiums associated with low GHG hydrogen that will have to be paid in order for FCVs to provide “game-changing” reductions in GHG emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 13]

In order to put the fuel cost issues for EVs, PHEVs, and FCVs into perspective, the “Payback Calculator” developed by CARB for its recent rulemaking was used to estimate the prices at which fuel costs for EVs and FCVs would equal those for gasoline vehicles based on low and average gasoline price forecasts which range from about $3.10 to $4.10 from 2017 to 2025. Using this CARB spreadsheet and its optimistic assumptions regarding EV and FCV energy efficiency, the electricity price at which electric vehicle fuel costs equal those for gasoline ranges from about $0.36 to $0.45 per kilowatt-hour while the hydrogen price ranges from about $7.50 to $9.00 per kilogram. [EPA-HQ-OAR-2010-0799-9505-A1, p. 13]

Although these prices for electricity and hydrogen may seem high relative to current electricity prices and prices for hydrogen produced using steam methane reforming at centralized plants, it should be recalled that they have to be compared to the prices that will be associated with electricity from marginal new ultra-low GHG generation capacity that would not otherwise be built and hydrogen production using ultra-low GHG processes. Given this, it is not at all clear that when proper cost accounting is made for ultra-low GHG electricity and hydrogen production that EVs, PHEVs, and FCVs will provide any meaningful fuel costs savings relative to conventional vehicles which in turn will create yet another hurdle to their ever providing “game-changing” reductions in GHG emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 13]

Although it might seem that the situation would be similar with respect to the distribution of electricity for use by EVs and PHEVs, that is in fact not the case. First, there are direct costs associated with residential charging equipment (referred to as electric vehicle service equipment or EVSE) which EPA has estimated range from about $1,300 to $1,500 for equipment and installation labor over the 2017 to 2025 period with the lower end of the range applying in the later years. These costs must be added on top of the already large incremental purchase prices of EVs and PHEVs. [EPA-HQ-OAR-2010-0799-9505-A1, p. 14]

Next there is the possibility that additional costs will be incurred to develop public EV and PHEV recharging infrastructure. While it is not clear that this infrastructure will be necessary, CARB will be studying the need for it and may at some point mandate its construction, and EPA may have to follow suit in the remainder of the nation. Again, to the extent that public EV and PHEV recharging infrastructure does have to be constructed to improve the viability of these vehicles those costs will obviously also have to added to the ledger. [EPA-HQ-OAR-2010-0799-9505-A1, p. 14]

Another potentially substantial cost associated with the deployment of EVs and FCVs is the need to upgrade the existing electrical transmission and distribution system. This is a problem that is already facing California that will almost certainly have to be dealt with across the country before EVs and PHEVs could even be hoped to provide “game-changing” reductions in GHG emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 14]

FCVs face even more serious issues with respect to the development of refueling infrastructure. First, refueling stations will either have to be located in reasonably proximity to existing hydrogen production facilities and receive hydrogen by truck or pipeline or utilize expensive onsite hydrogen generation capability. In addition, there may be significant facility siting and permitting issues and concerns regarding the high pressures and special equipment required for FCV refueling. [EPA-HQ-OAR-2010-0799-9505-A1, p. 14]

Although EPA has not attempted to analyze the costs associated with the development of the hydrogen refueling infrastructure that will be required to support FCVs regardless of how the hydrogen they use is produced, CARB has performed an analysis that likely represents a “best case” scenario. This analysis includes numerous optimistic assumptions regarding hydrogen station costs as well and assumes both that stations can be carefully located using knowledge of where FCVs will be sold and in general 100% utilization rates for hydrogen refueling stations. Even with these very optimistic assumptions, the direct capital costs for refueling stations amount to about $1,700 per FCV over roughly the same period as the 2017 to 2025 period considered by EPA. Again, these costs have to be added on top of the already large incremental purchase costs for FCVs and must be incurred before it can even be hoped that FCVs will provide “game-changing” GHG reductions. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 14-15]

To summarize, EPA has proposed to provide incentives under the GHG regulation for EVs, PHEVs, and FCVs because according to EPA these vehicles have the potential to yield “game changing” reductions in GHG emissions. However, in order for those reductions to be realized the following things all have to occur:

1. The public (directly or indirectly) must be willing to pay substantially higher prices for these vehicles;

2. The public (directly or indirectly) must be willing to pay substantial costs in order to develop the infrastructure required to provide fuel to these vehicles;

3. The public must be willing (directly or indirectly) to pay the costs associated with low-GHG electricity and/or hydrogen, which are not likely to be substantially lower than the costs for petroleum based fuels. [EPA-HQ-OAR-2010-0799-9505-A1, p. 15]

Organization: Honeywell Transportation Systems

EPA and NHTSA have historically refrained from adopting prescriptive policies favoring technologies, instead aiming to implement regulations favoring innovation and preserving the ability of industry to develop new technologies while also encouraging enhancements to current technologies. The Council of Economic Advisors has strongly endorsed technology neutrality, making clear that "the difficulty in promoting technology adoption through subsidies and other tools lies in designing policies that are neutral across all alternative technologies. Weighting the size of a subsidy by the degree to which each technology reduces environmental and security concerns would help to ensure that the Government is not in the position of picking winners. [EPA-HQ-OAR-2010-0799-9474-A1, p.3]

The agencies have proposed various incentive programs. Incentives for electric drivetrains take the form of both credit multipliers and a focus on tank-to-wheel emissions rather than accounting for the full well-to-wheel emissions of those vehicles. [EPA-HQ-OAR-2010-0799-9474-A1, p.4]

Organization: Hyundai America Technical Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 173.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 23.]

For example, some OEMs are focusing resources on electric vehicles, and they are receiving credit multipliers for expanding that technology.

Organization: Institute for Policy Integrity, New York University School of Law

EPA Should Move Quickly Toward Fully Counting Upstream Emissions from Electric Vehicles [EPA-HQ-OAR-2010-0799-9480-A1, p. 11]

In the proposed rule, EPA continues its practice of incentivizing electric vehicle technology by treating such vehicles as producing zero emissions and by letting manufacturers apply a multiplier when counting electric vehicles in their fleet averages. Yet, as EPA knows, electric vehicles are not responsible for zero greenhouse gas emissions: electric vehicles run on energy from the electric grid, produced largely by carbon-emitting combustion. EPA's program in essence allows for a triple undercounting of greenhouse gas emissions—once by not accounting for emissions from electric cars, twice by counting electric cars more than once when averaging, and finally by allowing the credits to be traded to other manufacturers—and allowing for increases in greenhouse gas emissions at every step. Any form of subsidization of new technology should be neutral with respect to greenhouse gas emissions; it should definitely not contribute to their increase. Although it may be a valid policy goal to incentivize new technology, EPA should achieve this goal by providing grants and subsidies to manufacturers and scientists exploring all promising emission-reducing technologies. By giving inflated regulatory incentives to a certain type of technology rather than allowing manufacturers to find the most efficient and effective solution, EPA will disincentivize other forms of technology that may be more cost-effective at reducing greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 11-12]

Fortunately, EPA at least plans to limit these distorting credits starting with model year 2022, dropping the multiplier and capping the number of cars that can be counted as having zero emissions; any remaining electric vehicles will be assigned their net upstream emissions. The agency asks for comments on whether there should be an interim period where only half of upstream emissions are counted, whether any changes should be made to the current electric vehicle incentive program, and whether similar incentives should be extended to other specific technologies. For the reasons given above, EPA should either eliminate these incentives, or at least move as quickly as possible toward fully accounting for the upstream emissions of alternative fuel vehicles. [EPA-HQ-OAR-2010-0799-9480-A1, p. 12]

Organization: International Council on Clean Transportation (ICCT)

13. While the ICCT strongly supports development of electric and fuel cell vehicles, one of our core principles is that efficiency and greenhouse gas emission standards should be technology neutral. Default zero upstream electric and fuel cell vehicle credits and multipliers violate this principle and reduce the benefits from the rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

The provision will also give windfall credits to vehicles required by the CA ZEV mandate, reducing benefits from the rule without any additional advanced vehicle sales. Electric and fuel cell vehicle credits should at least be limited to vehicles that are additional to those required by the ZEV mandate. A proposed system that strikes a balance between providing appropriate incentives for advanced vehicles and maintaining the effectiveness of the standards is detailed in our comments. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 3-4]

13) Upstream Plug-in and Fuel Cell Vehicle Credits

The ICCT was founded around the Bellagio Principles37, set forth in 2001 by regulators from the largest car markets around the world to help guide the future of worldwide motor vehicle technology and transportation fuels. A key principle states: 'Policymakers must...base policies solely on performance compared to societal objectives, and not give special consideration to specific fuels, technologies, or vehicle types.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 25]

Technology-neutral standards have a number of advantages over policies that specifically target distinct technologies. Picking the right 'winners' is challenging, and the wrong choices may hinder technologies that could have had the greatest potential benefit over the long run. Technology-specific bonuses reduce transparency and at the same time introduce opportunities for windfall credits at the expense of alternative technology development, consumer cost savings, and GHG reductions. [EPA-HQ-OAR-2010-0799-9512-A1, p. 25]

EPA has proposed two electric vehicle (EV) technology-specific bonus credits:

1. A default GHG compliance value of zero g/mi for battery electric vehicles (BEVs), fuel cell electric vehicles (FCEVs), and the electric operation fraction of plug-in hybrid electric vehicles (PHEVs). [EPA-HQ-OAR-2010-0799-9512-A1, p. 25]

2. A system of multipliers that allows manufacturers to count EVs as more than one vehicle in manufacturers' compliance calculations during the 2017 to 2021 model years. [EPA-HQ-OAR-2010-0799-9512-A1, p. 25]

The ICCT strongly agrees with the need to commercialize BEVs, FCEVs and PHEVs. These technologies are key components needed to meet the ambitious 2050 GHG reduction targets necessary to avert the worst impacts of climate change.39 To promote these vehicles without violating the principle of technology neutrality, ICCT is proposing an alternative accounting method for EV upstream fuel cycle GHG emissions that strikes a balance between providing advanced vehicle credits and maintaining technology-neutral standards. We also propose eliminating or restricting the use of multipliers and eliminating windfall credits for vehicles that are required under the California ZEV mandate. This would appropriately reward benefits inherent to EV technology, while also encouraging a number of other technology options to further improve EV efficiency. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 25-26]

The NPRM estimates that the two credit types proposed in the rule would erode 80 to 110 million metric tons of benefits from the MY 2017-2025 GHG standards. Our detailed comments below describe the benefits of ICCT's proposed technology-neutral EV emissions accounting system, contrasting them with the large windfall credits and unfavorable cost/benefit ratios that would result from the currently proposed EV incentives. [EPA-HQ-OAR-2010-0799-9512-A1, p. 26]

Electric Vehicle Net Upstream Fuel Cycle GHG Emissions Accounting

There are a number of compelling reasons why the regulatory proposal should properly account for the EV fleet's upstream GHG emissions from grid electricity and/or hydrogen. First, such a system would achieve all of the benefits of a technology-neutral standard. As noted earlier, transparency would increase and windfall credits would be avoided. Windfall credits are discussed in further detail later. [EPA-HQ-OAR-2010-0799-9512-A1, p. 26]

In addition, full EV upstream net-GHG emissions accounting would incentivize efficiency improvements and fully legitimize, for EVs, the application of many important and desirable off-cycle incentives proposed by the US EPA. ICCT expects that EVs can earn low or zero g/mile compliance values (as shown in Table 4) both because of intrinsic advantages to electric drive technology and the ability to capitalize on other improvements such as:

• Inherent efficiency advantages over petroleum combustion engines

• Further efficiency improvements through lightweighting, aerodynamics, and low rolling resistance tires

• Displaced petroleum upstream emissions

• Reduced air conditioning GHG emissions through low Global Warming Potential (GWP) refrigerants, low-leak technologies and/or improved AC system efficiency

• Other off-cycle credits, when justified [EPA-HQ-OAR-2010-0799-9512-A1, p. 26]

We recommend that the net EV emissions be calculated in the same way as the example for BEVs provided by US EPA, with the explicit addition of off-cycle credits: [EPA-HQ-OAR-2010-0799-9512-A1, pp. 26-27]

net upstream EV emissions = fuel carbon intensity x vehicle efficiency - off-cycle credits - displaced petroleum upstream emissions [EPA-HQ-OAR-2010-0799-9512-A1, p. 27]

EVs with specific technologies not reflected on FTP/HWFET test cycles, upon meeting specific criteria, would receive credit for displacing off-cycle internal combustion engine (ICE) GHG emissions. As opposed to giving credit for avoided BEV upstream emissions only (based on displaced upstream), this approach would not understate the overall BEV benefit compared to a conventional ICE. [EPA-HQ-OAR-2010-0799-9512-A1, p. 27]

In response to US EPA's request for comments on FCEV hydrogen carbon intensity, we recommend using California's expected carbon intensity values as a default at least until the mid-term review of the national GHG standards. California cumulative FCEV deployments are expected to reach more than 50,000 by 201742 and California is currently establishing hydrogen stations through the use of incentives and regulations.43 We encourage US EPA to establish an initial California transportation hydrogen carbon intensity placeholder value based on 67% steam methane reformer (SMR) hydrogen production (a widespread method of production in the United States today) and 33% hydrogen production from renewable resources. This would be reflective of California's approach and could be updated over time as FCEVs spread to other states. [EPA-HQ-OAR-2010-0799-9512-A1, p. 27]

We encourage US EPA to model regional variations in grid electricity carbon intensity, as suggested in the NPRM. Potential reductions in grid carbon intensity, changing over time due to mandatory state renewables or other carbon-reduction standards, should be accounted for as well. In the meantime, California has conducted extensive analysis estimating electricity carbon intensity for 2020, including imported electricity, which could be used for a substantial portion of US BEV and PHEV placements. As this information is currently available, US EPA could establish an interim California value of270 g/kw-hr44 along with a parallel aggregate value for the remaining 49 states. We agree with US EPA's proposed inclusion of transmission and distribution losses, as well as upstream fossil fuel production emissions. [EPA-HQ-OAR-2010-0799-9512-A1, p. 27]

Table 4 provides an example of the ICCT's recommended emission calculations, using a 2020 BEV fueled by projected California or US average 2020 electricity. We would encourage US EPA to determine a similar example with a 49-state electricity carbon value.45 This example is not intended to predict future vehicle emissions, but rather to illustrate the methodology explained above and show the potential for 'earned zero' net g GHG/mile ZEV compliance values. [Table 4 can be found on p. 28 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, pp. 27-28]

Windfall Credits for Mandatory ZEV Deployments and Lost Benefits

We agree with the importance of EV technology deployment. However, we emphasize that EV credits should be earned based on performance, rather than awarded, independent of performance, for the production of a certain vehicle type. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 28-29]

The ICCT has two significant issues related to (a) the proposed EV multipliers (also referred to as 'supercredits') and (b) the concept of giving vehicles a default zero gram per mile compliance score:

1. Large windfall credits for mandatory ZEV deployments.

2. High costs in terms of lost consumer savings and GHG benefits, even for vehicle deployments beyond mandatory levels. [EPA-HQ-OAR-2010-0799-9512-A1, p. 29]

Incentive programs are normally structured to avoid rewarding activity that is already otherwise required.47 The NPRM itself cites this principle, noting in the discussion of off-cycle credits that 'EPA would not provide credits for a technology required to be used by Federal law, such as tire pressure monitoring systems, as EPA would consider such credits to be windfall credits (Le. not generated as a results of the rule),'48 We agree with this principle, and in these comments we discuss how it can be applied to EV incentives. [EPA-HQ-OAR-2010-0799-9512-A1, p. 29]

The California Air Resources Board and Section 177 states have adopted the Zero Emission Vehicle program, requiring that manufacturers deploy large numbers of EVs.49CARB has forecast vehicle deployments out to 2025, although in terms of vehicle numbers the deployments are not specific regulatory targets due to flexibilities included in the ZEV rule. US EPA projections imply that for model years 2017 through 2025, deployments of BEVs and FCEVs mandated under California's ZEV rule are likely to account for 85 to 90+% of such vehicles nationally, whereas CARB forecasts show that PHEV deployments would be much higher than the US EPA's projection, as shown below in Table 5. Thus the vast majority of 'supercredits' generated under the proposed multipliers would likely be awarded to vehicles that manufacturers will be required to build even in the absence of the incentive. Furthermore, the total allocation of windfall credits seems likely to exceed the high-end scenario considered by US EPA in determining potential emission detriments stemming from the multiplier. [Table 5 can be found on p. 30 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 29]

While manufacturers receive benefit from bonus GHG credits, as noted below, ICCT finds that the societal costs of 'supercredit' multipliers and related default zero g/mi compliance values would be significantly greater than any potential incentive to manufacturers. Excess GHG credits allow manufacturers to decrease fuel efficiency across non-EVs in the fleet, and the resulting increase in overall fuel consumption and expenditures is the main factor responsible for this result,52 [EPA-HQ-OAR-2010-0799-9512-A1, p. 30]

Higher fleetwide fuel consumption along with related costs are shown in Table 6 below. Increased petroleum fuel costs range from $17,200 in MY2017 to $9,400 in MY2021 (in 2009$) at a 3 percent discount rate per EV from the proposed excess credits. We also estimate that fleetwide CO_2 would increase significantly per incremental EV due to the excess credits. Results for PHEVs would be scaled down based on different multipliers and the electric fraction of mileage. [Table 6 can be found on p. 31 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 30]

Table 7 shows two potential scenarios for the magnitude of the potential incentive manufacturers would see from the multiplier and zero upstream credits. ICCT selected scenarios of $25 and $35 per g CO_2/mi for illustrative purposes in Table 7 to represent a range of estimates of the potential marginal cost to move below 2020 emission levels for a midsized vehicle.57 As noted in several of our earlier comments, we believe that technology development will tend to result in lower costs than these estimates, reducing the potential value of bonus credits to manufacturers. ICCT used assumptions from NHTSA to calculate the reduction in a manufacturer's sales price for less efficient vehicles, which would reduce the net value of a GHG credit to a manufacturer.58 [Table 7 can be found on p. 33 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, pp. 31-32]

In all of these cost scenarios, the societal cost of the proposed EV incentives (as shown in Table 6) is significantly higher than the net benefit incentivizing the manufacturer (as shown in Table 7). We also note that the net manufacturer cost savings in these scenarios is less than the incremental cost of producing a BEV or FCEV in 2020, which is estimated by ARB to be $12,400-$12,900.59 The magnitude and uncertainty of this benefit is such that the EV bonus credits are unlikely to be effective in the absence of other types of consumer benefits, incentive programs, or manufacturer priorities. [Tables 6 and 7 can be found on pp. 31 and 33 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 32]

We also find that the system proposed in the NPRM could create confusion in the minds of consumers by creating a linkage between EV purchases and increased overall GHG emissions. Surveys show that drivers in the US, Canada, and 11 other countries overwhelmingly would want to know the source of electricity for a plug-in vehicle, and in the US 43% of respondents said that the source of electricity would affect their decision of whether to purchase the vehicle or not.60 While drivers were not directly asked whether indirect CO_2 increases linked to an EV purchase would discourage them from buying an EV this could be an unintended side-effect of these bonus credits. [EPA-HQ-OAR-2010-0799-9512-A1, p. 32]

Alternative Recommendation

If US EPA chooses not to eliminate MY2017-2021 multipliers and does not require EV fuel cycle net GHG upstream accounting, we would strongly encourage two modifications to the NPRM. First, EV incentives should be eliminated for all mandated vehicles. Direct coordination with CARB and Section 177 states would be the preferred approach, or an acceptable alternative would be to set a corresponding minimum deployment floor below which vehicles would not qualify for the incentives. Table 8 shows a potential scenario of ZEV and PHEV sales in California and Section 177 states as a percentage of national passenger vehicle sales, by model year. [Table 8 can be found on p. 34 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, pp. 33-34]

In addition, we would also recommend setting ambitious performance requirements to restrict eligibility for multipliers to the top performers. Real world range is a key determinant of environmental impact (due to gasoline vehicle miles displaced) as well as consumer acceptance, and could be used to establish performance criteria for each of the multiplier ratios that US EPA is considering. An example of this concept is shown in Table 9.64 [Table 9 can be found on p. 34 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 34]

Finally we would also encourage US EPA to add a cap on incentives offered for MY 2017MY2021, and to generally set these caps for those model years as low as possible. In the proposed rule, the lack of a cap for MY 2017-2021 leaves open the possibility of significant foregone emission reductions in the event that electric vehicle sales greatly exceed US EPA's expectations. If such high sales levels occur, then presumably the technology is succeeding beyond expectations and the incentive is either unnecessary or excessive. We recommend establishing caps, with eligibility on a 'first come-first served' basis, even if US EPA initially gives each manufacturer credit eligibility for a minimum number of vehicles in order to encourage broader adoption of EV technology. [EPA-HQ-OAR-2010-0799-9512-A1, p. 35]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 197.]

One of ICCT's guiding principles is that standards should be technology neutral. The proposed provisions to assign zero carbon emissions to electric-only operation and for artificial credits for certain pickup truck technologies distort the compliance system and reduce the overall benefits of the program.

---

37 Bellagio Memorandum on Motor Vehicle Policy, Principles for Vehicles and Fuels in Response to Global Environmental and Health Imperatives, Consensus Document: 19-21 June, 2001, Bellagio, Italy

39 See for example California Air Resources Board. 2011 Staff Report: Initial Statement of Reasons, Advanced Clean Cars, 2012 Proposed Amendments to the California Zero Emission Vehicle Program Regulations; Vehicles.' (ZEV ISOR)

42 Source: CARB. 2011. Initial Statement of Reasons, Advanced Clean Cars 2012 Proposed Amendments to the Clean Fuels Outlet Regulation. (CFO ISOR) November. p12. Available at http://www.arb.ca.gov/regact/2012/cf02012/cfoisor.pdf. last accessed 2-6-2012. Note that factors

such as transportation hydrogen station infrastructure deployment and the Zero Emission Vehicle regulation will favor FCEV deployments in California initially.

43 CARB. 2011. Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the 'LEV III Amendments' (LEV III ISOR) etc. p 136. CARB expects that California's 33% renewable transportation hydrogen requirement (California Senate Bill 1505 of2006) will be effective in the 2017-2025 timeframe

44 CARB LEV III ISOR. 2011. p136

45 us EPA us EPA Draft Regulatory Impact Analysis: Proposed Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse gas Emission Standards and Corporate Average Fuel Economy Standards (DRIA) RIA p4-31 and 4-32 and Federal Register Volume 76, Number 231, '2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; Proposed Rule', p75014.

47 See for example the California Carl Moyer Memorial Air Quality Standards Attainment Program, which 'provides incentive grants for c1eaner-than-required engines, equipment and other sources of pollution providing early or extra emission reductions'. (emphasis added)

49 Currently, there are 10 states which have adopted the California ZEV regulation: Connecticut, Maine, Maryland, Massachusetts. New Jersey. New Mexico, New York, Oregon. Rhode Island, and Vermont CARB, 2011. ZEV ISOR.BEVs and FCEVs are mandatory, and PHEVs can be used to partially satisfy the mandate.

52 The zero g/mi compliance value and related multipliers applied to ZEVs allow a de facto increase in the fleet average GHG standard that must be met by the conventional (non-ZEV) portion of the fleet. Thus each ZEV deployed results in a small increase in allowable emissions from the remainder of the fleet, and a related small decrease in mandated fuel economy.

57 As a first-order approximation, ICCT estimated an average cost of $29 per g/mile for midsize car technology packages. excluding AC reduction, to reduce emissions from the level of the 2020 standard. Technology package costs are from the CARB LEV IlIlS0R p124. LEV IlI1S0R technology costs generally listed in 2009 dollars, see for instance ES-12. Some packages would cost more while others less.

59 CARB. 2011. ZEV ISOR, p. 62.

60 Accenture. 2011. 'Plug-in electric vehicles: Changing perceptions, hedging bets'. http:jjwww.accenture.comjus-enjPagesjinsight-plug-in-electric-vehicles-changing-perceptions-summary.aspx last accessed 10-13-2011. pp. 5, 17. 1,000 of 7,000 surveys were conducted in the US, 500 in Canada, and 3,502 in Europe.

64 1.45 and 1.5 multiplier categories merged for simplicity. Note that while this suggested table would not provide an additional timing incentive, early deployments would generally receive

greater credits through a more favorable credit due to the higher level of the standards in earlier years.

Organization: Jackson, F.W.

Comments:

1. Impressive claims appear based on 'faulty' EPA analyses, see references 2 & 3. Ref 2 page 4 - 32 claim in error. Claims Leaf CO_2/mile at 161 g/mile by using average grams CO_2 per Kw-hr (0.632) but this is a marginal problem and has to use marginal analyses which as documented in ref 1 table 3-15 & 3-16 calcs to 1.267 gCO_2/added (marginal) Kw-hr. So using the correct marginal rate the Leaf g CO_2/mile would be 323 g CO_2/mile. This should be immediately corrected by EPA in their documentation, to not do so raises the question: where else in EPA's documentations are they using incorrect analyses & assumptions & methods & credits & multipliers to promote a more favorable, albeit incorrect, number. And using the official label's 0.34 Kw-hrs per mile yields 431 g CO_2/mL [EPA-HQ-OAR-2010-0799-8041-A1, p. 1]

2. Additionally, the claimed (Ref. 2 on page 4 - 32) for the Leaf of 0.34 Kw-hrs/mile, or at 3412 btu/Kw-hr yields 1160 btu/mile electrical energy to plug, or at 115,000 btu per gallon gasoline makes vehicle mpgge (miles per gallon of gasoline equivalent) at 99 mpgge. However, with overnight coal generating & distribution & conversion net efficiency at 28% coal fossil fuel to plug Kw-hrs reality is system fossil fuel mpgge is at 28 mpgge. While vehicle performance is interesting to make the vehicle go it has to have the fuel, thus information on all it takes to make the vehicle go a mile has to be counted, Le., moving the Leaf a mile using overnight coal generated Kw-hrs calcs to 28 mpgge fossil fuel (not 99 mpgge) and produces CO_2 emissions of 431 g/mile (not 161)! And at significantly more cost per vehicle mile, so why is Govt promoting these expensive to Nation poor system performance vehicles? [EPA-HQ-OAR-2010-0799-8041-A1, p. 1]

'Faulty' PHEV & BEV & corn ethanol Promotional analyses often used by others corrected for in my data: [EPA-HQ-OAR-2010-0799-8041-A1, p. 5]

1. Failure to assess all results at National and Consumer/Taxpayer level (all consequences of action including taxes & inflation & credits & multipliers & passthroughs impact; all important measures)

2. Use of average vs. reality (gCO_2 per overnight added/removed Kwhr)

3. pre-2017; classifying Plug-in miles as zero emissions, when they, at National system level, are not; and using elec miles to 'allow' vehicles with gas mpgg not meeting CAFE to be sold!

4. benign miles/Kwhr vs real world miles/Kwhr (environment cabin/battery conditioning/performance)

5. Need full & accurate upstream CO_2 & oil & E6Btu & $s & lifestyle accounting, use of current/future HEV upstream vs. CV upstream and some reduced upstream gasoline CO_2 & fuel could be nonUS

6. PHEV vs. CV instead of PHEV vs. HEV; obscures the Plug-in stand alone consequences

7. failure to show all consequences of CAFE credit (cost,CO_2,gasoline,E6Btu).

8. failure to evaluate all possible actions, e.g., Mid/Max *eft* ICE or HEV or PHEV or less ethanol, i.e., pick 'poor' competition and not look for most improvement for $:lifestyle, CO_2, gasoline, E6Btu

9. failure to account for Business/Govt pass throughs, i.e., inflation/taxes (I believe very significant, albeit not included in most of my above data). e.g., assuming for every consumer vehicle business+Govt also have some then the delta cost (all factors included) would be an increase to consumers/taxpayers. [EPA-HQ-OAR-2010-0799-8041-A1, p. 5]

Ref: 1. EPRI 'Environmental Assessment of Plug-In Hybrid Electric Vehicles Volume 2' United States Air Quality Analysis July 2007 - see Table 3-10 for MWh and Table 3-15 for CO_2 ton

2. EPA Draft Regulatory Impact Analysis 'Proposed Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards' EPA-420-D-11-004 November 2011

3. EPA Draft Joint Technical Support Document 'Proposed Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards' EPA-420-D-11-901 November 2011

Organization: Johnson Controls, Inc.

Standards must be technology-neutral and performance-based. Johnson Controls believes that, in some ways, this proposal inadvertently imposes 'preferred technologies' and, in so doing, does not consider the full range of technologies available to allow for a fully competitive marketplace. [NHTSA-2010-0131-0253-A1, p. 3]

Organization: Magna E-Car Systems

Magna E-Car Systems is engaged in the supply and manufacture of high quality components and systems for hybrid and electric vehicles. We at Magna E-Car Systems view our work as central to the innovation that automakers will require to reach the 54.5 mpg fuel economy standard proposed by the EPA and NHTSA. But more importantly, we view hybrid and electric vehicle technology as imperative to the continued growth and reinvention of the automotive industry in the United States.[EPA-HQ-OAR-2010-0799-9263-A1, p. 1]

Hybrid and electric vehicles will help automotive manufacturers reach their 54.5 mpg target for their corporate average fuel economy. That's good news for the American economy and workers. Already, Magna E-Car Systems manufacture these technologies at our new hybrid and electric vehicle development facility in Holly, Michigan. Magna E-Car Systems alone employs over 300 employees in Michigan. [EPA-HQ-OAR-2010-0799-9263-A1, pp. 1-2]

Organization: Marz, Loren C.

However, I do not support the 'Incentives for Electric Vehicles, Plug-in Hybrid Electric Vehicles, and Fuel Cell Vehicles' unless diesel technology is also included in some fashion. [NHTSA-2010-0131-0213-A1, p.1]

Another National Academies report concluded...

'...Electric vehicles and grid-dependent (plug-in) hybrid vehicles showed somewhat higher nonclimate damages than many other technologies for both 2005 and 2030. Operating these vehicles produces few or no emissions, but producing the electricity to power them currently relies heavily on fossil fuels; also, energy used in creating the battery and electric motor adds up to 20 percent to the manufacturing part of life-cycle damages....' [NHTSA-2010-0131-0213-A1, p.7]

Source: National Academies, 'Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use.'

This is supported by GREET1_2011 which shows that WTW emissions of particulate matter (PM) are higher for EV, PHEV, and FCV technology, all of which are proposed to receive special incentives under the proposed rule, than 'clean diesel' technology. Based on the default 'mid-sized' car assumed in GREET for the year 2020... [NHTSA-2010-0131-0213-A1, p.7]

WTW PM_{10} (diesel) = 0.009 (Feedstock) + 0.013 (Fuel) + 0.030 (Vehicle Operation) = 0.052 g/mi

WTW PM_{10} (EV) = 0.355 (Feedstock) + 0.017 (Fuel) + 0.021 (Vehicle Operations) = 0.393 g/mi

WTW PM_{10} (FCV) = 0.001 (Feedstock) + 0.059 (Fuel) + 0.021 (Vehicle Operations) = 0.081 g/mi

WTW $PM_{2.5}$ (diesel) = 0.005 (Feedstock) + 0.007 (Fuel) + 0.016 (Vehicle Operations) = 0.028 g/mi

WTW $PM_{2.5}$ (EV) = 0.089 (Feedstock) + 0.009 (Fuel) + 0.007 (Vehicle Operations) = 0.119 g/mi

WTW $PM_{2.5}$ (FCV) = 0.001 (Feedstock) + 0.031 (Fuel) + 0.007 (Vehicle Operations) = 0.039 g/mi

All of these values are based on the U.S. electric generation mix assumed in GREET in 2020. These values are graphically depicted more or less in a presentation of a previous version of GREET at http://www.iom.edu/~/media/Files/Activity%20Files/Environment/EnvironmentalHealthRT/WangGREETPresentationtoInstituteofMedicine1107REVISED.ashx - slides 24-25. [NHTSA-2010-0131-0213-A1, p.8]

Vehicle assumptions in GREET1_2011...

Diesel = 120% mpgge of baseline gasoline car

EV = 375% mpgge of baseline gasoline car

FCV = 237% mpgge of baseline gasoline car

Exhaust PM from the diesel car = 0.009 g/mi (PM_{10}); 0.0084 g/mi ($PM_{2.5}$).

Based on certified emissions of the 1996 VW Passat TDI (example of an 'old tech' diesel car), exhaust PM emissions = 0.06 g/mi (http://www.arb.ca.gov/msprog/onroad/cert/pcldtmdv/1996/volkswagen_pc_a0070189_1d9_1_diesel.pdf). [NHTSA-2010-0131-0213-A1, p.8]

0.06 - 0.009 = 0.051 g/mi more exhaust PM for the 'old tech' diesel than that assumed for 'clean diesel' in GREET.

0.052 g/mi + 0.051 g/mi = 0.103 g/mi WTW PM_{10} for the 'old tech' diesel car, still far less than 0.393 g/mi WTW PM_{10}, and significantly less than the WTW $PM_{2.5}$ from EV even assuming all PM from 'old tech' diesel exhaust is $PM_{2.5}$ (0.079 g/mi vs. 0.119 g/mi). [NHTSA-2010-0131-0213-A1, p.8]

'Old tech' diesel vehicles have been effectively banned for many years under Tier 2/LEV II regulations, to EPA's and CARB's credit, yet special incentives are being proposed for vehicle technology (e.g., EV) which may actually increase PM emissions from a WTW perspective above 'old tech' diesel engine technology. EPA acknowledges in the Draft RIA for this proposed rule that all $PM_{2.5}$ is treated as equally potent in causing premature mortality regardless of source (page 6-35 of the Draft RIA), even specifically mentioning $PM_{2.5}$ from diesel engine sources. So there appears to be no valid reason from a public health perspective to displace the reduction in $PM_{2.5}$ emissions from diesel engines with increased $PM_{2.5}$ emissions from power plants to support EV/PHEV/FCV technology. The regulatory push for these 'advanced technologies' defies logic from an emissions perspective. [NHTSA-2010-0131-0213-A1, pp.8-9]

It should also be noted that WTW SO_x emissions would also be higher for EV/PHEV/FCV, as would WTW NO_x emissions for EV/PHEV, than the default diesel car, according to GREET. [NHTSA-2010-0131-0213-A1, p.9]

A massive shift to EV/PHEV/FCV technology could risk offsetting gains made by EPA from diesel PM emission reduction mandates, more than offsetting it in the case of EV, and potentially reverse downward trends in the National Emission Inventory of PM_{10} and $PM_{2.5}$ emissions recently highlighted by EPA. Based on this analysis, a massive shift to these 'advanced technologies' would not only not be desirable, it may actually be environmentally detrimental, and incentives for these technologies are dubious. [NHTSA-2010-0131-0213-A1, p.9]

Organization: Mercedes-Benz USA, LLC

DAG endorses many aspects of the proposal, including in particular the agencies incentivizing advanced technologies such as electric and fuel cell drivetrains and off-cycle technologies. [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

DAG's future products will incorporate all aspects of advanced technologies. DAG will offer in the United States electric vehicles, plug-in hybrid vehicles, hybrid vehicles, fuel cell vehicles and potentially dedicated CNG vehicles as well. [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

• DAG strongly endorses the incentives for electric and fuel cell vehicles. Fuel cell vehicles, in particular, offer considerable long term advantages, and yet enjoy less short term public and private financial support than electric recharging infrastructure. The agencies should ensure that fuel cell vehicles remain a feasible option in the future by increasing the multiplier for fuel cell vehicles to 4. In addition, the agencies should provide a multiplier of 3 to dedicated CNG vehicles in light of the barriers these vehicles face and the significant role they can play in the fleet. [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

DAG strongly endorses the proposed incentives for battery-powered vehicles. The potential for battery technology in the United States and throughout the world remains strong, with a hesitant consumer market beginning to consider advanced technology vehicles. The four major market hurdles for battery-powered vehicles are: (l) public perception of electric vehicles as having limited range and functionality; (2) attacks based on upstream emissions pending change in the electricity supply towards renewable energy sources; (3) battery costs; and (4) limited infrastructure. EPA's conclusion that the market requires support to grow consumer confidence, build the refueling and servicing infrastructure and reduce battery costs recognizes the difficulties of building and sustaining support for 'game-changing' technologies with transformational long-term potential. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-5]

The concept of providing breathing room within a regulation to help nascent technology overcome short-term barriers is not novel.[9] EPA, for example, granted waivers through a relaxation of the NO_x standards in the 1980s in order to encourage diesel vehicles, and diesel sales soared. DAG's diesel sales during that period were substantial. More recently DAG introduced diesel BlueTEC technology to the United States. Other manufacturers have also introduced diesel passenger vehicles to the U.S. market. Public demand for clean diesel vehicles is growing.[10] The electric vehicle segment is particularly well-suited to such support. The credits associated with each type of battery technology should reflect the technology's potential to eliminate fossil fuel dependence and the level of the barriers that must be overcome for the technology to gain a strong foothold in the consumer marketplace. Thus, EPA has proposed that the credit multiplier for plug-in hybrids be somewhat less than the credit multiplier for full battery electric vehicles. Plug-in hybrids, while certain to playa significant role in building public confidence in electric vehicles, continue to have some limited ability to emit greenhouse gases. Full battery electric vehicles require a slightly higher incentive because they emit no greenhouse gases but will require more infrastructure and further technological advancement and more public experience to overcome initial skepticism. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-5]

Fuel cell vehicles are at the ultimate end of the spectrum. Fuel cell vehicles are able to support full functionality and dispense with range anxiety. They supply emissions free urban transportation as well as the capacity for long distance and interurban driving. Fuel cell vehicles can support a wide range of renewable fuels to generate hydrogen and electricity. Advances in battery technology will have a synergistic effect, because they will promote fuel cell batteries, as well as BEYs and PHEYs. DAG believes that with supporting government incentives, economies of scale, and advances in module strategies, fuel cell technology can be made cost competitive with diesel-hybrid vehicles. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-6]

Support for fuel cell infrastructure in the United States, however, lags behind that for electric vehicles. To be sure, California has moved towards revamping the Clean Fuels Outlet to promote fuel cell refueling stations.[11] The CFO proposal, however, links infrastructure support to the volume of fuel cell vehicles in California. Production incentives are therefore especially important to sustain the California effort and to ensure that a fuel cell market begins to take root and can ultimately grow in California and then spread throughout the United States. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-6]

Accordingly, DAG urges EPA to expand the credit multiplier applicable to fuel cell vehicles from 2.0 to 4.0. While PHEYs and BEYs are important, fuel cell technology represents the best opportunity over the long term to transform the personal transportation system entirely, to eliminate tailpipe greenhouse gas emissions and to service the full range of functionality and range demanded in the U.S. market. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-6]

---

9 EPA has long supported advanced diesel technology. While diesel engines expand fuel economy range over gasoline engines, they suffer from the carbon penalty when applied in the GHG program. This creates an inherent inconsistency between the CAFE and the GHG programs. A product with growing public support and the capacity to enhance fuel efficiency, reduce dependence on foreign oil and promote the economy provides a substantial compliance benefit in CAFE but goes largely unrecognized in the GHG program. This fundamental inconsistency creates a public policy disconnect with Europe and penalizes companies, such as DAG, that invested substantially in developing advanced diesel technology for the world market as well as the additional technology necessary to meet U.S. requirements.

10 Indeed, DAG has found that consumer prefer advanced diesel engines to hybrid vehicles with comparable fuel economy performance, at least as applied to DAG's luxury car offerings.

11 A nationwide effort is also underway in Germany to create a refueling network to support fuel cell vehicles.

Organization: Minnesota Department of Commerce

The proposed rule provides Electric vehicles (EVs) with preferential treatment compared with conventional or alternative fuel vehicles by means of a "credit" mechanism. The "credit" system proposed in the rule does not use life cycle assessment (LCA) methods commonly used for evaluating greenhouse gas emissions. Absent use of LCA, the proposed rule grants EVs zero greenhouse gas emissions even though U.S. DOE National Energy Technology Laboratory (NETL) studies show that electricity produced from fossil fuel may result in higher LCA vehicle emissions per mile than produced from gasoline (E10) hybrid electric vehicles. [EPA-HQ-OAR-2010-0799-7363-A1, p. 1]

Assure that the rule drives innovation so that diverse vehicle propulsion and fuel technologies can compete to achieve the goal. [EPA-HQ-OAR-2010-0799-7363-A1, p. 1]

Electric motors have no GHG emissions at point of use. A federal rule that only includes "tail pipe" –rather than life cycle emissions – effectively requires electric vehicles for the U.S. market. Rather than mandating a technology, the rule should motivate all propulsion and fuel technologies to compete to provide diverse, technical and economically optimal solutions for the Greenhouse Gas Emissions and Corporate Average Fuel Economy Standard. [EPA-HQ-OAR-2010-0799-7363-A1, p. 1]

Use LCA methodology for evaluating greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-7363-A1, p. 1]

Organization: Mitsubishi Motors R&D of America, Inc. (MRDA)

Supports the inclusion of an EV multiplier for MYs 2017 through 2021, and recommends that an EV multiplier be extended for MYs 2022 through 2025. [EPA-HQ-OAR-2010-0799-9507-A1, p.2]

Supports the 0 gram per mile compliance value for EVs, and the electric portion of PHEVs for MYs 2017 through 2021, and recommends that this compliance value continues in MYs 2022 through 2025. [EPA-HQ-OAR-2010-0799-9507-A1, p.2]

Mitsubishi Motors fully supports EPA's decision to provide an EV multiplier "to facilitate market penetration of the most advanced vehicle technologies as rapidly as possible". (76 FR 74878) This decision accurately reflects the current status of the EV industry relative to the U.S. market. During commercialization, an EV multiplier helps justify necessary capital investments to enable, deploy, and advance EV technologies before recouping these costs from vehicle sales. These capital investments are in addition to ongoing investments in traditional internal combustion engine technologies. As stated earlier, Mitsubishi Motors encourages the agencies to extend the EV multiplier in the later years of this rulemaking. Extending the multiplier will continue to make costs more reasonable and further promote EV technologies, allowing even greater GHG emission reductions to be realized. [EPA-HQ-OAR-2010-0799-9507-A1, p.4]

Mitsubishi Motors capital investments have led to global commercialization of the i-MiEV and to the development of quick charging technology. Specifically, we are a founding member of the CHAdeMO Association, a private industry association which aims to increase EV infrastructure worldwide and to internationally standardize the CHAdeMO protocol for DC quick charging of electric vehicles. As of February 2012, 1011 CHAdeMO quick chargers have been installed worldwide -- 835 in Japan and over 176 in Europe, Australia and North and South America. One of these quick chargers, certified for U.S. sale and public utility, was installed in our solar-powered charging station at our corporate headquarters in Cypress, California. [EPA-HQ-OAR-2010-0799-9507-A1, p.4]

Some of our continued and future capital investments are in the area of innovative charging techniques and energy storage management. Currently in Japan, Mitsubishi Motors is collaborating with wireless charger manufacturing and technology companies to develop EV charging systems enabled through electromagnetic induction. Mitsubishi Motors is also researching methods for capitalizing on i-MiEV batteries' storage capability for non-vehicle applications. Later this year, the Smart Grid Demonstration Project (the „V2X? concept) will begin at Mitsubishi Motors R&D headquarters in Okazaki, Japan. In the V2X project, electricity produced by solar panels will be stored in solar batteries, as well as i-MiEV batteries, and will be distributed to the factory power grid. All of these examples demonstrate our ongoing commitment and investment in EV vehicles and associated applications. An EV multiplier helps companies to sustain this type of research and investment before the establishment of a mass market for EVs. [EPA-HQ-OAR-2010-0799-9507-A1, pp.4-5]

Zero gram per mile compliance value [EPA-HQ-OAR-2010-0799-9507-A1, p.5]

Mitsubishi Motors fully supports EPA's decision to assign a zero gram per mile compliance value to EVs and the electric portion of PHEVs without company level caps for MYs 2017 through 2021. EPA's decision is sound public policy and recognizes that geography and regional economic factors determine the amount of renewable energy used to generate electricity. OEMs do not control these factors. Moreover, stationary source emissions are directly controlled by EPA under Title 5. Assigning power generation emissions to vehicles would lead to double counting – this is unprecedented and introduces an artificial burden on emerging technologies. Historically, fuel production ("well-to-tank") emissions were never assigned to the vehicle utilizing the fuel. Vehicle emissions are currently measured and regulated by the amount of compounds directly emitted by the vehicle. Given EVs and the electric portion of PHEVs do not emit CO_2, the proposed zero gram per mile compliance value is appropriate. [EPA-HQ-OAR-2010-0799-9507-A1, p.5]

The factors determining the amount of renewable energy used to generate electricity will not change. Therefore, the zero gram per mile compliance value as discussed above should remain in place for MYs 2022 through 2025. The regulatory cost of requiring the accounting of upstream emissions could create a barrier that would prevent manufacturers from producing and introducing newer, more efficient EVs and PHEVs. Furthermore, a company cap as proposed on the amount of vehicles that can use the zero gram per mile compliance factor is an unnecessary regulatory limitation, and we recommend that this requirement be removed. A cap could prevent a true and effective market penetration rate of these technologies. [EPA-HQ-OAR-2010-0799-9507-A1, p.5]

The EV multiplier compliance incentive is absolutely necessary to promote EV adoption during this rulemaking, and should be extended into the later part of this rulemaking. We support the zero gram per mile compliance value for EVs and the electric portion of PHEVs, which reflect the real-world GHG emissions at the vehicle level- a factor OEMs can control. Furthermore, this compliance value should continue into the later years of the rulemaking without limitations on usage. [EPA-HQ-OAR-2010-0799-9507-A1, p. 6]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 95-99.]

Automotive OEMs have little control over the source of electricity. Therefore, like was said before, they should not be subject to arbitrary emissions regulations on electric vehicles. These need to be accounted for in separate regulations of those regulated industries. And in absence of comprehensive national energy policy, Mitsubishi Motors recognizes the challenges and the associated risks of developing practical federal and fuel economy and greenhouse gas standards for light-duty vehicles. Mitsubishi Motors believes continued inclusive process to develop fuel economy and greenhouse gas standards is a realistic goal.

Organization: Motor & Equipment Manufacturers Association (MEMA)

Standards must be technology-neutral and performance-based. The proposed rule inadvertently imposes “preferred technologies” and, in so doing, does not consider the full range of technologies available to allow for a fully competitive marketplace. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

Fuel efficiency and GHG emissions standards must be technology-neutral and performance-based. Undoubtedly, the standards proposed by the agencies are well-intended and will continue to compel the automotive industry to reach these goals by incorporating a full range of technological innovations. No specific vehicle technology will meet all of our nation’s driving needs. All options must be made available in order to achieve the overall objectives to reduce fuel consumption and emissions. Despite the agencies’ assurances that they are not influencing the availability of certain vehicles, the proposal inadvertently influences “preferred vehicle technologies.” Thus, it constrains the full field of advanced technology vehicles that are available to meet the overarching fuel consumption and emissions reduction goals. A solution of today may not necessarily be the solution of tomorrow. Unintentionally driving technologies down a few narrow paths could possibly set us up for long-term failure to realize the nation’s goals. Moreover, such inadvertent preferences stifle technology innovation and constrain the competitive marketplace. [EPA-HQ-OAR-2010-0799-9478-A1, p.3]

Other potential consequences are non-market based imbalances and preferential treatment to certain vehicle manufacturers (depending on their use of “preferred technologies” in their fleet mix), ultimately picking "winners and losers." Restricting incentives to specific technologies could present a market where such vehicles are produced, but not purchased because these vehicles may not meet consumers' needs or value expectations. Again, this may result in less-than-needed fleet penetration in order to impact the emissions and fuel consumption and meet the goals of the Program. [EPA-HQ-OAR-2010-0799-9478-A1, p.3]

Benefits of these technologies should be considered from a well-to-wheel, fuel lifecycle perspective. Without this type of comprehensive assessment, the agencies consequently improperly favor preferred technologies rather than providing truly technology-neutral standards. MEMA would recommend using the existing well-to-wheel assessment of the GREET (Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation Model) that is used by the U.S. Department of Energy. GREET has been used to shape policy choices that impact emissions and evaluates the well-to-wheel impact of various technologies. [EPA-HQ-OAR-2010-0799-9478-A1, p.3]

In the NPRM, EPA discusses two alternatives for the calculation of CAFE for dual fuel vehicles for MY2020 and beyond after the expiration of the calculation currently in effect through MY2019 (as specified in 49 U.S.C. 32905). EPA has invited comment on both approaches. [EPA-HQ-OAR-2010-0799-9478-A1, p.12]

Organization: National Association of Clean Air Agencies (NACAA)

Third, we recognize that this program, proposed by EPA under section 202(a) of the Clean Air Act, is a vehicle tailpipe emissions control program. As such, it is appropriate to assign a tailpipe emissions level of 0 g/mile CO_2 for all electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs) and fuel cell vehicles (FCVs), as EPA does for MYs 2017 through 2021 with a per-company cumulative sales cap for 0 g/mile for MYs 2022 through 2025. [EPA-HQ-OAR-2010-0799-8084-A1, p. 4]

We are pleased that, as EPA states, this program's focus on vehicle tailpipe emissions does not raise issues relative to criteria pollutants because "upstream emissions [of criteria pollutants] associated with production and distribution of the fuel are addressed by comprehensive regulatory programs focused on the upstream sources of those emissions." In addition, we appreciate the agency's statement that because "upstream GHG emissions values are generally higher than the upstream GHG emissions values associated with gasoline vehicles, and because there is currently no national program in place to reduce GHG emissions from electric power plants, EPA believes it is appropriate to consider the incremental upstream GHG emissions associated with electricity production and distribution." But, we also believe it is an appropriate position to encourage the initial commercialization of EVs, PHEVs, and FCVs while monitoring the status of upstream emissions. [EPA-HQ-OAR-2010-0799-8084-A1, p. 4]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 36-37.]

Organization: National Corn Growers Association et al.

Only vehicle tailpipe emissions are counted toward compliance with GHG standards rather than including complete life cycle emissions, excluding emissions generated in the production and delivery of the fuel whether electricity, gasoline, natural gas or a renewable fuel such as ethanol. As a result, all types of electric vehicles would have “zero” emissions during electric operation when this is clearly not the case when electricity production emissions are included. This method unfairly advantages electrically fueled vehicles over other technologies, and does not allow for a comparison of true emission performance among various propulsion technologies and fuels. For example, a BEV generates no tailpipe emissions, but an FFV fueled with E85 might compare very favorably to the BEV if GHG emissions were evaluated on a life cycle basis[3] as they should be in evaluating their contribution to the air. By structuring credits to favor one technology over another, the agencies are picking winners and losers rather than allowing technologies to compete on a level playing field against a performance standard[4] . In addition, the fact that EPA chose tailpipe instead of life cycle emission standards for the CAFE/GHG rule is inconsistent with EISA and with RFS2 GHG performance threshold standards[5]. [EPA-HQ-OAR-2010-0799-9565-A1, p.3]

---

3 - “Well-to-Wheels Analysis of Advanced Fuel/Vehicle Systems — A North American Study of Energy Use, Greenhouse Gas Emissions, and Criteria Pollutant Emissions”, May 2005, Figure 4-5. [EPA-HQ-OAR-2010-0799-9565-A1, p.3]

4 - The favoring of EV technology over renewable fuels is especially evident in the specific denial of credits for FFVs in the proposed rule, Sec. III.C, p311. [EPA-HQ-OAR-2010-0799-9565-A1, p.3]

5 - “EISA required EPA to apply lifecycle greenhouse gas performance threshold standards to ensure that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces.” From http://www.epa.gov/otaq/fuels/renewablefuels/ [EPA-HQ-OAR-2010-0799-9565-A1, p.3]

Organization: National Propane Gas Association (NPGA)

Government Agency Consistency

The Department of Energy is currently seeking to adopt the recommendation of the National Academy of Sciences (NAS) that “DOE shift over time to use of a FFC measure of energy consumption for assessment of national and environmental impacts, particularly GHG for establishing appliance efficiencies.” In doing so, the NAS also recommended providing more comprehensive information to the public through labels and/or other means, such as an enhanced website. [EPA-HQ-OAR-2010-0799-9482-A1, p. 6]

NPGA believes any final rule reducing CAFE and GHG standards for light-duty vehicles for the years of 2017 through 2025 absent FFC measurement would easily provide automakers of advanced technology vehicles an unfair market advantage for their vehicles. Without FFC analysis, using electricity as the dedicated vehicle fuel gives the impression that its use in light-duty vehicles is 100 percent efficient with zero end-use emissions. This conclusion is erroneous and analogous to the DOE promulgating energy efficiency standards for building appliances finding no GHG emissions associated with turning on a light bulb. Further conveyance of this logic will have a compounding effect for any and every year the EPA/NHTSA carries it forward through the year 2025. [EPA-HQ-OAR-2010-0799-9482-A1, p. 6]

Rulemaking that focuses on point-of-use energy creates and maintains an unfair market advantage for technologies that already have lower full-fuel-cycle efficiency and higher GHG emissions. The overall FFC efficiency for electricity typically results in only about 30 percent of usable energy at the point-of-use. However, FFC analysis recognizes the efficiency of the autogas delivery process resulting in approximately 87% of the energy produced being delivered as usable energy. For these and other reasons, we propose that GHG emissions especially as they relate to emissions for electric vehicles, fuel cell vehicles, and the electric portion of plug-in hybrid electric vehicles be accounted for immediately upon the final rule's effective date. [EPA-HQ-OAR-2010-0799-9482-A1, p. 7]

Organization: National Wildlife Federation (NWF)

In principle, we also support incentives for plug-in hybrid electric and electric vehicle technology and for real off-cycle CO_2 reductions, and we look forward to continuing to work with automakers, the agencies and consumers to maximize the effectiveness of these credits and other measures which enable rapid adoption of new technology, and to optimize short and long term emissions impacts. [EPA-HQ-OAR-2010-0799-9887-A2, p. 4] [[This comment can also be found in Outline Headings 5. and 7.]]

Organization: Natural Resources Defense Council (NRDC)

EPA should include emissions associated with upstream electricity or hydrogen production for plug-in electric or hydrogen fuel cell vehicles in the emission scoring. If incentives remain that discount upstream emissions, the structure should be strengthened to ensure greater environmental certainty of the incentives and minimize losses of emission reduction benefits. [EPA-HQ-OAR-2010-0799-9472-A2, p. 3]

B. Program incentives

1. Treating Plug-in Electric and Hydrogen Fuel Cell Vehicles as "Zero" Emissions Undermines Pollution and Technology Benefits of Program

In the proposal, EPA acknowledges that awarding plug-in electric vehicles an emissions rate of 0 g/mi inaccurately reflects their real-world impact and reduces the potential GHG reductions of the program by up to 5.4 percent.34 Automakers can comply by producing advanced technology vehicles such as plug-in electric or hydrogen fuel cell vehicles which then allows them to apply less technology to their conventional vehicle fleet which, in turn, results in a higher average fleet emissions rate. To avoid this loss in emissions and fuel savings benefits, NRDC believes that the emissions associated with upstream electricity or hydrogen production should be included in the compliance scoring. [EPA-HQ-OAR-2010-0799-9472-A2, p. 11]

However, if the agencies proceed with their proposed 0 g/mi treatment, other incentives, such as off-cycle credits, should not be available for the portion of an advanced vehicle's driving range that is powered by grid electricity or off-board hydrogen. No vehicles should be allowed to have negative emissions. For plug-in hybrid electric vehicles, the benefit of additional incentives should be calculated based on the emissions or efficiency benefit achieved for only the gasoline or diesel operation of the vehicle. [EPA-HQ-OAR-2010-0799-9472-A2, p. 11]

NRDC believes EPA underestimates the potential losses in GHG reductions due to plug-in electric vehicles. The California Zero Emission Vehicle (ZEV) program, the latest version of which was recently authorized by the California Air Resources Board (CARB), is expect to encourage higher sales volumes nationally than those predicted by EPA. EPA estimates up to 2.8 million vehicles (plug-in electric and fuel cell vehicles) will be sold from 2017 to 2025. According to CARB, the ZEV program could result in 1.4 million sold in California during the same period.35 Additionally, CARB has estimated that the states which have adopted the ZEV program (under Section 177 of the Clean Air Act) could have electric vehicle sales that are twice the California level, or 2.8 million vehicles.36 It is also reasonable to assume that another 10 percent of vehicles would be sold in non-ZEV states as many automakers are focusing sales nationally or at least in some states in addition to 177 states. In total, national electric vehicle sales could be 4.6 million, or 65 percent greater than EPA's highest estimate. [EPA-HQ-OAR-2010-0799-9472-A2, p. 11]

To limit the loss of GHG benefits, EPA should modify the cap on the number of vehicles eligible for 0 g/mi treatment. NRDC recommends that EPA adopt an industry-wide cap following the structure described in the NPRM as the alternative to the proposed manufacturer-specific cap. NRDC recommends the industry-wide cap because it ensures the environmental benefits of the program. If set appropriately by considering the higher potential sales as described above, the industry-wide cap could ensure that no more than 5 percent of the program GHG reductions are lost. NRDC recommends that the industry-wide cap be set based on cumulative plug-in electric vehicles produced beginning in 2012 because even these early volumes will help pave the way for electric vehicle production cost reductions and greater market acceptance. While 0 g/mi treatment could be applied for model years 2017 to 2021, as EPA has proposed, the post 2021 cap of no more than 2 million vehicles would be lowered by the cumulative sales that occurred before 2022 to reflect the technology advancement in the early years of the program. [EPA-HQ-OAR-2010-0799-9472-A2, pp. 11-12]

If EPA maintains the manufacturer-specific cap, NRDC believes it should be lowered from the proposed 600,000 for each manufacturer that sells at least 300,000 from 2019-2021 to ensure that no more than 5 percent of the GHG reductions are lost when considering sales volumes in excess of 4 million vehicles from 2017-2025. [EPA-HQ-OAR-2010-0799-9472-A2, p. 12]

NRDC opposes any weakening or removal of the cap on 0 g/mi treatment that exists for model years 2012-2016. [EPA-HQ-OAR-2010-0799-9472-A2, p. 12]

NRDC supports the requirement of a minimum all-electric range of at least 10 miles for a vehicle to be eligible for 0 g/mi treatment. NRDC also agrees that the 0 g/mi treatment should only apply to operation on grid-supplied electricity in plug-in hybrid electric vehicles. The use of a utility factor is a reasonable allocation of the 0 g/mi treatment. [EPA-HQ-OAR-2010-0799-9472-A2, p. 12]

We also welcome further discussions with EPA on the details of setting upstream emissions accounting. EPA notes that there are several factors to consider including marginal versus average power plant emissions rates, regional variability and how to project emission rates for vehicles that are charging over many years. NRDC provided comments in the 2012-2016 GHG proposed rule along these lines and we recognize that on-going analysis could be appropriate to most accurately quantify electric vehicle emission rates for real-world operation. [EPA-HQ-OAR-2010-0799-9472-A2, p. 12]

---

35 CARB, Staff Report: Initial Statement Of Reasons, Advanced Clean Cars, 2012 Proposed Amendments To The California Zero Emission Vehicle Program Regulations, December 7, 2011. [EPA-HQ-OAR-2010-0799-9472-A2, p. 111]

36 Ibid [EPA-HQ-OAR-2010-0799-9472-A2, p. 13]

Organization: Nissan North America, Inc.

Support for Electric Vehicles: The proposal represents a significant leap forward in advancing environmentally friendly vehicles and zero emissions transportation. Battery electric technology has the ability, over time, to reduce substantially reliance on foreign oil and to provide vehicles capable of running on renewable energy sources. While automobile manufacturers cannot control the source of fuel, the industry can develop and market vehicles supporting clean energy use and can ensure that tailpipe emissions are diminished, or-as in the case of the Nissan LEAF-eliminated completely. [EPA-HQ-OAR-2010-0799-9471-A1, p.2]

Credit Multiplier: The proposed credit multiplier for battery electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs) and fuel cell vehicles (FCVs) is critical to the Widespread deployment of these advanced powertrain technologies. The adoption of these alternative powertrains, beyond their initial purchasers, hinges on significant investment by automobile manufacturers in research and development, the appropriate amount of time to create an effective deployment strategy, and marketing initiatives that are tailored to new technology deployment. Past experiences have shown that regulatory programs that support new technologies Increase the availability and rate of adoption of new technologies, making it more likely that new technologies reach a critical mass of consumers. [EPA-HQ-OAR-2010-0799-9471-A1, p.2]

Measuring Tailpipe Emissions: Nissan supports EPA's proposal to use a greenhouse gas emissions compliance value of 0 grams per mile for EVs, FCVs and the electric portions of PHEVs in MYs 20172021 (and certain vehicles in MYs 2022-2025). The compliance value of these vehicles should always be measured at zero grams per mile. Including upstream emissions in the compliance calculation will cause confusion in the marketplace and will detract from the agencies' support for the deployment of battery powered vehicles. The agency should, as a matter of public policy, continue to promote the advancement of zero and low-emission vehicles while separately focusing on the development of renewable and/or low emission power sources. This is not only the best policy decision to promote EV deployment and increase their rate of adoption, it is also legally required. [EPA-HQ-OAR-2010-0799-9471-A1, p.3]

While advancements in petroleum powered vehicles are essential to improving fuel efficiency and necessary to achieve immediate goals, battery electric technology offers the promise of yet more substantial reductions-and even the elimination-of tailpipe emissions. Nissan anticipates that battery electric and plug-in hybrid vehicles can achieve a significant market share if supported by government programs and incentives, and if the industry is provided with the necessary incentives to invest in the technology. [EPA-HQ-OAR-2010-0799-9471-A1, p.10]

Other automakers are also entering the market for battery electric vehicles and plug-in hybrids. Most, however, are doing so more cautiously than Nissan and continued investment will depend largely on the extent to which consumers adopt the technology and infrastructure is built to support the vehicles. As set forth in more detail below, government incentives and support are essential to ensuring manufacturer investment and widespread consumer adoption of these technologies. [EPA-HQ-OAR-2010-0799-9471-A1, p.10]

The credits proposed for electric drivetrains and the continued focus on tailpipe emissions when calculating GHG emissions are critical to promoting the government's long term policy initiatives. Without the incentives and continued focus on tailpipe emissions when calculating GHG emissions, as explained more fully below, consumers will be slower to adopt these advanced technologies and continue to rely on traditional internal combustion vehicles, which will result in higher overall greenhouse gas emissions long term. It is not until consumers adopt these technologies that the United States can realize the benefits of these transformational, 'game changing' vehicle technologies. [EPA-HQ-OAR-2010-0799-9471-A1, p.10]

As EPA recognizes, the proposed regulatory incentives for electric vehicles are 'justified by promoting technologies that have significant transportation GHG emissions and oil consumption game-changing potential in the longer run, and that also face major market barriers in entering a market that has been dominated by gasoline vehicle technology and infrastructure for over 100 years.' See 76 Fed. Reg. 74,854, 75,011 (Dec. 1, 2011) ('Proposed Rule'). Meaningful market penetration of these advanced powertrains hinges not only on increased consumer demand and continued infrastructure development, but also on significant investment by automobile manufacturers. [EPA-HQ-OAR-2010-0799-9471-A1, pp.10-11]

Automobile manufacturers face an increasingly competitive market, short-term economic uncertainties and increasing regulatory costs. Nissan and other automakers must invest in a range of technologies to provide certainty in their ability to meet the proposed standards. While Nissan remains committed to the promise of battery electric vehicles, the proposed incentives provide the requisite support to the industry as a whole to make the early investment required to create a more robust market for battery electric vehicles and to spur their adoption rate. [EPA-HQ-OAR-2010-0799-9471-A1, p.11]

In order for new a technology--especially technologies that disrupt the status quo-to be adopted on a meaningful scale, it is essential that the new technology be adopted by a critical mass of consumers. While some new technological innovations diffuse from first use to widespread adoption in a matter of years, others may level out at less than 2 percent. See generally Everett M. Rogers, Diffusion of Innovations 219 (Free Press 5th ed. 2003) (1962). [EPA-HQ-OAR-2010-0799-9471-A1, p.11]

A widely used depiction of the technology adoption curve is the 'Innovation Adoption Lifecycle' developed by Joe M. Bohlen, George M. Beal, and Everett M. Rogers at Iowa State University: [EPA-HQ-OAR-2010-0799-9471-A1, p.11] [For the graphic referenced (technology adoption curve) please refer to EPA-HQ-OAR-2010-0799-9471-A1, p.11]

See Diffusion of Innovations at 281.[6] As the bell curve shows, new technologies begin with a relatively small number of 'Innovators,' then move to 'Early Adopters' before possibly finding acceptance within the pragmatic majority of consumers. Most of the variance in the rate of adoption of innovations is explained by five attributes: relative advantage, compatibility, complexity, trialability, and observability. Jd. at 221. [EPA-HQ-OAR-2010-0799-9471-A1, pp.11-12]

As applied to many consumer markets, a disruptive technology is likely to displace more traditional technology as it moves along the adoption curve to reach the pragmatic majority of consumers. However, as applied to the motor vehicle market, the goal is not for electric drivetrains to displace ICE vehicles, but rather for electric vehicles to gain enough of a foothold in the marketplace to be able to share the market with more traditional drivetrain technology. [EPA-HQ-OAR-2010-0799-9471-A1, p.12]

A disruptive technology has the best chance of broader adoption when 'opinion leaders adopt, which usually occurs somewhere between 3 and 16 percent adoption in most systems.' Jd. at 223. The Early Adopters are the opinion leaders in communities, and potential adopters of a new technology look to them for advice and information. Jd. at 283. Consistent with this well-developed theory of technology adoption, the agency has recognized that 'consumer interest in EVs is likely to change over time, as early adopters share their experiences.' Proposed Rule at 75,117 (emphasis added). [EPA-HQ-OAR-2010-0799-9471-A1, p.12]

The Innovation Adoption Lifecycle represents what is necessary to enable EVs to move from Innovators to Early Adopters in order to gain enough of a foothold to, over time, find acceptance amongst early members of the more pragmatic majority. In this context, government production incentives are imperative to ensure that electric drivetrains are able to make the critical move from the approximate 2.5% of the market where Innovators are willing to experiment with the new technology to the next group of consumers where Early Adopters showcase the practical use of the technology and begin the process of incorporating the technology into the broader market. [EPA-HQ-OAR-2010-0799-9471-A1, p.12]

Since the motor vehicle market needs to be supported by substantial infrastructure and involves substantial investment and up-front costs, movement along the technology adoption curve is substantially slower and more precarious. Hybrids, for example, while gaining general acceptance as a viable drivetrain, have only just reached a consumer market share where they have transgressed beyond innovative consumers to more widespread early adopters. [EPA-HQ-OAR-2010-0799-9471-A1, p.13]

The chart on the following page depicts the rate of HEV sales from when they were first introduced in 1999 through 2007, and also depicts where EVs are on that same production schedule: [EPA-HQ-OAR-2010-0799-9471-A1, p.13] [To view the chart please refer to EPA-HQ-OAR-2010-0799-9471-A1, p.14]

The first hybrid Honda Insight was introduced in the U.S. in 1999 and the first Toyota Prius was introduced in the United States in 2000. HEVs comprised only about 0.5% of new car sales during the first generation of these vehicles; and, as of2004, only five HEV models were available. HEVs reached a key tipping point, increasing their U.S. light-duty vehicle market share by 250%, between 2004 and 2005 when multiple automobile manufacturers entered the market offering a variety of HEV models. This tipping point coincided with the second generation Prius. Yet, today hybrids have just reached a 2.5-3% market share. [EPA-HQ-OAR-2010-0799-9471-A1, p.14]

The hybrid experience represents the extreme challenges of introducing transformational drivetrain technology into the new motor vehicle fleet. EVs must not only travel the same early-stage adoption path as HEVs (which still rely on petroleum), but also face more substantial market barriers, such as concerns over range and the need to develop support infrastructure. As reflected on the graph, the EV market is only in its infancy. It will require substantial support to overcome the barriers to broad market penetration and to ensure a solid and long-lasting foothold in the automotive marketplace. [EPA-HQ-OAR-2010-0799-9471-A1, p.14]

The projected market penetration rates for EVs and PHEVs vary significantly, demonstrating the market uncertainty surrounding these technologies. The Boston Consulting Group projects that EVs and PHEVs could make up 2% of new light-duty vehicle sales in 2020. A study conducted by Google.org using McKinsey & Company’s Low Carbon Economics Tool, on the other hand, projects that EVs and PHEVs could make up as much as 70% of new light-duty vehicle sales by 2030. The Google Study projection assumes rapid decreases in battery costs and increases in energy density by 2030, to enable the production of electric vehicles with 300-mile range and a total cost of ownership lower than that of conventional gasoline vehicles. See Google Study at 12. Without a breakthrough in battery technology, however, the Google Study concludes that it will be 'much harder for EVs to reach scale.' Id. [EPA-HQ-OAR-2010-0799-9471-A1, pp.14-15]

The HEV experience and the EV market forecasts reflect the uncertainties surrounding the successful deployment of transformational drivetrain technologies beyond market innovators. 'Diffuser incentives'-incentives provided to manufacturers to produce a new technology and to persuade consumers to adopt that technology-will provide a strong foundation upon which to base that deployment and to redress the market barriers that may otherwise stall or limit a more expanded market for advanced vehicle technologies. The proposed production incentives are imperative for that technology adoption to occur. [EPA-HQ-OAR-2010-0799-9471-A1, p.15]

Indeed, compliance incentives historically have been successful in generating production and creating a market for new light-duty vehicles. When, for example, EPA provided an incentive for diesel vehicles in the 1980s through a relaxed NO_x standard, the production and sale of diesel vehicles rose considerably.[11] As evidenced in the graph below, diesel vehicles saw their best sales during those years. For the period during which the waivers were in effect, the percentage of new light-duty vehicle sales was approximately four times higher than it was in the immediately preceding years: [EPA-HQ-OAR-2010-0799-9471-A1, p.15] [To view the graph please refer to EPA-HQ-OAR-2010-0799-9471-A1, p.16]

The experience with light-duty diesel vehicles demonstrates the successful use of compliance incentives to generate the manufacture and marketing of advanced and innovative technology in the light-duty vehicle market.[13] [EPA-HQ-OAR-2010-0799-9471-A1, p.16]

The Proposed Incentives Will Encourage State and Local Governments and Private Firms to Stay the Course, and Continue to Promote Advanced Vehicle Technologies [EPA-HQ-OAR-2010-0799-9471-A1, p.16]

The successful development of an EV market depends upon the simultaneous growth of vehicle production, consumer demand and infrastructure. The proposed incentives offered to manufacturers will result in increased production and availability of EVs and PHEVs. They will complement an existing array of federal and state consumer incentives and public funds for infrastructure and charging[14] that have created a viable market in the key and early markets, and a budding consumer interest in additional markets throughout the nation. Private investment in EV infrastructure is being made as well[15], and utilities are offering time-of-use incentives which make owning and operating a battery electric vehicle easier.[16] [EPA-HQ-OAR-2010-0799-9471-A1, pp.16-17]

Public and private investment, however, remains uncertain as budget constraints present challenges to the federal, state and local governments. Private firms, moreover, must see strong government support for electric vehicles to justify investment in electric vehicle infrastructure. The proposed incentives will encourage state and local governments and private firms to stay the course, and continue to promote advanced vehicle technologies. [EPA-HQ-OAR-2010-0799-9471-A1, p.17]

The experience to date shows that the market will respond best with a combined support of incentives, infrastructure and vehicle availability. The deployment of the Nissan LEAF has been initiated in 'waves'. The waves reflect the markets that Nissan considered to be more market ready in terms of both consumer demand and local government support. The initial wave (Wave 1) began in late 2010 and included San Francisco, San Diego, Sacramento, Los Angeles, Honolulu, Portland, Seattle, Phoenix, Nashville, Dallas, Houston and Austin. The Nissan LEAF was introduced in other cities in additional waves throughout 2011. Nissan anticipates a nationwide rollout of the Nissan LEAF in 2012. [EPA-HQ-OAR-2010-0799-9471-A1, p.17]

Focusing on the Wave 1 markets where data is more readily available, Nissan has analyzed the factors necessary to convert general consumer interest in electric vehicles to the ultimate purchase of a Nissan LEAF. Consumer interest in the Nissan LEAF begins with 'Handraisers,' those who sign up (bye-mail or otherwise) to receive information about the Nissan LEAF. Handraisers can then take the next step and make a 'Reservation,' a refundable $99 deposit that will reserve the consumer's place in line when Nissan LEAFs are made available in the consumer's market. Once they are, the consumer can request a quote (RAQ) from a dealer. Ultimately, if the consumer decides to purchase the Nissan LEAF, this will lead to an order or sale (collectively 'Orders'). [EPA-HQ-OAR-2010-0799-9471-A1, p.17]

The Wave 1 markets demonstrate the importance of consumer incentives. Providing direct consumer benefits such as access to HOV lanes and financial support for home electric vehicle supply equipment (EVSE) installation significantly increase EV interest and sales. Data from Wave 1 of the Nissan LEAF shows that consumers eligible for the EV Project (a public-private partnership funded in part by the Department of Energy), through which they would receive residential EVSE installation at no cost, were twice as likely to purchase an EV as those who did not. Moreover, in states with one monetary consumer incentive, internal data shows that people were 216% more likely ultimately to order a Nissan LEAF. In states with two or more consumer incentives, data shows that people were 300% more likely ultimately to order a Nissan LEAF. [EPA-HQ-OAR-2010-0799-9471-A1, p.18]

Further, markets with more substantial installed and planned infrastructure exhibit a higher level of conversion from Reservations to Orders (35-40%) than those with less infrastructure (23-30%). The amount of infrastructure needed in the remaining markets, however, remains considerable and Nissan's data suggests that a combination of increased vehicle availability and growth in infrastructure will combine to increase demand for battery electric vehicles. [EPA-HQ-OAR-2010-0799-9471-A1, p.18]

In sum, the proposed incentives will complement an existing array of consumer incentives and infrastructure development to enable EVs to overcome near-term market barriers, resulting in an accelerated tipping point for EV adoption. [EPA-HQ-OAR-2010-0799-9471-A1, p.18]

Upstream Emissions Should Not be Considered When Calculating Greenhouse Gas Emission Compliance Values [EPA-HQ-OAR-2010-0799-9471-A1, p.18]

Nissan has long endorsed measuring the greenhouse gas emissions from EVs, PHEVs and FCVs from the tailpipe, and not including the upstream emissions associated with the generation of the electricity that powers these vehicles. EPA endorsed this approach in the previous rulemaking governing MYs 2012-2016 (up to a specific amount of vehicles), in the labeling rule and has proposed that approach for certain EVs, PHEVs, and FCVs in this rulemaking as well. The proposal to focus on tailpipe emissions is consistent with the policy objective of fostering electric vehicles and with the fact that automobile manufacturers only control tailpipe emissions and have no control over the fuel source for electric power. [EPA-HQ-OAR-2010-0799-9471-A1, p.18]

Moreover, any non-regulatory consumer information provided by website, label or otherwise, must present any upstream emissions information to consumers in a consistent fashion so that consumers will see not only the upstream emissions associated with electric vehicles but also the upstream emissions associated with other types of vehicles. The agencies should not provide any upstream emissions information to consumers based on a net adjustment for electric vehicles because such an approach unfairly suggests that ICE vehicles involve no upstream emissions and creates unnecessary confusion over the question of upstream emissions. If the agencies were to provide this information to consumers, the information should reflect the upstream emissions associated with each vehicle type and should further provide consumers with insight into how their region or location may differ from the national average. [17] [EPA-HQ-OAR-2010-0799-9471-A1, pp.18-19]

Policy Considerations Mandate Against Including Upstream Emissions [EPA-HQ-OAR-2010-0799-9471-A1, p.19]

In the prior rulemaking, EPA acknowledged that including consideration of upstream emissions would detract from the strong public policy support for encouraging the development of an electric vehicle market to enable the long term emissions reductions opportunities associated with electric vehicles. See 75 Fed. Reg. 25,323,25,341 (May 7, 2010). EPA stated that the agency would reassess the issue of how to address upstream emissions associated with EVs and PHEVs for MYs 2017-2025 based on: (1) 'the status of advanced technology commercialization,' (2) 'the status of upstream GHG control programs,' and (3) 'other relevant factors.' Id While the final rule was issued only twenty months ago, in May 2010, the same considerations leading to a focus on tailpipe emissions in that rule are equally applicable to the current proposal. [EPA-HQ-OAR-2010-0799-9471-A1, p.19]

The electric vehicle market remains embryonic and, as the experience with hybrid vehicles shows, will still be in its infancy when the proposed standards go into effect. Disparaging the substantial benefits associated with EVs, PHEVs and FCVs by focusing on the upstream emissions of the utilities that provide electric power detracts from the public policy of fostering the manufacture and sale of vehicles capable of emitting little or no tailpipe emissions. The proposed standards, furthermore, are aggressive and will require complex compliance planning for manufacturers, particularly in light of uncertain economic conditions and the need to invest in a variety of technologies; including within the compliance calculation a factor that is beyond the control of the automobile manufacturer inserts unnecessary ambiguity into that process. [EPA-HQ-OAR-2010-0799-9471-A1, p.19]

Indeed, EPA's proposal to use a national average does not account for the substantial regional differences-up to 3 times as much in the highest regions as compared to the lowest regions. Proposed Rule at 75,010, n. 280. EPA properly notes the unfair impact on the Nissan LEAF, which, using 2007 data, would have an upstream GHG emissions value of 161 grams per mile based on national average electricity, and a value of 89 grams per mile based on the average electricity in California, one of the initial Wave 1 markets for the Nissan LEAF and the state with the most Nissan LEAF sales to date. Id. at 75,011. [EPA-HQ-OAR-2010-0799-9471-A1, pp.19-20]

That disparity, moreover, may be greater in MYs 2017 and beyond. EPA is proposing to use national average GHG emissions rate of .574 grams/watt-hour for MYs 2017 and beyond. [18] Based on the EPA RIA upstream calculation method, the Nissan LEAF's upstream GHG emissions would be about 146 grams per mile during that period. Under CARB's recently adopted regulations, the Nissan LEAF's upstream GHG emissions value in MYs 2017 and beyond would be about 64 grams per mile. Thus, instead of the national average resulting in

GHG value 1.8 times higher than it actually is (based on 2007 data), use of the national average proposed by EPA projects to result in a GHG value 2.28 times higher than it actually is in MYs 2017 and beyond. [19] [EPA-HQ-OAR-2010-0799-9471-A1, p.20]

California is not the only initial Nissan LEAF market with comparatively low electricity GHG emissions; in fact, most initial Nissan LEAF markets have lower-than-average electricity GHG emissions. By accounting for upstream emissions using a national average, electric vehicle manufacturers would be penalized because their compliance standard will not be reflective of actual upstream emissions. [EPA-HQ-OAR-2010-0799-9471-A1, p.20]

The agencies have recognized the need to consider the vitality of the electric vehicle market during the mid-term review. At that time, the growth and potential for battery electric vehicles to reach critical mass will be better known. While it may remain necessary to continue to encourage electric vehicles through further incentives, the current status of the market compels continuation of the policy and program elements put into place just 20 months ago. [EPA-HQ-OAR-2010-0799-9471-A1, p.20]

Another factor weighing in favor of continued focus on tailpipe emissions is the upcoming regulation of greenhouse gas emissions from electric utility steam generating units. Although EPA has stated that 'there is currently no national program in place to reduce GHG emissions from electric powerplants,' the current proposal and the opportunity to focus on utilities between now and the model years covered by this proposal suggest that the agency should not force vehicle manufacturers to carry the burden of utility generators. Id. (emphasis added). Rather, the agency should ensure that each producer is responsible for the emissions it can control and cost-effectively reduce. [EPA-HQ-OAR-2010-0799-9471-A1, pp.20-21]

Not only is EPA's proposal to measure EVs as zero grams per mile the best policy decision to promote EV deployment, it is also legally required. EPA and NHTSA have chosen to utilize the current federal test procedure for measuring fuel economy in vehicles. Significantly, those procedures were designed to measure the tailpipe emissions from ICEs and provide for electric vehicles to be assigned a measure according to a petroleum equivalency factor. The testing and calculation procedures to be used in the CAFE and GHG programs do not account for upstream emissions in the production, refining or delivery of petroleum to vehicles operating on petroleum. [EPA-HQ-OAR-2010-0799-9471-A1, p.21]

In its previous rulemaking, in response to Nissan's suggestion that excluding upstream GHGs is legally required under Section 202(a)(l), EPA stated that Section 202(a)(l) granted it 'broad discretion in setting emissions standards,' and that this discretion 'included adjustments to compliance values adopted in final rule, the multipliers [EPA] proposed, and other kinds of incentives.' 75 Fed. Reg. at 25,437. Nissan agrees that Section 202 gives EPA discretion to incentivize new technologies, but Section 202 does not give EPA the authority to consider non-vehicle related emissions when setting compliance standards. Doing so would disrupt the careful structure of the CAA. [EPA-HQ-OAR-2010-0799-9471-A1, p.21]

The CAA governs emissions from both stationary and mobile sources. Specifically, Title I of the CAA regulates stationary sources, while Title II of the CAA regulates mobile sources.

Regulation of stationary sources is primarily left to the states, whereas the federal government sets nationwide emissions standards for mobile sources. See Jensen Family Farms, Inc. v. Monterey Bay Unified Air Pollution, 644 F.3d 934, 938 (9th Cir. 2011). EPA relies on Section 202 of the CAA-located in Title II-as the basis of its authority to regulation upstream emissions. See 75 Fed. Reg. at 25,437. Congress never intended that Title II encompass consideration of upstream emissions, however, nor has EPA ever considered these emissions. See Proposed Rule at 75,010 ('[T]raditionally the emissions of the vehicle itself are all that EPA takes into account for purposes of compliance with standards set under Clean Air Act Section 202(a).'). [EPA-HQ-OAR-2010-0799-9471-A1, p.21]

Section 202(a)(l) states that 'the Administrator shall by regulation prescribe (and from time to time revise) ... standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles . .., which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.' 42 U.S.C. § 7521(a) (emphasis added). That is, Title II is limited to consideration and regulation of emissions from the vehicle, not any other source. The House Committee report on Title II of the Clean Air Act similarly indicated that Section 202 requires the Secretary to promulgate standards applicable 'to the emission of substances from new motor vehicles or new motor vehicle engines.' H.R. Rep. No. 89-899, at 9 (1965) (emphasis added). Nowhere in Title II of the CAA or its legislative history does it indicate that EPA can take into account the upstream emission associated with a motor vehicle when establishing compliance values under Section 202. Doing so would undermine the careful structure of the CAA, which leaves stationary source regulation primarily to the states. Jensen Family Farms, Inc., 644 F.3d at 938. Consideration of upstream emissions from EVs would amount to an indirect regulation of stationary sources under Title I, which is impermissible. [EPA-HQ-OAR-2010-0799-9471-A1, pp.21-22]

Further, to the extent that EPA does decide to revise its testing procedures and consider upstream emissions associated with EVs-which it legally cannot-it is arbitrary to consider the upstream emissions associated with one type of vehicle and not the other. As Nissan noted in its comments on the previous greenhouse gas rulemaking, when regulating products, 'the overriding principle of fairness is always the same: the government must govern with an even hand.' us. v. Undetermined Quantities of an Article of Drug Labeled as Exachol, 716 F. Supp. 787, 795 (S.D.N.Y. 1989) (holding that the FDA applied an 'uneven regulatory policy' by not treating one product like similar situated other product). It is well-established that an agency cannot treat similarly situated parties differently without a reasoned basis for doing so. See, e.g., Burlington Northern and Santa Fe Ry. Co. v. Surface Transp. Bd., 403 F.3d 771, 776-777 (D.C. Cir. 2005) ('Where an agency applies different standards to similarly situated entities and fails to support this disparate treatment with a reasoned explanation and substantial evidence in the record, its action is arbitrary and capricious and cannot be upheld.'). There is no rational basis for EPA to discriminate in the regulatory program based on the form of fuel used, especially when doing so would hold manufacturers of advanced powertrains accountable for emissions they cannot control. [EPA-HQ-OAR-2010-0799-9471-A1, p.22]

In sum, the federal test procedure, which measures emissions from a vehicle's tailpipe, measures battery electric vehicle GHG emissions at zero grams of CO_2 per mile. See Proposed Rule at 74,964 ('The 0 gram per mile value accurately reflects the tailpipe CO_2 gram per mile achieved by [EVs, FCVs and the electric portion of PHEVs].'). Therefore, the compliance value of these vehicles should always be measured at zero grams per mile. EPA should not-nor does it have the authority to-increase this value based on consideration of upstream emissions associated with EV, PHEVs and FCVs, but not other vehicles. [EPA-HQ-OAR-2010-0799-9471-A1, p.22]

Additional Issues Relating to Upstream Emissions [EPA-HQ-OAR-2010-0799-9471-A1, p.23]

I. To the Extent Upstream Emissions Are Considered, EPA Should Adopt an Industry Wide Cap to Reward Early Investors in Advanced Vehicle Technologies [EPA-HQ-OAR-2010-0799-9471-A1, p.23]

Although Nissan strongly supports the exclusive focus on emissions from the tailpipe, EPA requests comment on elements of the proposed cap structure to the zero grams per mile standard for MYs 2022-2025, and in particular on the benefits of an industry wide cap versus a per-company cap. The two-tier, per-company cap would allow manufacturers that sold 300,000 or more EVIPHEV/FCVs combined in MYs 2019-2021 a cumulative production cap of 600,000 in MYs 2022-2025, and manufacturers that sold less than 300,000 EV/PHEV/FCVs combined in MYs 2019-2021 a cumulative production cap of200,000. Proposed Rule at 75,013. The industry-wide cap would place an industry-wide cumulative production cap of 2 million EV/PHEV/FCVs eligible for the zero grams per mile standard in MYs 2022-2025, which would be allocated to individual automakers in calendar year 2022 based on cumulative EVIPHEVIFCV sales in MYs 2019-2021. Id EPA notes that a small portion of the industry-wide cap may be reserved for manufacturers that sold zero EV/PHEVIFCVs in MYs 2019-2021. Id [EPA-HQ-OAR-2010-0799-9471-A1, p.23]

Any regulatory cap should be industry based in order to encourage investment in electric powertrains now for use in the coming model years, and the cap should not reserve any volume for manufacturers selling zero electric vehicles in MYs 2019-2021. Although the per-company cap encourages manufacturers to sell at least 600,000 advanced technology vehicles in MYs 2019-2021, the industry-wide cap will encourage manufacturers to exceed that total to maximize its share of the zero grams per mile standard in MYs 2022-2025. [EPA-HQ-OAR-2010-0799-9471-A1, p.23]

The per-company cap would also have the perverse effect of rewarding manufacturers that are lagging behind and not fully committed to investing in these game-changing technologies by allowing a guaranteed amount of vehicles to benefit from the zero grams per mile standard in MYs 2022-2025, regardless of whether the manufacturer sold any EVs, PHEVs or FCVs in MYs 2019-2021. [EPA-HQ-OAR-2010-0799-9471-A1, p.23]

The purpose of the proposed incentives is to encourage manufacturer investment in potentially game-changing technologies now to accelerate their adoption rate. Adopting an industry-wide cap will serve that purpose. [EPA-HQ-OAR-2010-0799-9471-A1, p.23]

II. PA's Proposed Phase-in Approach to Measuring Upstream Emissions Beyond the Cap will Incentivize Advanced Vehicle Investment and Increase Their Rate of Adoption [EPA-HQ-OAR-2010-0799-9471-A1, p.24]

EPA also requests comment on various approaches for phasing in from a 0 grams per mile value to a full net increase in upstream emissions value. Proposed Rule at 75,013. Nissan supports EPA's phase-in proposal, both for production beyond the cumulative cap in MYs 2022-2025, as well as production beyond the cumulative cap for MYs 20122016. The interim period between a zero grams per mile compliance value and full net increase in upstream emissions value should be equal to the number of vehicles each manufacturer can assign a zero grams per mile compliance value for MYs 2022-2025, and the interim period compliance value should be one-half of the net increase. Nissan supports a similar approach for MYs 2012-2016 (i.e., the number of vehicles subject to the phase in will be equal to the number of vehicles each manufacturer can assign a zero grams per mile standard in MYs 2012-2016). This approach would further incentivize manufacturers to invest in EVs and other advanced powertrains, increasing the rate of adoption of these technologies. [EPA-HQ-OAR-2010-0799-9471-A1, p.24]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 129-130.]

The production credits in the proposed rule are essential to incentivizing continued manufacturer investment in these advanced technologies, increasing their rate of adoption and the rate by which the United States will realize a zero emission society.

We also understand that certain groups have raised concerns about upstream emissions from energy-producing facilities that power the grids that charge the vast range of consumer goods including electric vehicles. The solution to the issue of emissions from energy production facilities is not to discourage the proliferation of electric vehicles or other consumer goods by devaluing their contribution to a cleaner environment. Discouraging that fleet by diminishing the way in which the environmental benefits are presented to the public will only serve to reduce the market for electric-powered vehicles, delay further serious advancements in low emissions electricity and perpetuate the domination of emission-producing internal combustion engines. We support the continued focus on tailpipe emissions in this program. While we have no control over the energy production facilities or their emissions, we also support public and private efforts to move the power supply towards renewable energy sources.

---

6 - The theories presented in Diffusion of Innovations are widely accepted. Indeed, Diffusion of Innovations is 'the second most-cited work in social science after Cook and Cambell's (1979) treatise on quasi-experimentation.' Arvind Singhal & Sweety Law, A Research Agenda for Diffusion of Innovations Scholars in the 21st Century: A Conversation with Everett M Rogers, 8 J. Develop. Comm. 39, 39 (1997). The various editions of Diffusion of Innovations have received numerous awards. 'In 1990, the Institute for Scientific Information designated Diffusion of Innovations as a 'Citation Classic' on the basis of the large number of citations (approximately 7,000) that it received in articles published in social science journals. This book was selected by Inc. magazine in 1996 as one of the ten classic books in business and in 2000 was designated as a 'Significant Journalism and Communication Book of the Twentieth Century' by Journalism and Mass Communication Quarterly. It was also awarded the first Fellows Book Award in the Field of Communication by the International Communication Association's fellows in 2000,' Diffusion

of Innovations at 551. Diffusion of Innovations has also been cited in two administrative reports from the Federal Communications Commission. See In Re: International Comparison Requirements Pursuant to the Broadband Data Improvement Act, 26 F.C.C.R. 7378, 7393 n.108 (May 20, 2011); Connecting America: The National Broadband Plan, 2010 WL 972375, *151 n. 29 (F.C.C. Mar. 16,2010). Finally, a Westlaw.com search of all law review articles and treatises revealed 93 law review articles that cite Diffusion of Innovations.

11 - Section 202(b)(6)(B) of the Clean Air Act (CAA) provided that upon the petition of a manufacturer, the EPA Administrator could waive the then-existing 1.0 grams per mile (gpm) NO_x standard to a level not to exceed 1.5 gpm for diesel-powered light-duty vehicles and engines manufactured in MYs 1981-1984. Upon receiving several manufacturer petitions in 1980, EPA granted waivers permitting emissions up to 1.5 gpm for MYs 1981-1982 diesel-powered light-duty vehicles manufactured by GM, Daimler-Benz, Volkswagen, Volvo, and Peugeot. See 45 Fed. Reg. 5,480 (January 23, 1980); 45 Fed. Reg. 34,719 (May 22, 1980).

13 - The proposed incentives, moreover, do not favor one technology over another to achieve compliance. Traditional ICE vehicles will remain a majority of the fleet and will continue to gamer significant investment in improved and advanced technologies. The incentives for electric drivetrains instead recognize the existing market barriers and will justify private investment in a longer-term, transformational solution to yet more substantial environmental benefits in the future.

14 - Examples of local governments supporting EV infrastructure development include Chicago's 'sip and gulp' approach will made available both a limited supply of direct connect charging stations and a more expansive number of Level 2 public charging stations. In addition, San Francisco recently placed in 20 city-owned garages throughout the city, which are free to use through 2013. See Cars.com, Chicago Plans Most-Electrified City in the us. (Feb. 8,2011), available at http://blogs.cars.com/kickingtires/20 1l/02/chicago-ev-stations.html (last visited January 5, 2012); Smartplanet.com, San Francisco will charge your electric car for free until 2013 (May 9,2011), available at http://www.smartplanet.comlblog/transportation!san-francisco-wi Il-charge-your-electric-car-for- free until- 2013/380 (last visited January 5,2012).

15 - Walgreens, for instance, has installed or plans to install approximately 800 EV charging stations across the country. See Walgreens Newsroom, First Walgreens Electric Vehicle Charging Station in Orlando Unveiled (Oct. 12, 2011), available at http://news.walgreens.com /article_display.cfm?article_id=5482 (last visited January 5, 2012).

16 - Examples include: Georgia Power offers a Plug-In Electric Vehicle time-of-use electricity rate for residential customers who own an EV or PHEV. The Indianapolis Power & Light Company offers special plug-in electric vehicle charging rates, including year-round time-of-use based options, for residential and fleet customers who own a licensed EV or PHEV. Louisville Gas & Electric offers a pilot Low Emission Vehicle time-of-use electricity rate for residential customers who own an EV or PHEV (limited to 100 customers). DTE Energy (in Michigan) offers a reduced electricity rate to qualified residential customers for charging EVs and PHEVs during off-peak hours. Nevada Energy (NV Energy) offers discounted electricity rates to residential customers in their Northern and Southern Service Territories who charge EVs or

PHEVs during off-peak hours. See Department of Energy, Alternative Fuels & Advanced Vehicles Data Center, available at http://www.afdc.energy.gov/afdc/laws/ (last visited January 5, 2012).

17 - The most recent labeling rule, which applies to MY 2013 and later vehicles, is limited to tailpipe-only GHG emissions. 76 Fed. Reg. 39,478, 39,492-93 (July 16, 2011). The labels for EVs, however, will include a clarifying statement, 'Does not include emissions from producing electricity,' and vehicles fueled without grid electricity will include the statement 'Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov.' Id. For PHEVs, the text '& electricity' will be added after the word 'fuel.' Id. The website will offer detailed information on upstream emissions, including regional-specific values, where appropriate. ld. Nissan supported this approach in the labeling rulemaking, and continues to do so. If EPA were to consider listing the upstream emissions associated with an EVon the vehicle label itself, however, it must do the same for all vehicles to prevent consumer confusion.

18 - Given the uncertainties associated with the electricity GHG emissions rate in MYs 2017 and beyond, EPA should reassess the appropriateness of the GHG emissions rate of .574 grams/watt-hour during the mid-term review, and revise it as appropriate.

19 - Upstream emissions vary not only by region, but also by service territory. For example, the utility company Seattle City & Light uses a combination of hydroelectric power and carbon offsets for 100% carbon free electricity, unique to the Pacific Northwest Region. Upstream emissions also vary by customer. For example, LEAF customers in a coal-heavy region that install solar technology on their roof will have an inaccurate measure for upstream GHG emissions.

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

Technology Incentives

NESCAUM supports EPA’s proposed zero gram per mile incentive for EVs and PHEVs as a reasonable short-term accommodation that recognizes the initial barriers to adoption of these technologies. While the zero emission factor for electricity used to power these advanced vehicles does not account for upstream emissions from electricity generation, application of this zero factor for MY 2017-2021 will provide auto manufacturers with greater incentives to deploy these technologies. We in turn support, in principle, EPA’s proposed sales cap, above which upstream emissions are included for MY2022-2025. The sales cap will help the program to achieve greater GHG emission reductions in the long term. [EPA-HQ-OAR-2010-0799-9476-A1, p. 2]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 72-73.]

EPA should continue to evaluate the GHG effects of these technology incentives to ensure preservation of the overall goals of the program. We also expect that EPA will monitor upstream emissions from the power grid to ascertain whether the improvements assumed to occur do in fact occur. In that regard, we strongly support the proposed mid-term review that will provide the opportunity to consider appropriate revisions to these incentives and to other aspects of the program. [This comment can also be found in section 2.4 of this comment summary.] [EPA-HQ-OAR-2010-0799-9476-A1, p. 2]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 73.]

While for this time frame we support the concept to forego accounting for net upstream electric power generation emissions, we in turn support in principle EPA's proposal for sales cap above which upstream emissions are included in model years 2022 through 2025.

Organization: Pennsylvania Department of Environmental Protection

Eliminate the Two-for-One Incentive Multiplier. EPA should not increase the manufacturers' sales incentives for EVs, plug-in hybrid electric vehicles (PHEVs) or fuel cell vehicles (FCVs) by including a 2-for-1 incentive multiplier. EPA is proposing that a manufacturer of EV s, PHEVs, or FCVs will receive a 2-for-1 incentive multiplier starting in 2017 that will decrease over time to 1-for-1 in 2025 for each EV, PHEV, or FCV sold. No cap on the number of vehicles sold would exist until 2022. By developing a new sales incentive solely for electrically powered vehicles, EPA is creating a disadvantage for vehicles powered by natural gas. In fact, vehicles powered by natural gas could have fewer emissions of GHG and have an overall smaller environmental footprint than vehicles powered by electricity in some, if not most, parts of the country. Congress recognized this fact and provided incentives in the CAFE program to manufacturers of all alternately fueled vehicles. In addition, the 2-for-1 incentive would appear either to be inconsistent with, or exceed the intent of, Congress as reflected in the CAFE· program. EPA has no legal or practical basis for providing this excessive incentive for EVs. We believe that the 2-for-1 incentive multiplier offer to manufacturers should be withdrawn, but if the incentive multiplier is not withdrawn, then gaseous alternative fuel vehicles should also be included in this incentive mechanism. [EPA-HQ-OAR-2010-0799-7821-A1, p. 4]

In addition, EPA needs to treat all alternative fuels as alternatives and not support EVs over vehicles alternatively fueled with gaseous fuels. [EPA-HQ-OAR-2010-0799-7821-A1, p. 5]

Organization: Pew Charitable Trusts

The proposed joint rule for model years 2017 to 2025 incentivizes the introduction of advanced technologies that seek to decrease U.S. dependence on foreign oil. Incentives designed to spur deployment of electric and hybrid vehicle technologies in the U.S. light duty fleet provide a clear path for auto manufacturers to invest in research, development, and production, which can improve the competitiveness of U.S. manufacturing and enhance exports to nations with growing demand. Investment in the research, development, production, and deployment of advanced vehicle technologies will help vehicle manufacturers located in the United States achieve the proposed standards, and present an opportunity for the U.S. to lead in new markets such as advanced batteries, which experts predict could be a $100 billion global industry annually by 2030. Pew is a strong advocate for the deployment of electric and hybrid vehicles and the necessary charging infrastructure, which could significantly reduce oil consumption and consumer fuel costs. [EPA-HQ-OAR-2010-0799-9496-A2, pp. 1-2]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2009-2010-11788, pp.18-19.]

Organization: Plant Oil Powered Diesel Fuel Systems, Inc.

2. The Proposed GHG Standards are arbitrary and capricious because their exclusive consideration of tailpipe GHG emissions fails to take into account the relative life cycle contribution to GHG emissions of various engine technologies and the energy sources that make them run. The analysis of the wells-to-wheels energy inputs associated with various technologies and fuels set forth herein demonstrates that the Proposed Regulations' apportionment of GHG credits to various technologies and fuels is irrational because it considers only tailpipe emissions. [EPA-HQ-OAR-2010-0799-10337-A2, p. 2]

c. re-do the weight the Agencies give to various alternative technologies and fuels according to a wells-to-wheels approach that corresponds more accurately with their relative contribution to and mitigation of atmospheric greenhouse gas accumulation; [EPA-HQ-OAR-2010-0799-10337-A2, pp. 2-3]

The Proposed Regulations base the GHG accounting primarily on tailpipe emissions. The Agencies, therefore, deem all electric vehicles to have zero emissions of CO_2 and zero fuel consumption. 76 Fed. Reg. at 74878. Through model year 2021, electric vehicles, hybrid electric vehicles, and hydrogen fuel cell vehicles receive a multipliers of between 1.3 to 2.0 times the amount of tailpipe CO_2 emissions reduced by the technology as compared to the same engine or vehicle without the alternative technology installed. Id. [EPA-HQ-OAR-2010-0799-10337-A2, p. 5]

A. Electric and Electric Hybrid Vehicles [EPA-HQ-OAR-2010-0799-10337-A2, p. 6]

The GHG theory behind electric vehicles is that they eliminate GHG emissions from the tailpipe and transfer any such emissions to less onerous upstream electricity production. The fallacy underlying this theory is stated in the Preamble to EPA's Proposed Regulations, as follows: [EPA-HQ-OAR-2010-0799-10337-A2, pp. 6-7]

At this time [], there is no [] comprehensive program addressing upstream emissions of GHGs, and the upstream GHG emissions associated with production and distribution of electricity are higher, on a national average basis, than the corresponding upstream GHG emissions of gasoline or other petroleum based fuels. [cite omitted] In the future, if there were a program to comprehensively control upstream GHG emissions, then the zero tailpipe levels from these vehicles have the potential to contribute to very large GHG reductions, and to transform the transportation sector's contribution to nationwide GHG emissions (as well as oil consumption). [EPA-HQ-OAR-2010-0799-10337-A2, p. 7]

76 Fed. Reg. At 75010 (emphasis added). It makes no sense to give electric vehicles any credit, much less a 100 percent credit, when "the upstream GHG emissions associated with production and distribution of electricity are higher, on a national average basis, than the corresponding upstream GHG emissions of [] petroleum based fuels." Id. [EPA-HQ-OAR-2010-0799-10337-A2, p. 7]

Even comparing solely tailpipe emissions, "[t]he energy efficiency assigned to electric vehicles [] does not account for the inefficiency associated with generating electricity from the combustion of fossil fuels." National Energy Technology Laboratory, "Battery-Powered Electric and Hybrid Electric Vehicle Projects to Reduce GHG's: A Resource Guide for Project Development" (July 2002), n. 119 (Exhibit 3). Research conducted by Argonne National Labs found that, "to achieve significant reductions in GHG emissions, [plug-in and battery-powered electric vehicles] must recharge from a generation mix with a large share of non-fossil sources (e.g., renewable or nuclear power generation)." A. Elgowainy, et al., "Well-to-Wheels Energy Use and Greenhouse Gas Emissions Analysis of Plug-in Hybrid Electric Vehicles," Argonne National Laboratory Report ANL/ESD/09-2 (Feb. 2009). Renewable sources contributed 10 percent of U.S. electricity generation in 2009. U.S. Energy Information Administration ("EIA"), "How much of our electricity is generated from renewable sources?" (Web: Feb. 11, 2012) (http://www.eia.gov/energy_in_brief/renewable_energy.cfm). In 2010, 45 percent of U.S. electricity was generated from coal. EIA, "What is the role of coal in the United States?" (Web: Jan. 30, 2012) (http:// www.eia.gov/energy_in_brief/role_coal_us.cfm). The combustion of coal produces 25 to 50 percent more CO_2 emissions than petroleum. Id. [EPA-HQ-OAR-2010-0799-10337-A2, pp. 7-8]

In the absence of a program to transform emissions from the upstream production of electricity to less carbon intensive sources, conferring on electric vehicles and hybrid electric vehicles a preference is irrational. It only encourages the introduction to the market of electric and hybrid vehicles that will contribute net more overall GHG emissions. Since a transforming upstream program is within EPA's authority under the Clean Air Act, the Proposed Regulations' favoring electric and hybrid electric vehicles is illogical and contradicts EPA's mission under the Clean Air Act. [EPA-HQ-OAR-2010-0799-10337-A2, p. 8]

B. Hydrogen Fuel Cells [EPA-HQ-OAR-2010-0799-10337-A2, p. 8]

The manufacture and sequestration of hydrogen to power a fuel cell requires an energy input and engenders some loss of energy content. EIA, Office of Integrated Analysis and Forecasting , Office of Coal, Nuclear, Electric and Alternate Fuels ("EIA OIAF-OCNEAF"), "The Impact of Increased Use of Hydrogen on Petroleum Consumption and Carbon Dioxide Emissions," at ix (Sept. 2008) (Exhibit 4). Reliance on hydrogen to power a mobile engine carries with it the same drawback of electricity: "[t]he main sources of hydrogen currently are hydrocarbon feedstocks, such as natural gas, coal, and petroleum, all of which also produce CO_2." Id., at xi (Exhibit 4). "Significant technical and infrastructure challenges" remain for the development of a large market for hydrogen fuel cell vehicles. Id., at ix (Exhibit 4) [EPA-HQ-OAR-2010-0799-10337-A2, pp.8-9]

In contrast, as set forth below, POP DieselTM has overcome the technical obstacles to the use of 100 percent plant oil and low-cost infrastructure that is independent of petroleum infrastructure is at hand. [EPA-HQ-OAR-2010-0799-10337-A2, p. 9]

Organization: Porsche Cars North America, Inc. (PCNA)

Porsche supports the proposed provisions for *advanced* technology multipliers. However, we believe that larger multipliers are justified, as an incentive for faster penetration of these technologies and to offset the significant development costs. The long-range GHG benefits of faster penetration far outweigh the effect on short term GHG fleet averages. We also propose that there should be no phase-out of AT multipliers for the duration of this rule. Each new application of a particular *advanced* technology requires significant development cost and time. It is not appropriate to assign an incentive to development projects over one 5-year period, and provide no incentive in the next. [EPA-HQ-OAR-2010-0799-9264-A1, p. 6]

In addition, we believe it is not appropriate to include upstream emissions in Light Duty GHG calculations for electric and plug-in hybrid vehicles. These emissions are not under the control of the automakers. We believe that the provisions for zero gram/mile upstream emissions for electric vehicles and plug-in hybrids should be made permanent. [EPA-HQ-OAR-2010-0799-9264-A1, p. 6]

Organization: Renewable Fuels Association (RFA)

EPA/NHTSA also propose significant incentives for certain dedicated (i.e. single-fueled) vehicles, which effectively creates an un-level playing field for FFVs. Specifically, EPA/NHTSA propose a GHG emissions compliance value of 0 for EVs, PHEVs (for the portion of operation that is electric), and fuel cell vehicles (FCVs). This proposal implies that operating one of these vehicles results in no GHG emissions whatsoever, despite EPA/NHTSA's acknowledgement that "[d]epending on how the electricity and hydrogen fuels are produced, these fuels can have very high fuel production/distribution GHG emissions (for example, if coal is used with no GHG emissions control)…" Indeed, on a full lifecycle basis, production of average electricity for use in EVs and PHEVs actually generates nearly 30% more GHG emissions per unit of energy delivered than petroleum.[3] [EPA-HQ-OAR-2010-0799-9490-A1, p.4]

EPA/NHTSA also propose providing a multiplier for all EVs, PHEVs, and FCVs, which would allow each of these vehicles to "count" as more than one vehicle in the manufacturer's compliance calculation. The agencies' reasoning for offering such a multiplier is that these vehicles, in their view, offer "the potential for game-changing GHG emissions and oil savings in the long term." We agree that EPA/NHTSA have a role in encouraging the production of vehicles that potentially reduce GHG emissions and oil consumption, but we believe favorable treatment under the rules should be afforded consistently to all vehicles that offer such potential. [EPA-HQ-OAR-2010-0799-9490-A1, pp.4-5]

While we strongly agree with EPA/NHTSA that automakers should be encouraged to produce vehicles that "[r]educ[e] petroleum consumption to improve energy security", "save the U.S. money" and "[r]educe climate change impacts," we believe incentives to stimulate the production of such vehicles should be constructed fairly and consistently. With regard to utility factors for fuel economy calculations and emissions compliance values, EPA/NHTSA should be consistent in the treatment of all dual-fueled vehicles. [EPA-HQ-OAR-2010-0799-9490-A1, p.5]

A. To ensure consistent treatment of vehicle/fuel options, EPA/NHTSA should consider basing emissions compliance values on direct "well-to-wheels" lifecycle GHG emissions. [EPA-HQ-OAR-2010-0799-9490-A1, p.5]

In order to accurately portray the GHG emissions impacts of various fuel/vehicle combinations when determining emissions compliance values, EPA/NHTSA should consider including upstream ("lifecycle") emissions that are directly related to the production and use of the fuel. This is particularly important for electricity because, as EPA/NHTSA acknowledge, "…there is currently no national program in place to reduce GHG emissions from electric powerplants." As proposed, compliance values would be based on an incomplete accounting of the vehicle's actual GHG impacts. While the bulk of lifecycle emissions for petroleum fuels occur at the tailpipe (i.e., as hydrocarbons are combusted in the internal combustion engine), the bulk of direct lifecycle emissions for EVs and the electric operation portion of PHEVs occur upstream and are associated with the production of electricity. For biofuels, the bulk of net lifecycle emissions also occur upstream during biomass production and conversion, as the principles of lifecycle accounting hold that biogenic CO_2 emissions at the tailpipe are equivalently offset by the CO_2 that was removed from the atmosphere by the biofuel feedstock during growth. Basing compliance values on full direct well-to-wheels lifecycle emissions would allow for "apples-to-apples" treatment of the GHG emissions associated with different fuel/vehicle options, whereas the use of tailpipe-only emissions provides only a partial picture of the GHG impacts of various platforms. Impartial GHG accounting misrepresents the true climate impacts of the CAFE/GHG program. [EPA-HQ-OAR-2010-0799-9490-A1, p.5]

---

3 - Lifecycle analysis conducted by the California Air Resources Board for the Low Carbon Fuels Standard found the well-to-wheels GHG emissions associated with "California average electricity" are 124.1 grams of CO_2-equivalent per mega joule (g/MJ), compared to 95.85 g/MJ for gasoline. In CARB's analysis, electric vehicles offer GHG savings relative to gasoline only after "Energy Economy Ratios" are applied to EVs and PHEVs to account for energy efficiency differences between electric drivetrains and internal combustion engines. http://www.arb.ca.gov/fuels/lcfs/022709lcfs_elec.pdf

Organization: Securing America's Future Energy (SAFE)

Upstream Emissions: In the proposed rule, EPA is proposing to account for carbon emissions from a limited number of EVs, PHEVs, and fuel cell vehicles (FCVs), by assigning to then a carbon emission value of zero grams per mile, with no limit on the number of vehicles eligible for such treatment, through MY 2021. Between model years (MYs) 2022 and 2025, EPA will assign a zero grams per mile value to the first 600,000 vehicles for companies that sell 300,000 EVs, PHEVs, and FCVs in MYs 2019–2021 and 200,000 vehicles for all other manufacturers. EPA believes that approximately 2 million cars will benefit from this treatment through MY

2025. For additional vehicles, EPA proposes to calculate upstream emissions (using the average carbon emissions per kWh of power generated), as estimated by EPA's Office of Atmospheric Programs' Integrated Planning Model. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 7-8]

SAFE believes that upstream emissions resulting from the operation of EVs, PHEVs and FCVs should not be attributed to the vehicles, even after MY 2021. For its entire 35-year existence, the fuel economy program at NHTSA, and the GHG emission program at EPA that has been incorporated into the fuel economy framework in recent years as part of the national program, has regulated only the direct consequences of operating a vehicle, whether the volume of fuel that the vehicle actually burned or the emissions directly emitted from the vehicle. Automakers have never been held responsible for the energy required to produce, process, and transport the fuel their vehicles consumed or that was consumed in the process of manufacturing the vehicles or any of their parts. Likewise, they have never been held responsible for the upstream emission of other regulated pollutants attributable to the production of fuel consumed by vehicles that they sold. [EPA-HQ-OAR-2010-0799-9518-A1, p. 8]

At the most fundamental level, automakers cannot reasonably be held accountable for the upstream consequences of power generation for any pollutant. These are emissions that they do not cause and over which they have absolutely no control. The emissions will vary for a wide range of reasons, from utility to utility, hour of day to hour of day, and customer to customer, even more so if a customer purchases "green power," a decision over which the automakers have no influence or control. EPA should consider carefully whether, and the extent to which, it is appropriate to hold automakers responsible for other parties' emissions that they cannot control or affect. [EPA-HQ-OAR-2010-0799-9518-A1, p. 8]

Doing so, in fact, would be a sharp departure from how EPA has typically regulated pollution. In each of its major programs, EPA has regulated polluters, and subjected them to regulatory requirements or penalties as a result of their direct actions. Power plants are responsible for their air emissions, water treatment plants for their effluent, and landfills for their leakage. We are unaware of other situations in which EPA regulates anyone other than the generator of pollution, even if other parties ultimately bear the financial costs of EPA's regulations. For example, water treatment facilities' customers are not responsible for compliance with the Clean Water Act, individuals whose trash haulers dispose of trash in landfills are not responsible for the landfill's compliance with the Resource Conservation and Recovery Act, and consumers of power are not held responsible for power plant emissions. Yet in this instance, the regulated party would be even further removed from the activity causing the regulated harm. The agency would be regulating Party A (automakers) for producing a device whose use by Party B (drivers) caused Party C (generators) to create carbon emissions. That would be akin to imposing responsibility for carbon emissions on Carrier, Dell, and Thermador because their HVAC systems, computers, and electric ovens and stoves consumed power whose generation was responsible for carbon emissions. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 8-9]

While we appreciate the difficulty of regulating carbon emissions from power plants in the absence of an economy-wide scheme to regulate carbon emissions, we do not believe that the political challenge that EPA faces in regulating carbon emissions from power plants should be used to justify deviating from its longstanding approach to regulating pollution. [EPA-HQ-OAR-2010-0799-9518-A1, p. 9]

EPA also should consider the extent to which regulating upstream emissions would conflict with future prospects of developing an economy-wide GHG regulatory system. Once some carbon emissions are regulated downstream, at the appliance level, it would be very difficult to regulate the remainder of emissions upstream, because of the inherent difficulty in separating upstream emissions that were attributable to regulated downstream activities from upstream emissions that were attributable to unregulated downstream emissions. Moreover, SAFE believes that attributing upstream emissions to the downstream product is a short term approach that will complicate EPA's long-term efforts to develop an approach to economy-wide regulation of carbon emissions. [EPA-HQ-OAR-2010-0799-9518-A1, p. 9]

Finally, if EPA decides to regulate upstream emissions from PHEVs, EVs, or FCVs, it also should regulate upstream emissions from all other vehicles to put all vehicles on an equal footing. If EPA's goal is to attribute all emissions resulting from the operation of a vehicle to the manufacturer of that vehicle, then that general principle should be fairly and equitably applied across all vehicles regardless of technology. [EPA-HQ-OAR-2010-0799-9518-A1, p. 9]

Multiplier Credit: To help promote the adoption of EVs, PHEVs, and FCVs, EPA's proposal creates an incentive multiplier for qualifying vehicles sold in MYs 2017 – MY 2021. The multiplier would treat each qualifying vehicle as more than one vehicle in the compliance calculation. The value of the multipliers is stated in Table 1. [Table 1 can be found on p. 9 of Docket number EPA-HQ-OAR-2010-0799-9518-A1] [EPA-HQ-OAR-2010-0799-9518-A1, p. 9]

SAFE believes that the multiplier is a valuable incentive to help promote the adoption of electric drive vehicles. Further, we believe the incentive is justified because of the critical contribution that the technology employed in the qualifying vehicles can make in improving our economic and national security. For the vehicles to achieve their potential, however, they will need incentives of sufficient size and duration for the vehicles to achieve scale, reduce costs, and penetrate the mainstream market. [EPA-HQ-OAR-2010-0799-9518-A1, p. 10]

The agencies' forecasts regarding the vehicle sales between MYs 2017 and 2021, indicates that they do not expect PHEVs and EVs to achieve significant market penetration over this time period. Through MY 2021, the agencies forecast cumulative sales of 381,160 EVs and PHEVs. If we generously assume that every one of those vehicles were an EV that consumed no gasoline, and each one replaced a vehicle with an internal combustion engine that travelled 15,000 miles a year and achieved 30 miles per gallon, the vehicles would reduce oil consumption by 12,400 barrels of oil a day out of nearly 20.63 million barrels per day of liquid fuel that EIA forecasts the United States will consume in 2021. Stated simply, this is a modest contribution to our economic and energy security, reflecting the fact that EVs and PHEVs will need more time to penetrate the marketplace. [EPA-HQ-OAR-2010-0799-9518-A1, p. 10]

If the agencies want to provide a sufficient level of assistance to help achieve an important national goal, SAFE believes that rather than phasing the vehicle multiplier out before it can help

EVs and PHEVs penetrate the mainstream marketplace, that EPA should keep it in place at the initial rate of 2.0 for EVs and 1.6 for PHEVs until the midstream review. At that time, the agency can evaluate its efficacy, and adjust it for the period through MY 2025 as appropriate. [EPA-HQ-OAR-2010-0799-9518-A1, p. 10]

However, SAFE also believes that EPA's proposed application of the multiplier credit to PHEVs is too narrow. EPA stated that for a PHEV to qualify for the multiplier, the vehicle must be able to complete a full 10.2 mile EPA highway test without using any conventional fuel, or have a minimum equivalent all-electric range of 10.2 miles as measured on the EPA highway cycle. SAFE believes that EPA could simplify this requirement, allowing a PHEV to qualify for the multiplier credit if it incorporates a battery with at least 4kWh of storage capacity. A midsize PHEV that travelled 2.5 miles per kWh of power would have about 10.2 miles of range. Moreover, Congress has determined that the use of PHEVs with a 4kWh battery is of sufficient national importance that it is deserving of substantial incentives, in the form of a federal tax credit. Changing the criteria to a simple minimum battery size requirement will simplify the regulation, and maintain consistency with EPA's overall goal and the national interest. It also would give appropriate credit to a PHEV whose design yielded substantial fuel savings even if it operated in a blended mode that made it difficult to travel 0 miles without using any liquid fuel. Alternatively, EPA could add a minimum battery size requirement as an alternative qualifying criterion that would allow vehicles to qualify for treatment as PHEVs based on a clear, simple, and objective criterion. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 10-11]

PHEV Utility Factors: While calculation of energy consumption by a single fuel vehicle is somewhat straightforward, calculation of fuel consumption of a dual fuel vehicle is more complex because one must estimate the amount of each fuel used in the operation of the vehicle. To calculate vehicle emissions and fuel consumption, EPA proposes relying on the use of "utility factors," which are ratios or percentages that indicate how much energy used by a PHEV comes from the grid and how much comes from onboard fuel. Because the operating cost for PHEVs are typically lower than liquid fueled vehicles and their emissions profile is typically better, utility factors that are too low will result in an overstatement of emissions, liquid fuel consumption, and operating costs. [EPA-HQ-OAR-2010-0799-9518-A1, p. 12]

The utility factors that the agencies used in the proposal are based on a standard developed by the Society of Automobile Engineers, SAE-J2841. The standard is based on data about daily vehicle miles traveled for about 32,000 days of vehicle travel. Briefly, to calculate a utility factor, the standard divides the sum of the number of miles each vehicle in the dataset traveled that would have been charge-depleting miles by the total vehicle miles traveled for a particular sized battery. [EPA-HQ-OAR-2010-0799-9518-A1, p. 13]

This approach makes sense on its face. Yet, SAE likely underestimated the utility factor for two separate reasons. First, SAE assumed that people who drive PHEVs will have similar driving patterns as those who drive traditional vehicles. SAE acknowledged the issue, even noting in an update of the standard that its initial calculation was "highly weighted towards [vehicles making] long distance trips." Second, the SAE standard also assumed that consumers will charge their PHEVs only once a day. [EPA-HQ-OAR-2010-0799-9518-A1, p. 13]

PHEVs carry a premium purchase price in exchange for lower operating costs. Customers who are willing to pay the premium for the vehicle, a substantial one at first, and one that they can only hope to recover by driving “electric miles” will have a strong incentive to drive “electric miles,” either by using the vehicles for commutes that are largely within their “electric range” or by midday charging, usually at work. The first point suggests that people who purchase PHEVs are likely to drive fewer miles per day than the average vehicle in the whole fleet, because drivers whose driving patterns can maximize the value of the PHEV powertrain are its most likely customer. The second point suggests that many PHEVs whose average daily vehicle miles travelled exceeds the electric range of the vehicle will have a strong inventive to charge their vehicles at work or elsewhere, and that the average driver of a PHEV is likely to charge their vehicle more than once a day. [EPA-HQ-OAR-2010-0799-9518-A1, p. 13]

SAE’s approach fails to recognize this high likelihood of these sales and usage patterns. To the extent that EPA’s calculation of utility factors relies on SAE’s methodology, EPA’s use of utility factors is flawed. [EPA-HQ-OAR-2010-0799-9518-A1, p. 13]

SAFE believes that it is reasonable to truncate the data set and eliminate from it trips that exceed either an absolute distance or a distance that is some function of the charge depleting range of the battery. SAFE also believes that a more appropriate utility factor methodology would recognize that some portion of the vehicles that travel more than the electric range each day will be charged more than once a day, generally (but not exclusively) at work. Doing so would more accurately portray how the PHEVs are likely to actually be used by the people who purchase them. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 13-14]

If the agencies choose not to adjust the utility factor calculation at this point in time, SAFE believes that the agencies should commit to evaluating the actual usage patterns of PHEVs within the next two years of the issuance of the final rule, and update the calculation of utility factors to reflect the manner in which the actual vehicles are really being used. Many of the vehicles and charging facilities used collect extensive data about vehicle usage, energy consumption, and charging patterns, which is being collected by automakers, charging infrastructure providers, and the Department of Energy. The data required to perform such analysis should be readily available. As part of that reexamination of utility factors, EPA and NHTSA should commit to examining how often PHEV owners charge their vehicles to determine if the assumption that they will only charge once a day is appropriate or needs updating. [EPA-HQ-OAR-2010-0799-9518-A1, p. 14]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 150-152.]

That the plug-in vehicles offer these great benefits to the nation justifies the incentives for this rule. The multiplier for EVs, for instance, will be an important incentive. We believe, however, it should not be phased down, as proposed. 10 years after entering the market the, 2.1 -- 1.9 million hybrid vehicles on the road represent about 2.1 of the new-car market. Yet if they are getting an average of 35 to 45 miles per gallon, they are saving the nation about 15- to 25,000 barrels a day out of the diet of 19 million barrels a day.

Plug-in vehicles have an opportunity to make a much greater contribution than traditional hybrids, but they are going to need some incentives in the meantime so that consumers can overcome their concerns about them, help bring demand up, get to economies of scale and bring the price down.

Secondly, we believe the upstream emissions should not be attributed to the plug-in vehicles. Until this proposal, cars had always been responsible for what comes out of the tailpipe, not the fuel that goes into the car. If automakers are held responsible for upstream emissions, they'll be unique in the economy as compared to manufacturers of other power-consuming appliance, such as air conditioners, well pumps or electric ovens. They cannot control upstream emissions, which will, in any event, vary from region to region, from consumer to consumer and over time. And in regulating total emissions, it will make it infinitely more difficult to later have a cap and trade program that incorporates emissions without endangering the whole count.

If, however, you do decide to regulate upstream emissions, they should be regulated for all vehicles, including petroleum-powered vehicles.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Address emissions associated with Electric Vehicles: Sierra Club believes that electric vehicles can and will play a critical role in providing Americans with oil free transportation. Automakers are bringing electric and plug in vehicles to the market and consumers are eager for the chance to drive without oil. Consistent with our position in the prior standards, we continue to have concerns with the impact failing to account for the emissions associated with EVs has on the overall emissions reductions benefits of the program. [EPA-HQ-OAR-2010-0799-9549-A2, p. 7]

The proposed rule accounts for electric vehicles as "zero-emission" in tabulating fleet-wide averages. While electric vehicles do not have tailpipe emissions, they do draw energy from the electrical grid, and the majority of electrical energy generation in the United States involves emissions of greenhouse gases.27 Thus, electric vehicles - unless powered by carbon-neutral sources of electricity, such as wind or solar - still contribute some amount of greenhouse gas emissions. By excluding these emissions, as the proposal does, along with a multiplier, the proposed rule gives a distorted and overstated picture of the reductions in greenhouse gas emissions flowing from the rule. [EPA-HQ-OAR-2010-0799-9549-A2, pp. 7-8]

EPA and NHTSA should revise the final rule to account for emissions associated with electrical generation to charge electric vehicles. In the alternative, the number of electric vehicles considered as "zero-emission" for the purpose of calculating fleetwide averages should be capped initially, and phased out over the course of the program. This would ensure that the final does not deliver distorted "reductions" in greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-9549-A2, p. 8]

In this proposal, EPA has adopted an approach of applying a multiplier for MY 2017-2021 while capping the quantity of vehicles eligible for 0g/mi accounting in MY 2022-2025. The tiered approach proposed by the EPA represents additional sales volumes of vehicles eligible for the 0 grams per mile credit as this credit already exists under the 2012-2016 standards. No more than 1 million electric vehicles should be treated as zero grams per mile vehicles in 2017-2025 to limit the pollution that would result from this incentive. Although the cumulative reductions in greenhouse gas pollution benefits from 2017-2030 is 4.3% at 1 million EV sales, it is even greater at higher sales volume. [EPA-HQ-OAR-2010-0799-9549-A2, p. 8]

We support the transition to accurate upstream accounting for any manufacturer that exceeds its cumulative production cap for EVs and urge that the final rule effectively limit the loss of emissions benefits of the program. [EPA-HQ-OAR-2010-0799-9549-A2, p. 8]

Although an incentive multiplier was proposed for EVs in the 2012-2016 standard it was not finalized as this incentive coupled with a zero emissions treatment would have reduce the greenhouse gas benefits of the standard. However, in the 2017-2025 standard to facilitate market penetration of advanced vehicle technologies as soon as possible, the EPA is again proposing an incentive multiplier for compliance purposes for electric vehicles sold in MY 2017 through 2021. EPA is proposing that EVs start with a multiplier of 2.0 in 2017 and phase down to 1.5 in MY 2021. EPA is proposing this multiplier as it deems EVs are necessary for compliance with standards. [EPA-HQ-OAR-2010-0799-9549-A2, p. 8]

We recommend a floating industry wide cap for number of EV sales eligible for zero emissions treatment in 2022-2025 be set at 1 million minus cumulative sales in 2017-2021 rather than the 2 million vehicle cap in the proposed rule. If sales exceed 1 million units, the zero emissions treatment would discontinue in 2021. There are several ways the agencies can allocate the industry wide cap among manufacturers, including an equal distribution among manufacturers and weighted allocation based on product plans, or a first come, first served approach. EPA proposes to phase-in an emissions factor for electric vehicles after 2022 for automakers that exceed their cumulative caps. The agency could phase-in the emissions factor sooner to avoid erosion of the overall program benefits. [EPA-HQ-OAR-2010-0799-9549-A2, pp. 8-9]

Plug-in hybrids should be counted in units of full plug-ins, in the same ratio as the fraction of miles they are assumed to operate on electricity from the grid. Plug-in hybrids would be required to achieve the same minimum all electric range as in relevant CARB regulations for its Zero Emission Vehicle program. [EPA-HQ-OAR-2010-0799-9549-A2, p. 9]

In sum, a strong final rule should ensure that greenhouse gas benefits of the program are maximized and the impact of the compliance flexibility afforded by the proposed EV credits should be minimized. [EPA-HQ-OAR-2010-0799-9549-A2, p. 9]

27 See U.S. Energy Information Agency, Electric Power 2010, Table ES1, Summary Statistics for the United States, 1999 through 2010 (Nov. 2011), available at http://www.eia.gov/electricity/annual/pdf/tablees1.pdf (showing that in 2010 approximately 70% of U.S. electrical generation was derived from combustion of coal, oil, or natural gas). [EPA-HQ-OAR-2010-0799-9549-A2, p. 8]

Organization: South Coast AQMD

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 69-70.]

To help alleviate these concerns, the South Coast AQMD staff strongly supports incentives for the purchase of light-duty vehicles that are cleaner than the applicable standards in as early as possible time frame. Increasing the penetration of cleaner vehicles will not only provide additional assurances that the fleet performance will be met, but also help reduce the overall cost of the cleaner vehicles in future years. This South Coast AQMD staff welcomes the opportunity to work with U.S. EPA and NHTSA on mechanisms to incentivize greater penetration of cleaner vehicles, especially zero and near-zero emission and alternative fuel vehicles.

Organization: Tesla Motors, Inc.

• EPA and NHTSA must enact a final rule that incentivizes EV technology but without detracting from development through consideration of issues outside the scope of this rulemaking. [EPA-HQ-OAR-2010-0799-9539-A2, p. 1]

In particular, Tesla agrees with EDTA’s position that upstream GHG emissions should not be included as a part of this rulemaking. In enacting the Clean Air Act, Congress expressly set forth a structure of emissions regulation that would address the individual sources of air pollution. The so-called “upstream sources” EPA would propose to include in this rulemaking are more appropriately regulated under Titles I and V of the Act, with the former establishing stationary source limits of air pollutants and the latter establishing a highly structured permitting framework under which compliance can be regulated. In fact, EPA has already signaled its intent to enact GHG regulation for stationary sources in future rulemakings. Addition of such emission sources in the current mobile source rulemaking would be an *ultra vires* application of the Agency’s authority to regulate tailpipe emissions. Such an extension of authority was not contemplated by Congress and could otherwise result in the dual regulation of a single source. EPA should, instead, focus on regulating GHG from stationary sources under the appropriate provisions of the Clean Air Act and limit application of this rulemaking to mobile sources only. [EPA-HQ-OAR-2010-0799-9539-A2, p. 6]

In addition, Tesla notes that despite the difficulty recognized by EPA in establishing single unified value for GHG emissions from electricity generation in the U.S. for EV’s, the Agency is proposing to do so through application of upstream emissions to motor vehicles. However, application of a nationalized figure fails to account for regional variability in electricity production, as well as the diverse distribution and use of various vehicle types throughout the United States. Moreover, such an approach fails to take into account the continuous improvement in emissions from major power generators. Accordingly, the attempted “one-size-fits-all” approach is neither appropriate nor accurate. [EPA-HQ-OAR-2010-0799-9539-A2, p. 6]

Tesla also takes issue with the method by which EPA attempts to count upstream emissions for internal combustion engines. While Tesla appreciates the Agency’s consideration of our comments to the Notice of Intent to Conduct Rulemaking for Model Year 2017 and Higher

Motor Vehicles where Tesla noted the failure to account for upstream GHGs for internal combustion engines, EPA's proposed solution is far from complete. Specifically, consideration of GHG emissions from refineries accounts for only a part of the emissions. To obtain a true accounting in a "wells-to-wheel" manner, EPA must also look to the emissions profile of oil exploration, production and transport. Regardless, such efforts are neither necessary nor appropriate. Instead, EPA should remove consideration of upstream emissions in a regulation enacted under Title II of the Clean Air Act, which should and must address tailpipe emissions only. [EPA-HQ-OAR-2010-0799-9539-A2, p. 6-7]

Tesla also supports the EDTA statements regarding EPA's proposed automatic termination of the credit multiplier for advanced technology vehicles in MY 2021, as well as challenging NHTSA's legal authority to enact such multipliers. Without providing a full restatement of the EDTA arguments, Tesla notes that incentives such as credit multipliers not only serve to accelerate the commercialization and widespread adoption of advanced technology vehicles like, EVs, they provide support for the businesses seeking to introduce such technology. [EPA-HQ-OAR-2010-0799-9539-A2, p. 7]

Tesla Motors has developed a business model that seeks to introduce EVs in the classic Silicon Valley fashion – namely, introducing low volume, high priced new technology with a unique value proposition and then rapidly moving down the cost curve by capturing increasing economies of scale. Much as the $5,000 cell phone of the 1980's demonstrated the capability of the then nascent cellular network, Tesla demonstrated that long-range, high performance EVs were possible utilizing lithium ion technology in a sports car package. This had the desired effect of catalyzing a competitive response from major automakers like General Motors. In order to continue that mission and move down the cost curve while ramping up the production curve, Tesla funneled the profit from Roadster sales into the Model S design and development. This alone, however, was insufficient to move to our next vehicle, the Model S. Accordingly, the Company was also able to generate additional capital from a variety of sources – including through the sale of credits earned under California's Zero Emissions Vehicle program. By being able to monetize ZEV credits, Tesla was able to generate additional capital enabling more rapid execution of the Company's business plan to Model S. [EPA-HQ-OAR-2010-0799-9539-A2, p. 7]

Like the California ZEV program, GHG and CAFE credits earned from production and sales of EVs like the Model S will allow Tesla to generate revenue for more rapid EV development and production. This will, in turn, speed the introduction of the next generation of EVs at higher volumes and lower price points (i.e., the Gen III). In addition, this will also assist in support of Tesla's power train business as well. EPA's automatic elimination of the credit multiplier and NHTSA's refusal to consider a CAFE multiplier will only delay the otherwise rapid deployment of EV technology not only by Tesla, but others as well. Accordingly, Tesla encourages EPA not to automatically eliminate the credit multiplier, but commit, instead to reviewing whether the multiplier is still needed as part of the mid-point review already proposed. Similarly, Tesla encourages NHTSA to revisit its authority to enact a CAFE multiplier for the reasons provided in EDTA's comments.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 94-95.]

And second, with respect to the consideration of upstream emissions, we believe that if this were to -- number one, it's adequately covered under Title V of the Clean Air Act. Moreover, pursuing this, this provision, could result in double counting. But in any event, if this were pursued, that we would encourage the agency to consider methodology on a well-to-wheel basis as opposed to simply stopping at the point of generation.

Organization: Toyota Motor North America

It is unclear that EPA has authority under Title II of the Clean Air Act to regulate upstream emissions from mobile sources. To the extent EPA is concerned with upstream emissions in power generation or fuel production resulting from potential expansion of electric and hydrogen fueled vehicles, it should regulate those sectors directly under other parts of the Act. [EPA-HQ-OAR-2010-0799-9586-A1, pp.2-3]

Advanced Technology Vehicle Credits [EPA-HQ-OAR-2010-0799-9586-A1, p.19]

EPA has proposed incentives to promote the commercialization of electric vehicles, fuel cell vehicles, and plug-in vehicles. The agency believes these technologies warrant incentives because they have the potential to nearly eliminate GHG emissions and petroleum use from vehicles, but face significant barriers today in terms of costs, infrastructure, and market acceptance. The first incentive allows an unlimited number of these vehicles to use a GHG emissions compliance value of 0 grams per mile (only during electric operation for PHEVs) through the 2021 model year, at which point upstream emissions are counted when production thresholds are exceeded. The second allows these vehicles to count as more than one vehicle for the purpose of calculating compliance with the fleet average CO_2 standards. The incentives are proposed to sunset after the 2021 model year. Toyota generally supports the intent to incentivize advanced technology vehicles, but has some concerns that are outlined below. [EPA-HQ-OAR-2010-0799-9586-A1, p.19]

Upstream Emissions Accounting [EPA-HQ-OAR-2010-0799-9586-A1, p.19]

Toyota opposes any requirement for automakers to account for upstream emissions in determining the compliance level of vehicles. First, automakers have no control over the level of upstream emissions and thus no ability to reduce such emissions to enhance compliance. Second, it is unclear that EPA has authority under Title II of the CAA to regulate upstream emissions from mobile sources. To the extent EPA is concerned with upstream emissions in power generation or fuel production resulting from potential expansion of electric and hydrogen fueled vehicles~ it should regulate those sectors directly under other parts of the CAA. Third, if EPA decides to include such emissions, there could be no end what other emissions automakers will be asked to account for~ including steel production emissions, rubber production emissions for tires, and so on. Clearly, Title II of the CAA was never intended extend the responsibility to automakers for these various emission sources. Finally, as the agencies recognized in the preamble, 'manufacturers are unlikely [to invest in PHEVs and EVs] if vehicles with these technologies are treated for compliance purposes to be no more advantageous than the best conventional hybrid'. [EPA-HQ-OAR-2010-0799-9586-A1, pp.19-20]

Organization: U.S. Coalition for Advanced Diesel Cars

To accomplish these goals, the Coalition supports technology-neutral regulations that create an environment of stability and predictability for auto makers and their suppliers. [NHTSA-2010-0131-0246-A1, p.1]

Our comments below assert that technology neutral policies and consumer acceptance are the only proven methods for the automotive industry to move forward with certainty and with the flexibility to seek and strive for new innovations that will dramatically improve fuel economy and reduce emissions. [NHTSA-2010-0131-0246-A1, p.1] [This statement also cross-referenced with section 18.1]

Members of the Coalition invest in every advanced automotive technology – not just diesel technology. We believe, therefore, that changes to Corporate Average Fuel Economy (CAFE) regulations should not be aimed at steering automakers to produce specific types of vehicles. Instead, the Environmental Protection Agency (EPA) and the National Highway Transportation Safety Administration (NHTSA) should employ technology-neutral policies that are outcome and performance based. Without such policies, EPA and NHTSA will be picking winners and losers, stifling innovation, limiting consumer choice, preventing significant increases in fuel economy today and potentially stunting job growth. [NHTSA-2010-0131-0246-A1, pp.1-2]

In 2009, the Coalition stated in response to the MY 2012-2016 joint rulemaking that the best way to drive innovation and achieve the desired outcomes of reduced petroleum consumption and lower greenhouse gas emissions is to provide automakers with regulations that are technology neutral. The “2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards Proposed Rulemaking” (NPRM) falls short of giving automakers a pathway to innovation as EPA and NHTSA clearly attempt to steer future vehicle production into technologies that, although promising in the future, will prevent American’s from maximizing improved fuel economy and reducing their greenhouse gas (GHG) emissions in the near- and medium-term. [NHTSA-2010-0131-0246-A1, p.2]

The auto industry cannot afford to make investment decisions based on inaccurate EPA testing data and inaccurate modeling. This is in stark conflict with President Obama’s call for rules that will “give our auto companies some long overdue clarity, stability and predictability.” See, Pres. Obama (press release) September 15, 2009. [NHTSA-2010-0131-0246-A1, p.3]

The Coalition urges EPA and NHTSA to refrain from expanding the system of CAFE credits based on specific technologies and instead offer manufacturers ONYLY performance-based credits. By supporting only performance-based credits, the agencies will have a greater role in incentivizing fuel economy improvements and GHG reductions with improvements in Internal Combustion Engine (ICE) vehicles. As ICEs are expected to dominate new car sales well beyond 2025, the agencies are more likely to accomplish their mission in reducing the nation’s dependency on foreign oil and dramatically reducing GHG emissions. [NHTSA-2010-0131-0246-A1, p.5]

Specific Technology Incentives are Unnecessary: The Coalition disagrees with the agencies' commentary about specific technologies. As stated previously, the goal of EPA and NHTSA should not be to identify or incentivize "advanced technologies." Instead, the focus should be solely on advanced fuel savings and GHG emission reductions. [NHTSA-2010-0131-0246-A1, p.5]

In stark contrast to the EPA's findings, researchers have affirmatively stated that technology specific incentives are not necessary. Researchers at the University of Michigan's Energy Institute & School of Natural Resources and Environment have stated that substantial opportunities exist for ongoing fuel economy gains through evolutionary technology change. [NHTSA-2010-0131-0246-A1, p.5]

"…but technology neutral policy provides the best benefit/cost ratios for consumers, industry and society. Even over a long-term time horizon — looking at 2025 as a milepost on the road to future GHG reduction needs — there is no scientific justification for favoring grid-connected vehicle electrification." (John M. DeCicco, Univ. of Michigan's Energy Institute & School of Natural Resources & Environment.) [NHTSA-2010-0131-0246-A1, pp.5-6]

Performance Based Standards Will Lead to Better Market Penetration: New technologies, changes to the driving habits of Americans and many other factors will make acceptance of certain technologies difficult to predict. We currently have advanced technologies that are readily available, reasonable priced and already accepted by consumers that can dramatically improve fuel economy and reduce emissions, without the need for infrastructure investment. [NHTSA-2010-0131-0246-A1, p.6]

In fact, a performance-based standard could achieve a remarkably higher effect on the environment than rules that steer towards certain technologies. What is clear is that the percentage of new vehicles sold in 2025 will be powered by internal combustion engines (ICEs). Incentivizing alternative technologies like hybrid, EVs and PHEVs will overlook common-sense improvements to the powertrain that will remain dominant in the marketplace throughout the course of the NPRM. A truly performance-based standard for credits will likely increase improvements to the ICE segment. These improvements will lead to greater fuel economy and lower emissions much faster than incentives limited to such a small percentage of cars. [NHTSA-2010-0131-0246-A1, p.6]

Expand Incentives to Advanced Technologies for ICEs: As stated in the NPRM, "EPA is not expanding the list of eligible advanced vehicle technologies primarily because all of these technologies utilize internal combustion engines, which have dominated the personal vehicle market for the last 100 years and do not present the same level of market challenges to automakers as EVs, PHEVs and FCVs." The goal of CAFE regulations and the Clean Air Act is not to overcome market challenges for alternative vehicle technologies. The Coalition requests that EPA and NHTSA expand incentives that seek to expand market penetration for all advanced vehicle technologies in order to achieve the nation's goals. [NHTSA-2010-0131-0246-A1, p.6]

In the current proposed rulemaking, production multipliers for each EV, PHEV and FCV are again proposed. These multipliers are distortive to the marketplace. Each of the "phantom" vehicles allowed under a multiplier scheme will result in less technology implementation on a real vehicle in the fleet; meaning more fuel consumption and more GHG emissions. The CAFE program is intended to control the fuel consumption of vehicles that are actually manufactured and sold into commerce, not to create market and competition distorting accounting methods that have government picking winners and losers. [NHTSA-2010-0131-0246-A1, p.8]

A strictly performance based credit system would allow manufacturers the flexibility to innovate and create a vehicle fleet that best suits their vision and customer base. Best of all, the manufacturers will be focused on looking at all available options to achieve the higher incentive levels with all available technologies. [NHTSA-2010-0131-0246-A1, p.8]

Of additional concern to the Coalition is EPA and NHTSA's decision to not calculate upstream emissions when determining incentives (credits) associated with all vehicle technologies. Such a decision is clear evidence that the agencies do not intend to proceed in a technology neutral manner. Under Section III of the NPRM, the agencies acknowledge the existence of upstream emissions but chose to only focus on GHG emissions at the tailpipe. (The NPRM justifies this calculation by identifying electric (EV), plug-in hybrid electric (PHEV), and fuel cell (FCV) vehicles as "game-changers.' [NHTSA-2010-0131-0246-A1, p.8]

As in the 2012-2016 rule, EPA is proposing temporary regulatory incentives for the commercialization of EVs, PHEVs, and FCVs. EPA believes that these advanced technologies represent potential game-changers with respect to control of transportation GHG emissions as they can combine an efficient vehicle propulsion system with the potential to use motor fuels produced from low-GHG emissions feedstocks or from fossil feedstocks with carbon capture and sequestration. EPA recognizes that the use of EVs, PHEVs, and FCVs in the 2017-2025 timeframe, in conjunction with the incentives, will decrease the overall GHG emissions reductions associated with the program as the upstream emissions associated with the generation and distribution of electricity are higher than the upstream emissions associated with production and distribution of gasoline. EPA accounts for this difference in projections of the overall program's impacts and benefits (see Section III.F). [NHTSA-2010-0131-0246-A1, p.8]

The tailpipe GHG emissions from EVs, PHEVs operated on grid electricity, and hydrogen-fueled FCVs are zero, and traditionally the emissions of the vehicle itself are all that EPA takes into account for purposes of compliance with standards set under Clean Air Act section 202(a). Focusing on vehicle tailpipe emissions has not raised any issues for criteria pollutants, as upstream emissions associated with production and distribution of the fuel are addressed by comprehensive regulatory programs focused on the upstream sources of those emissions. At this time, however, there is no such comprehensive program addressing upstream emissions of GHGs, and the upstream GHG emissions associated with production and distribution of electricity are higher, on a national average basis, than the corresponding upstream GHG emissions of gasoline or other petroleum based fuels. [NHTSA-2010-0131-0246-A1, p.9]

Stated more simply, EPA acknowledges that: [NHTSA-2010-0131-0246-A1, p.9]

EVs and PHEVs are responsible for more upstream GHG emissions than ICEs; [NHTSA-2010-0131-0246-A1, p.9]

New vehicles traditionally have their emissions regulated only at the tailpipe; [NHTSA-2010-0131-0246-A1, p.9]

The NPRM doesn't need to regulate EV and PHEV upstream criteria emissions because other regulations will do so; and [NHTSA-2010-0131-0246-A1, p.9]

No other program actually exists to account for upstream GHG emissions. [NHTSA-2010-0131-0246-A1, p.9]

Despite the conclusions of the agencies regarding upstream emissions, the Department of Energy's Energy Information Administration (EIA) disproved the conclusions of the EPA and NHTSA in January of 2009. In response to a Congressional inquiry, the EIA compared the well-to-wheel GHG emissions of a variety of light duty vehicles. The report clearly compared the GHG emissions of different advanced vehicle technologies and proved that the GHG emissions of several widely available technologies compare very favorably to EVs, PHEVs and FCVs. According to the EIA study in 2009, a well-to-wheel comparison of different vehicle technologies ranks electric vehicles, diesel and turbocharged gasoline engine vehicles within a 10% to 15% performance band. [NHTSA-2010-0131-0246-A1, p.9] [There is an associated figure, please refer to NHTSA-2010-0131-0246-A1, p.10]

The study compared vehicles on an equal footing: size and performance were held constant and only the powertrain was changed. The performance improvement of the next generation of internal combustion engines (ICEs), hybrids and EVs was calculated, and fuel economy and emissions were simulated on the usual U.S. standard test cycles. [NHTSA-2010-0131-0246-A1, p.10]

The need to meet aggressive national goals regarding our energy independence should not overshadow the reality of today's limitations faced by many advanced technologies. Primarily, car and light truck buyers will buy the vehicles that best meet their needs. We will achieve dramatic, game changing fuel savings and emission reductions by providing an evolutionary pathway for the advanced technologies that have proven market acceptance and are available today. This will provide the opportunity for new technologies to continue to develop into reliable, cost effective options that meet consumer needs. [NHTSA-2010-0131-0246-A1, p.13]

The investment in future technologies, such as vehicle electrification, go well beyond the engine bay to include sourcing and developing raw materials, complex vehicle integration and development, infrastructure support on a national level and increased costs for consumers forced to the cutting edge of what is still a boutique technology. [NHTSA-2010-0131-0246-A1, p.14]

Embracing a strictly performance-based standard will allow America to achieve the fuel savings and emissions reductions promised in the NPRM by the end of 2025. [NHTSA-2010-0131-0246-A1, p.14]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 242-243.]

Federal government's favoritism of hybridization and electrification continues in EPA and NHTSA's joint NPRM with two areas of particular concern to the Coalition. First, the NPRM presents a process of incentivizing specific technologies by establishing and awarding credits for 'game changing technologies,' such as a hybrid trucks and electric vehicles. Additionally, the NPRM continues to ignore the EPA and NHTSA's own data that shows the majority of miles traveled by the average American are on highway conditions instead choosing to favor and reward a technology that is best suited to city driving and start/stop conditions. The Coalition continues to advocate for policies that incentivize game-changing fuel savings by rewarding outcomes, not implementation of a specific technology.

Organization: Union of Concerned Scientists (UCS)

(c) Electric Drive Vehicle Incentives

Under the current federal vehicles greenhouse gas standards, models relying partially or completely on electricity or hydrogen receive significant extra credit towards meeting those standards. These extra credits do not represent actual reductions in greenhouse gas emissions, but rather were created as incentives for automakers to sell electric-drive vehicles. [EPA-HQ-OAR-2010-0799-9567-A2, p. 9]

In the 2017-2025 proposed rule, EPA is proposing compliance ledger accounting of EVs and FCVs (and partially for PHEVs) at zero grams per mile (g/mi) through model year 2021, well below the 103 g/mi the agency specifies a midsize EV would emit under a 2025 grid mix. Above and beyond that, the agency is proposing an additional “incentive multiplier” for EVs, FCVs, and PHEVs sold in MYs 2017 through 2021, whereby an advanced technology vehicle sold would count as more than one vehicle in the manufacturer’s compliance calculation. [EPA-HQ-OAR-2010-0799-9567-A2, p. 9]

UCS strongly opposed these incentives during the 2012-2016 rulemaking on the grounds that they do not reflect real emissions reductions and thus erode the benefits of the National Program and that there are other, more effective ways of accelerating the market for electric cars (e.g. the California ZEV program, federal tax credits, loan guarantees, and other state and local incentives). We continue to oppose them here for the same reasons, and express grave concern that they, like many auto industry incentives over the years, will again be extended and continue to undermine the goals of the program they serve. [EPA-HQ-OAR-2010-0799-9567-A2, p. 9]

UCS is particularly disappointed by the agency’s proposal on incentive multipliers, given its intellectual inconsistency with an EPA determination on the very same issue made only a year and a half earlier. As the agency noted in its May 2010 final rule on MY2012-2016 vehicle standards, “EPA is not finalizing a multiplier based on the concerns potentially excessive credits using that incentive [sic]. EPA agrees that the multiplier, in combination with the zero grams/mile compliance value, would be excessive.” 32 [EPA-HQ-OAR-2010-0799-9567-A2, p. 9]

EPA acknowledges this inconsistency in the proposed 2017-2025 rule, and offers up the following as an explanation: "While the Agency rejected a multiplier incentive in the MYs 2012-2016 final rule, we are proposing a multiplier for MYs 2017-2021 because, while advanced technologies were not necessary for compliance in MYs 2012-2016, they are necessary, for some manufacturers, to comply with the GHG standards in the MYs 2022-2025 timeframe." [EPA-HQ-OAR-2010-0799-9567-A2, p. 9]

This rationale is not supported by EPA's arguments. First, EPA's new interest in incentive multipliers is, by its own admission, rooted in catering to the industry's least-capable manufacturers. As noted throughout the proposal, numerous compliance pathways exist for meeting standards (including trading of credits between manufacturers, which alone should more than address the challenge cited by EPA above). EPA should not design and incorporate program loopholes to accommodate industry laggards when many other flexibility mechanisms already exist. Second, EPA states these multipliers are necessary for certain manufacturers to comply "in the MYs 2022-2025 timeframe," yet EPA is proposing that the multiplier incentive expire at the end of MY2021. Logically, this means that either (a) industry laggards expect the agencies (or will lobby them) to extend this incentive beyond the proposed 2017-2021 time frame, allowing even more time for all manufacturers to take advantage of the multipliers through 2025, further eroding National Program benefits; or (b) the industry laggards' only plan for complying with 2022-2025 standards is by using banked, inflated credits generated in 2017-2021, and are not planning for a technology pathway that will allow them to achieve 2025 standards. Concrete product plans for MY2022-2025 vehicles have yet to even begin; EPA should not endorse these industry arguments and weaken its program by introducing loopholes that either have the potential to balloon beyond proposed levels, or that encourage some in the industry to slow-walk fuel-saving technology deployment. UCS calls upon EPA to exclude the multiplier incentive in the final rule, on the "excessive" grounds noted previously by the agency, as well as to ensure that 0 g/mi treatment of these vehicles does not extend beyond MY2021. [EPA-HQ-OAR-2010-0799-9567-A2, pp. 9-10]

Though I strongly support these standards, I am concerned about possible loopholes that automakers could exploit. Specifically: The proposal largely ignores the pollution released from power plants when electric cars are recharged. The EPA should require automakers to fully account for their vehicles' pollution--whether from petroleum or power plants. [EPA-HQ-OAR-2010-0799-9713-A2, p. 2]

---

32 Federal Register Vol. 75, No. 88, p. 25401 [EPA-HQ-OAR-2010-0799-9567-A2, p. 9]

Organization: United Automobile Workers (UAW)

Likewise, the UAW supports the proposal by EPA to count each electric, plug-in hybrid and fuel cell vehicle as more than one vehicle in the manufacturer's compliance calculation for model years 2017–2021. The UAW is in strong agreement with EPA's proposal to assign a value of zero grams per mile for these vehicles when operating on electricity for the same model years 2017–2021. The UAW believes that zero grams per mile are the most faithful representation of the tailpipe pollution for a vehicle that in many cases has no tailpipe. Accordingly, while the UAW believes that the proposed caps for zero gram per mile treatment by the EPA for model years 2022–2025 are likely adequate to avoid assigning upstream emissions to large numbers of these vehicles, we urge the EPA to reconsider its stance that the emissions of electricity producers should be assigned to the products that use electricity. The proper place to measure and regulate these emissions is of course where the electricity is produced and the grid system that distributes electricity. [EPA-HQ-OAR-2010-0799-9563-A2, pp.3-4]

At the same time, we believe it is important to understand the changes in electricity sector emissions that will be caused by the addition of significant numbers of electric-drive vehicles to the fleet, and to be able to account for the net change in emissions in the switch from liquid fuels to electricity. To that end, the UAW encourages the EPA to continue to study how real-world electric vehicle use impacts the emissions of electricity producers. The efficiency of electric-drive vehicles in converting energy stored as electricity into distance traveled by the vehicle can and should be evaluated and eventually regulated. The efficiency of the charging systems for electric vehicles should also be measured and eventually regulated, perhaps as an appliance under existing Department of Energy authority. Improving the overall efficiency by charging an electric vehicle and converting that energy to miles driven will lead to the most effective and lowest cost scheme for realizing the most emissions reduction from increased adoption of electric-drive vehicles. [EPA-HQ-OAR-2010-0799-9563-A2, p.4]

Organization: Volkswagen Group of America

- Expand the range of technologies (beyond only electrification) which would qualify for emission incentives within the regulatory program in order to promote a broader set of fuel saving, low-CO_2 emitting options for consumers, i.e. alternative fueled vehicles, advanced combustion engines, etc. [EPA-HQ-OAR-2010-0799-9569-A1, p. 4]

Volkswagen proposes that the agencies expand the assortment of technologies credited within the regulatory program. As we understand, the intention of technology credits are to promote market availability of fuel saving and low-emission options for consumers. Currently the program achieves this for electrification and for technologies applied to full-size pick-up trucks. It is Volkswagen's position that a general expansion of the technology awarding credits could drive a greater number of technologies into the field and into vehicles other than just full-size trucks. [EPA-HQ-OAR-2010-0799-9569-A1, p. 28]

Organization: Volvo Car Corporation (VCC)

Also, the agencies proposed minimum electric or equivalent all-electric range for the definition of a PHEV for use of this advanced technology volume multiplier. [EPA-HQ-OAR-2010-0799-9551-A2, p. 12]

VCC supports the Alliance position that, upstream emission should be counted as 0 g/mile for the period 2012-2025. [EPA-HQ-OAR-2010-0799-9551-A2, p. 14]

VCC supports the advanced technology volume multipliers as proposed in the NPRM. VCC also suggests that the proposed multiplier be reviewed during the mid-term evaluation and potentially approved for continued use post 2021. [EPA-HQ-OAR-2010-0799-9551-A2, p. 12]

Organization: Weiner, L.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 107.]

The cap on electric vehicles should be strong so automakers cannot produce less efficient vehicles in other parts of their fleet yet still meet overall standard. Not that it would happen, but we want to make sure that no one games the system.

Response:

Introduction

EPA received a very large number of comments with respect to the proposed incentives for electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCVs). Most of the comments in this section addressed the same fundamental set of issues associated with incentives for EVs, PHEVs, and FCVs. The reader should note that most of the comments related to electricity are addressed in this section, while most of the comments related to diesel, compressed natural gas, ethanol, and other alternative fuels are in RTC Section 6. Many comments raise issues relevant to both this section and Section 6, sometimes even in the same sentence, so readers interested in a comprehensive treatment of comments on alternative fuel vehicles should read the comments and responses in both sections. In addition, comments related to gasoline fuel quality in general, and to ethanol/gasoline blends in particular, are addressed in RTC Section 11.

EPA rationale for temporary regulatory incentives for EV/PHEV/FCVs

There was a wide spectrum of comments on the overall appropriateness of regulatory incentives, ranging from complete opposition to any incentives whatsoever to support for stronger incentives than proposed.

EPA believes that temporary regulatory incentives are permissible under CAA section 202 (a), and justifiable here. These incentives promote the commercialization of technologies that have, or of technologies that can be critical facilitators of next-generation technologies that have, the potential to transform the light-duty vehicle sector by achieving zero or near-zero GHG emissions and oil consumption, but which face major near-term market barriers. [10] As such, the incentives are part of the process of determining the "period … necessary to permit the

[10] As BMW stated in its comments, "Multipliers encourage automakers to pull-ahead early generation low CO_2 technologies such as BEV, PHEV and FCV. Multipliers should be applied on advanced technologies with significant GHG reduction potential (which are much more expensive than mature gasoline technologies). Therefore, they are a motivation for automakers to move forward with cost-intensive technology (low volume, high investments) to reach full market economic viability"

development and application of the requisite technology" (section 202 (a)(2)) by creating regulatory incentives to shorten the time for "development and application". Although providing temporary regulatory incentives for certain advanced technologies will decrease the overall GHG emissions reductions associated with the program in the near term, EPA believes it is worthwhile to forego modest additional emissions reductions in the near term in order to lay the foundation for the potential for much larger "game-changing" GHG emissions and oil reductions in the longer term (EPA has adopted this strategy in previous mobile source rulemakings, such as its Tier 2 Light-Duty Vehicle, 2007 Heavy-Duty Highway, and Tier 4 Nonroad Diesel rulemakings, as well as the MYs 2012-2016 light duty vehicle GHG rule and the MYs 2014-2018 heavy duty vehicle and engine GHG rule). This objective is again fully in accord with the pollutant emission reduction goals of section 202(a). EPA accounts for the higher real world GHG emissions and lower GHG emissions reductions associated with these temporary regulatory incentives in all of our regulatory analyses.

Some proponents of incentives questioned EPA's legal authority to include upstream emissions in any compliance calculation under section 202(a), maintaining that section 202 (a) authorizes EPA to regulate only emissions "from … any motor vehicle[e]" and that upstream emissions are not from the vehicle (EDTA comment). EDTA also points to other provisions in Title II (sections 206 and 207) which, in the commenter's view, rest on the same predicate of control of tailpipe emissions only. The Alliance and other auto manufacturers argued that by including upstream GHG emissions in compliance calculations for EVs and PHEVs de facto requires automakers to meet utility GHG standards. A number of commenters also maintained that EPA was arbitrary in including upstream emissions in compliance calculations for electric vehicles but not for non-electric vehicles.

EPA disagrees with these commenters. Section 202(a) states that EPA must adopt "standards applicable to the emission of any air pollutant from any class of new… motor vehicle…." The provision does not directly address what the "standards applicable to" the emissions must be, or how those standards are to be measured. It does not specify how or what mechanisms EPA may reasonably use in applying a standard to vehicle emissions. This leaves EPA with discretion to develop both elements of the standards and the means of measuring compliance with them. See 75 FR at 25437.[11] EPA has done so in this rule, developing compliance values for use in meeting the attribute-based standards that recognize the overall GHG impacts of electric vehicles. Put another way, where appropriate, the standard applicable to emissions from electric vehicles reasonably can include use of a compliance value that better reflects the overall emissions impact of the vehicle, and this can include net upstream GHG emissions attributable to use of the fuel that powers the vehicle. The standard employs a compliance value to reflect those emissions when production exceeds the per-company production caps.

EPA has long interpreted section 202(a) as providing EPA the discretion to develop appropriate compliance calculations that in some cases differ from the actual tailpipe or leakage values for a vehicle. For example, a multiplier or other incentives for EVs are an adjustment to

[11] CAA sections 206 and 207, also referred to by the commenter, refer back to the section 202 regulations, and so do not provide any additional support for the commenters' argument.

the compliance calculation that does not reflect literal tailpipe emissions. EPA has authority to apply such adjustments where they are an appropriate mechanism to promote the overall emissions reductions achieved by the motor vehicle standards. Likewise, the use of a net upstream compliance value for EVs is an adjustment to the compliance calculation that appropriately reflects the overall emissions impact of the motor vehicle standards. Both of these kinds of adjustments fall within EPA's broad discretion to determine how a standard should be applied to emissions from motor vehicles. In the case of a multiplier for EVs, the standards are applied by artificially adjusting the number of times the tailpipe emissions level for an EV is used in the compliance calculation. In the case of the net upstream compliance value for EVs, the level of the tailpipe emissions are adjusted for use in the compliance calculation. In both cases, these adjustments to the actual tailpipe levels reflect reasonable and appropriate policy responses that further the emissions goals of the section 202(a) standards. Ironically, if the commenters were correct, EPA would have no authority to assign a multiplier or other incentives for EVs, since these multipliers also do not reflect literal emissions from a vehicle.

EPA does not believe that in doing so it is requiring auto manufacturers to control GHG emissions from utilities. As EPA explained when discussing this issue in the MYs 2012-2016 light duty vehicle GHG rulemaking, "EPA is not directly regulating upstream GHG emissions from stationary sources, but instead is deciding how much value to assign to a motor vehicle for purposes of compliance calculations with the motor vehicle standard. While the logical place to start is the emissions level measured under the test procedure, section 202 (a)(1) does not require that EPA limit itself to only that level." 75 FR at 25437.

Nor is EPA arbitrary in including upstream emissions in the compliance calculation for the standard applicable to the emissions from electric vehicles. As shown in preamble Table III-16 , upstream GHG emissions attributable to increased electricity production to operate EVs or PHEVs currently exceed the upstream GHG emissions attributable to gasoline vehicles. See preamble section III.C.2.c.v at n. 499; see also 75 FR at 25437. Moreover, as EPA found in the MYs 2012-2016 light duty vehicle rulemaking, the difference in upstream GHG emissions for both diesel fuel from oil and CNG from natural gas are relatively small compared to differences associated with electricity. 75 FR at 25437.

EPA thus believes that although section 202 (a)(1) of the Clean Air Act does not require the inclusion of upstream GHG emissions in these regulations, the discretion afforded under this provision allows EPA to consider upstream GHG emissions, particularly when such emissions from new technologies are higher than those from conventional vehicles. There is consequently a rational basis for EPA to account for this net difference.

Opponents of incentives emphasized three primary arguments: 1) that regulatory incentives are not technology neutral and therefore pick "winners and losers" among various advanced technologies, 2) that such incentives reduce the GHG benefits of the program, and 3) that incentives are no longer needed for technologies such as EVs.

EPA believes that the issue of technology neutrality is a much more complex issue than some commenters suggest when they advocate for a "level playing field," suggest that a level playing field is best achieved by no incentives, and that incentives cannot be "scientifically justify[ed]." Given that internal combustion engines and petroleum-based fuels have dominated the U.S. light-duty vehicle market for 100 years, with massive sunk investments, there are major barriers for new vehicle technologies and fuels to be able to gain the opportunity to equitably compete on any type of level playing field. For example, consider a hypothetical new vehicle/fuel technology that could be superior to conventional technology from a consumer perspective if, and only if, the vehicles and fuels could be produced at similar economies of scale. But, it is very possible that such a hypothetical new technology would never get the opportunity to compete at equivalent economies of scale, because of the very large investments that are needed, up front, to support the research and development, parts and vehicle production facilities, and fuel infrastructure, none of which are needed for conventional technology as these investments have been made in the past. In this context, temporary regulatory incentives do not so much "pick winners and losers" (as an inefficient or unattractive technology is not going to achieve long-term market success based on temporary incentives) as to give new technologies more of an opportunity to compete with the established technologies.

The agency agrees that the temporary regulatory incentives will slightly reduce the short-term benefits of the program and in fact the Agency accounts for the lower benefits in all of our regulatory analyses. But, as noted above, EPA believes that it is worth a limited short-term loss of benefits to increase the potential for far-greater game-changing benefits in the longer run. EPA also believes that temporary regulatory incentives may help bring some technologies to market more quickly than in the absence of incentives.

Finally, EPA disagrees that such incentives are no longer needed for EVs. Although it is true that several EV and PHEV models are now on the U.S. market, sales of EVs and PHEVs amounted to less than 0.2% of all sales in 2011.[12] Alternatively, vehicles with internal combustion engines that operate primarily on petroleum-based fuels continue to account for over 99% of all light-duty vehicles sold in the U.S.

At the same time, EPA believes there must be limits on the use of such incentives. For example, while temporary incentives can be justified as allowing a new game-changing technology, the opportunity to compete in the initial stages of technology commercialization when economies of scale are poor, permanent incentives are very different in that they would tilt the market even after a new technology has overcome the initial low economies of scale. In this case, the agency believes that temporary regulatory incentives best balance our dual objectives of achieving near-term GHG emissions reductions and promoting game-changing technologies that could provide even greater GHG emissions reductions in the longer-term.

Design of incentive multiplier for EV/PHEV/FCVs for MYs 2017-2021

Public comments on this topic mirrored those of incentives in general, i.e., those commenters that opposed incentives in general almost always opposed the proposed incentive multiplier for EV/PHEV/FCVs, while those commenters that supported the concept of incentives

[12] Total 2011 U.S. light-duty vehicle sales were 12.8 million (see http://online.wsj.com/article/SB10001424052970203513604577140440852581080.html, last accessed on July 10, 2012). Total 2011 U.S. EV/PHEV sales were less than 20,000 (see http://www.plugincars.com/nissan-leaf-sales-trump-chevy-volt-2011-111308.html, last accessed July 10, 2012, for total Leaf EV plus Volt PHEV sales of 17,345).

generally supported the proposed approach. Only a few commenters suggested a different multiplier design, i.e., higher multiplier levels or longer duration.

EPA disagrees with the comment by the Union of Concerned Scientists of "intellectual inconsistency" with the MYs 2012-2016 standards. In that rule, EPA did not project that advanced technologies like EVs and PHEVs were necessary to meet the MY 2016 standards so that no further incentive was needed. In contrast, EPA projects here that, for some manufacturers, EVs and PHEVs are in fact projected for meeting the much more stringent MY 2025 standards. As EPA stated in the proposal, providing multipliers for MYs 2017-2021 can lay the foundation for commercialization of these technologies that can then contribute toward compliance with standards in MYs 2022-2025. 76 FR at 75012. On the other hand, EPA disagrees with those commenters that support higher multipliers and/or multipliers of longer duration, as we believe that such incentives could lead to a significant reduction in program GHG savings, particularly if the incentives were to remain in effect past MY 2021 and if EV/PHEV/FCV sales increase significantly after that year. EPA believes it has struck a reasonable balance in finalizing the proposed multipliers for EV/PHEV/FCVs for MYs 2017-2021 (multipliers for CNG vehicles are discussed in Section 6). EPA reiterates that it is both reasonable and appropriate to accept some short-term loss of emissions benefits in the short run to increase the potential for far-greater game-changing benefits in the longer run. The agency believes that these multipliers may help bring some technologies to market more quickly than in the absence of incentives. In addition, the agency agrees with the Alliance of Automobile Manufacturers about the possible unintended consequences of a variable multiplier (e.g., based on electric range or battery capacity which, as the Alliance reasonably points out could encourage manufacturers to install battery capacity or power not demanded by customers thereby increasing vehicle costs), and is finalizing a fixed multiplier for all PHEVs that meet the eligibility requirements discussed below.

PHEV eligibility requirements

EPA received only a few comments related to eligibility requirements for PHEVs to be able to use the incentive multiplier. EPA agrees with Securing America's Future Energy that a 4 kilowatt-hour minimum battery energy storage requirement would be a reasonable approach, but because the Agency prefers performance-based metrics when possible, we are finalizing the proposed 10.2 miles all-electric or equivalent all-electric range that was supported by the Alliance of Automobile Manufacturers and Ford comments.

0 gram/mile compliance treatment for EV/PHEV/FCVs with MYs 2022-2025 per-company cap and net upstream GHG emissions compliance beyond cap

A large number of the above commenters addressed the related issues of the appropriateness of the proposed 0 grams/mile (g/mi) compliance treatment for EV/PHEV/FCVs, and of the proposed cumulative per-company vehicle production cap for this compliance treatment in MYs 2022-2025.

For an extensive summary of the key comments and EPA's response to the key comments, see Preamble Section III.C.2.c.v. As proposed for EV/PHEV/FCVs, EPA is finalizing the 0 g/mi compliance treatment with a cumulative per-company vehicle production cap for MYs 2022-2025, and net upstream GHG emissions compliance for production in excess of the cap. The cumulative per-company vehicle production cap for MYs 2022-2025 is 600,000 EV/PHEV/FCVs for those manufacturers that sell at least 300,000 such vehicles in MYs 2019-2021, and is 200,000 EV/PHEV/FCVs for all other manufacturers.

Methodology for determining net upstream GHG emissions compliance for EV/PHEVs beyond the MYs 2022-2025 per-company vehicle production cap

EPA proposed a relatively simplistic approach for calculating the net upstream GHG emissions compliance values for EVs and the electric portion of PHEVs, but signaled its intention to consider a more technically robust approach in the final rule. EPA received a few comments, which directly or indirectly supported a more sophisticated modeling approach based on better projections of the future electric power sector, a plausible regional distribution of plug-in electric vehicles, etc.

See Preamble Section III.C.2.c.vi for an extensive discussion of the key comments and multiple changes that EPA is finalizing, based on new work that EPA has carried out with the EPA Integrated Planning Model, a state-of-the-art electric power sector model. The results are new projections for the average GHG emissions factor for electricity used to support EV/PHEVs in the future, as well as for the multiplicative factor used to project the additional GHG emissions associated with electricity feedstocks.

The Edison Electric Institute commented that it would be better for EPA to wait until the midterm evaluation to adopt an electricity upstream GHG emissions factor. EPA disagrees with this comment. EPA believes it is critical to provide the automobile manufacturers, for their long-term compliance planning, a value that we expect to be used for compliance purposes in MYs 2022-2025, for those manufacturers who exceed their vehicle production caps for EVs and PHEVs since this value will become a part of their standard. We understand that there are many factors that could lead to an electricity upstream GHG emissions factor for EVs and PHEVs that may be higher or lower than our latest projection, such as future regulations, market forces, regional distribution of EV/PHEV sales, and vehicle charging patterns. EPA will continue to evaluate these factors, including in the mid-term evaluation.

Applicability of other program credits for EV/PHEV/FCVs

The Natural Resources Defense Council commented that, if necessary, other program credits should be limited such that no vehicle would effectively have a “negative” compliance value. EPA is finalizing, as proposed and consistent with the MYs 2012-2016 program, no restrictions on the use of GHG emissions credits for those vehicles eligible for the 0 g/mi GHG emissions compliance treatment, i.e., EV/PHEV/FCVs can earn air conditioner efficiency, air conditioner refrigerant, and off-cycle credits. EPA will be accounting for these credits at the manufacturer fleet level, not at the individual vehicle model level, though we accept the point by NRDC that, in effect, if one were to assess the actual credits earned on a per vehicle basis, the overall compliance value would appear to be negative. Because of the relatively small number of EV/PHEV/FCVs expected during MYs 2017-2025, EPA expects the fleetwide impact of these additional credits to be very small, and EPA does not want to discourage improvements in air conditioner and other technologies for EV/PHEV/FCVs that provide real world GHG emissions benefits.

5. Advanced Technology Credits for Full-Size Pickup Trucks

Organizations Included in this Section

Alliance of Automobile Manufacturers (AAM)
America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)
American Honda Motor Co., Inc.
American Petroleum Institute (API)
American Public Gas Association (APGA)
Association of Global Automakers, Inc. (Global Automakers)
Center for Biological Diversity
Chrysler Group LLC
Clean Energy
Eaton Corporation
EcoMotors International, Inc.
Encana Natural Gas Inc.
Ford Motor Company
General Motors Company
Honeywell Transportation Systems
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Marz, Loren C.
Mercedes-Benz USA, LLC
Motor & Equipment Manufacturers Association (MEMA)
National Wildlife Federation (NWF)
Natural Resources Defense Council (NRDC)
NGV America
Northeast States for Coordinated Air Use Management (NESCAUM)
Toyota Motor North America
U.S. Coalition for Advanced Diesel Cars
United Automobile Workers (UAW)
VNG.Co (VNG)
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers (AAM)

The following comments address EPA's proposed changes to 40 C.F.R. §600.116-12(c) for determining the proportion of recovered braking energy for hybrid electric vehicles. In 40 C.F.R. §600.116-12(c)(1)(i)(A) and (B), it is unclear whether road load power and applied deceleration power are to be calculated from scheduled speed or measured speed. We recommend that Vmph, V and Vt+1 be defined as "measured velocity in miles/hour, rounded to the nearest 0.01 miles/hour…"

In 40 C.F.R. §600.116-12(c)(1)(C), EPA proposes to determine braking power by the following equation:

Pbrake = Paccel – Proadload

We recommend that the equation be changed to the following:

Pbrake = Paccel + Proadload and if Pbrake >0, set Pbrake = 0

The Proadload should decrease the magnitude of the Pbrake term. As it is currently written, the magnitude of Pbrake is not decreased by Proadload during deceleration. If Pbrake isn't decreased by Proadload, the Emax equation would assume that the roadload force could be recovered by regenerative braking, and this would cause the Emax calculation to give a higher value than is possible (thus lowering the eventual Energy Recovered %).

As can be seen in the following chart, the proposed equation would indicate that roadload during steady cruising would be able to be recaptured as regeneration (red line). The green line is Emax when you replace the "-" sign with a "+" sign in the Pbrake equation and revise the Pbrake = 0 criteria. [see figure on p.8, EPA-HQ-OAR-2010-0799-9487, Appendix 7]

Therefore, it would be more appropriate if the equation were written as Pbrake = Paccel + Proadload with the additional criteria that Pbrake = 0 whenever the calculation results in a positive value.

In addition, the following clerical errors were discovered during our review of the NPRM:

§600.116-12(c)(1)(i)(A): Road load equation has an extra “x” between 0.47704 and 4.448

§600.116-12(c)(3)(iii): “battery” is misspelled as “batter”

§600.116-12(c)(4)(3)(iii): Definition of Erec under the Energy Recovered % equation references paragraph (c)(2)(iii), should reference paragraph (c)(3)(iii) instead

§600.116-12(c)(4)(3)(iii): Conflicting nomenclature. Energy Recovered % equation uses Emax, which appears to be called Ebrake in the paragraph referenced by the Emax definition, §600.116-12(c)(2).

Further, prior to the final rule, we plan to engage the agency technical experts to ensure that the test procedure specifications and regulatory language for determining the proportion of recovered braking energy is clear, accurate and consistent with previous hybrid procedural guidance (e.g., SAE J1711, Part 86, Part 600), where applicable. [EPA-HQ-OAR-2010-0799-9487, Appendix 7, p. 7-9]

Organization: America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)

“Game-Changing Pickup Technologies”

EPA has also proposed to “incentivize the penetration into the marketplace of ‘game changing’ technologies for full size pickups . . . [and] for that reason, EPA is proposing credits for manufacturers that hybridize a significant quantity of their full size pickup trucks, or use other technologies that significantly reduce CO_2 emissions and fuel consumption.” 76 FR 75016. If the agencies do not provide a multiplier incentive for NGVs as requested above, we ask that EPA clarify that natural gas-powered pickups would be able to qualify as a technology eligible for the proposed credits. [EPA-HQ-OAR-2010-0799-9548-A1, p. 8]

Assuming that NGVs are eligible for those credits, we note that for non-hybrid pickups to receive the proposed credits, they must achieve a “15 percent or 20 percent, respectively, better CO_2-reduction than their footprint based target in a given model year.” Id. at 75017. However, hybrid pickups do not have to meet any CO_2-reduction performance target in order to receive comparable credits, and we believe it would be appropriate and consistent to either apply identical performance targets to hybrids or, alternatively, eliminate the targets for “other technologies” that achieve equal or better GHG reductions. We also believe that the proposed thresholds (as a percentage of their full-size pickup production) that a manufacturer must meet before being able to receive these credits are way too high: starting at 15% in 2017, and ramping up to 40% in 2021 for the 15% CO_2-reduction credit and 10% for all model years for the 20% CO_2- reduction credit. Id. at 75017. If the goal of the incentive is to encourage deployment of these technologies, the initial levels should be far more modest. [EPA-HQ-OAR-2010-0799-9548-A1, p. 8]

Organization: American Honda Motor Co., Inc.

The preamble in the section titled “Incentives for “Game-Changing” Technologies Including Use of Hybridization and Other Advanced Technologies for Full-Size Pickup Trucks” notes that “the standards under consideration for MY 2017-2025 will be challenging for large trucks, including full size pickup trucks that are often used for commercial purposes and have generally higher payload and towing capabilities, and cargo volumes than other light-duty vehicles.” Honda believes that the same is true for minivans and SUVs and that these similarly situated vehicles ought to be treated in a similar fashion. Honda’s Pilot SUV and Odyssey Minivan are among the most popular vehicles in their segments. These vehicles have passenger load capabilities of up to 8 occupants and also are often used by families for the kind of high load usage described in the preamble. The 2012 Pilot 4WD, for example, is capable of carrying 8 occupants and also is capable of towing loads up to 4,500 lbs with the driver and one passenger. This kind of demanding use by consumers is similar in concept to the justification for the pick-up truck incentives proposed by the agencies. Honda believes that the incentives for “game changing” technologies be applied equally to 7 and 8 passenger vehicles with towing capabilities. [EPA-HQ-OAR-2010-0799-9489-A1, p. 2]

As noted above in #1, above, the stringency for the larger footprint light trucks is very low, compared to the smaller footprint light trucks. The combination of the lower stringency and the “game changing” credits cannot be justified as a matter of science, in furtherance of social goals and objectives or as a matter of simple fairness and equity. Not only are large footprint pick up trucks required to do very little (no stringency increase for a number of years), they are overly rewarded if they do increase their performance: in other words, required to do nothing, and highly rewarded for doing something. [This comment can also be found in section 2.2.3 of this comment summary] [EPA-HQ-OAR-2010-0799-9489-A1, p. 2]

Organization: American Petroleum Institute (API)

While API has no comment on the stringency of the proposed fuel economy and CO_2 standards, we are concerned that the proposal provides a number of incentives that appear to reflect an attempt to pick winning and losing technologies in the marketplace, an action which could potentially limit consumer choice and increase societal costs. [This comment can also be found in sections 4 and 6 of this comment summary.] [EPA-HQ-OAR-2010-0799-9469-A1, p. 1]

Incentives for Hybridization for Full-Size Pick-Up Trucks—EPA is proposing an additional CO_2 per vehicle credit for mild and strong hybrid electric (HEV) full size pickup trucks if this technology is utilized across a designated percentage of a manufacturers' full size pickup trucks. [EPA-HQ-OAR-2010-0799-9469-A1, p. 1]

Organization: American Public Gas Association (APGA)

With respect to pickup trucks, EPA also has proposed a special credit for pickup trucks that utilize GHG reducing technology. This credit would be worth 10 g/mi or 20 g/mi depending on the reductions. In order to get the 20 g/mi credit technology would have to provide a 20% reduction in GHG emissions. To qualify, technology would have to be used on at least 10% of full size pickups for manufacturers and credits limited to 5 MYs. APGA strongly supports this change and believes that it will be very beneficial in aiding the deployment of NGV pickup trucks and refueling infrastructure. [EPA-HQ-OAR-2010-0799-9448-A1, p. 3]

Organization: Association of Global Automakers, Inc. (Global Automakers)

The advanced technology credits provide an incentive for manufacturers to continue to develop and market these technologies, which have the potential for substantial long term improvements in fuel efficiency and emissions performance. [EPA-HQ-OAR-2010-0799-9466-A1, p. 1]

Global Automakers supports the inclusion of advanced technology incentives as an integral part of the MY 2017-25 standards program. As stated in the agencies' proposal, such vehicles have the potential to achieve major emission reductions and improvements in fuel efficiency, but face near-term market barriers relating primarily to price and fueling infrastructure. The incentives proposed by EPA provide a bridge to overcome these near-term obstacles. [EPA-HQ-OAR-2010-0799-9466-A1, p. 7]

The agencies also propose an incentive for "game-changing" technologies used in large pick-up trucks. Also provided as an incentive for larger trucks are certain adjustments to the slope of the truck curve, to reduce the stringency of standards for those vehicles. The agencies justify these incentives based on what they see as special compliance burdens of these vehicles, including "generally higher payload and towing capabilities and cargo volumes than other light duty vehicles." See 76 FR 74944. In our view, other classes of vehicles may face similar compliance obstacles, or obstacles that, while different in nature, are still significant. [EPA-HQ-OAR-2010-0799-9466-A1, pp. 7-8]

We urge the agencies to consider extending "game-changing credits" to other vehicle classes, such as minivans or SUVs with towing capabilities. These credits should also be reassessed as part of the mid-term review process, to determine whether they should be modified. [EPA-HQ-OAR-2010-0799-9466-A1, p. 8]

Organization: Center for Biological Diversity

In addition to the improper credits discussed below, the NPRM contains yet another sweetener that cannot but lead to even more pickup trucks used as passenger vehicles. EPA is seeking comment on changing the definition of a full-size pickup truck by reducing the minimum wheelhouse width requirement from 48 inches to about 42 inches, as long as the vehicle remains capable of towing at least 6,000 lbs. Such a redefinition is entirely inappropriate. The Agencies provide no reasonable basis for this request, and entirely overlook the fact that it would enable virtually every pickup truck to fall into the full-sized pickup truck definition and escape higher fuel efficiency standards. The Agencies must not take this step backward. [EPA-HQ-OAR-2010-0799-9479-A1, p. 14]

2. The pickup truck credits must be eliminated

As yet another preference for the dirtiest vehicles in the fleet, the Agencies propose a credit of 10 g/mile for each pickup truck that either has mild hybrid technology or achieves an emission rate 15% higher than the standards in any year from MY 2017 to 2021 (if certain minimum production rates are met); and a credit of 20 g/mile for each pickup truck that is either uses strong hybrid technology or achieves an emission rate 20% higher than the standard for that year (if minimum production rates are met). [EPA-HQ-OAR-2010-0799-9479-A1, p. 22]

This give-away is ill-conceived for a number of reasons. First, hybrid technology is one of the most effective technologies to improve these vehicles' fuel efficiency. It is both technologically and economically feasible,103 and failing to require – rather than to incentivize – its use is contrary to statutory intent. In fact, none of the factors the Agencies must consider in setting standards argues for anything other than immediate and mandatory application of this technology across the entire fleet as quickly as possible. In addition, as with all other credits, it would displace the implementation of other fuel efficiency measures such as stronger hybrids or EV vehicles. Moreover, the Agencies admit that these credits do not correspond to the actual improvements obtained.104 [EPA-HQ-OAR-2010-0799-9479-A1, p. 22]

---

103 Ford and Toyota have already announced a joint venture to develop the systems for pickup trucks. ICCT Comments at 36. The profitability of trucks, discussed above, nullifies any cost concerns, even when the hundreds of billions in other benefits flowing from increased fuel efficiency standards are disregarded. [EPA-HQ-OAR-2010-0799-9479-A1, p. 22]

104 NPRM, 76 Fed. Reg. 74879. [EPA-HQ-OAR-2010-0799-9479-A1, p. 22]

Organization: Chrysler Group LLC

Chrysler agrees with the Agencies' support for "game-changing" full-size pickup truck technology and recommends improvements for its regulatory implementation. (Attachment 3)

Chrysler agrees with the Agencies expectation that the proposed standards will be challenging for fullsize light-duty trucks. The proposed rules will provide additional incentives to manufacturers for early development of the technologies which will be needed to meet 2022-2025 MY light-duty truck standards. Chrysler recommends that the agencies retain as much flexibility as possible both for which light-duty trucks will qualify and for how those light-duty trucks are defined. The proposed definitions for qualifying vehicles need to be defined so as to capture the intended population of vehicles. Also, establishing minimum penetration rate thresholds is an unnecessary additional constraint on the use of these incentives. [EPA-HQ-OAR-2010-0799-9495-A1, p. 6]

Chrysler supports EPA's proposed incentives for "game-changing" technologies on fullsize pickup trucks and other high-utility light-duty trucks.

Full-size pickup trucks are frequently purchased by customers who need varying combinations of payload, trailer towing, four wheel drive, and passenger carrying capability. These utility-adding features enable Chrysler's customers to satisfy their transportation, business, and recreational needs. However, adding features to enable increased cargo and trailer tow capabilities can challenge high-utility vehicle energy efficiency. [EPA-HQ-OAR-2010-0799-9495-A1, p. 12]

Some "game-changing" technologies already exist, or are under development, but such technologies come at a cost-premium and may compromise vehicle utility. For example, vehicle hybridization and advanced diesel engines are significantly more expensive than conventional gasoline powertrains. These technologies also increase vehicle curb weight, thereby reducing payload and towing capability unless further modifications are made to the vehicle. [EPA-HQ-OAR-2010-0799-9495-A1, p. 12]

It is appropriate to encourage "game-changing" technologies in this segment and help to minimize the tradeoffs between efficiency and utility. [EPA-HQ-OAR-2010-0799-9495-A1, p. 12]

The definitions for a "full-size" vehicle should capture the intended vehicles both now and in the future.

The automotive market continues to evolve. Given that this regulation will affect vehicles produced far into the future, the agencies should strive to leave vehicle-based definitions as broad as possible. Establishing narrow definitions for what vehicles qualify for "full-size" game-changing technology incentives may lock manufacturers into producing vehicles within these design constraints instead of creating innovative ways to provide similar or better utility and game-changing fuel economy for future customers. [EPA-HQ-OAR-2010-0799-9495-A1, p. 12]

Chrysler agrees that the definitions which qualify light-duty trucks for "game-changing" technology incentives should reflect utility-adding features.

Chrysler agrees that payload and towing capability are two key utility-adding features. EPA and NHTSA recognized these features as “work-based attributes” in their medium- and heavy-duty truck greenhouse gas and fuel efficiency rules for heavy-duty pickup and van standards. The use of payload and towing capability to define a higher utility light-duty truck is a logical extension of the reasoning provided by EPA and NHTSA therein. [EPA-HQ-OAR-2010-0799-9495-A1, p. 13]

Light-duty trucks which meet minimum payload and/or towing capability should qualify for the “full-size” hybrid and performance-based incentives - an open cargo box should not be required.

EPA and NHTSA are proposing that these incentives be applicable only to full-size pickup trucks, with one qualification being an “open cargo box”. However, large light-duty trucks without open cargo boxes include many of the same utility-adding features as full-size pickup trucks. For example, a number of Chrysler’s Dodge Durango and Jeep Grand Cherokee variants meet or exceed the capabilities of full-size Ram 1500 pickup trucks, as shown in Figure 1 below. [See Figure 1 on p. 13 of Docket number EPA-HQ-OAR-2010-0799-9495-A1] [EPA-HQ-OAR-2010-0799-9495-A1, p. 13]

These higher utility vehicles are purchased by customers not only for their passenger-carrying capability, but also for their payload and towing utility. Many of Chrysler’s customers desire vehicles which can transport both a family and commercial or recreational trailers. [EPA-HQ-OAR-2010-0799-9495-A1, p. 14]

These utility requirements can create the same vehicle efficiency challenges in these other large light-duty trucks as they do in full-size pickup trucks. In incentivizing technology which causes “game-changing” vehicle efficiency improvements while maintaining vehicle utility, non-pickup large light-duty trucks should also be encouraged to make similar improvements. Therefore, Chrysler recommends that any light-duty trucks which meet minimum payload or towing capability requirements qualify for these incentives. [EPA-HQ-OAR-2010-0799-9495-A1, p. 14]

If finalized, open cargo box requirements should allow greater flexibility in dimensions and “open” criteria; Chrysler recommends reducing minimum box size requirements and permitting greater flexibility in bed area coverage.

The agencies propose to set minimum open cargo box dimensions which appear to be based on today’s largest pickup trucks. By setting the minimum dimensions to today’s largest pickup trucks, the agencies drive the unintended consequence of also incentivizing manufacturers to design to these dimensions. If the agencies were to instead reduce or eliminate the minimum dimensions of an open cargo box, manufacturers would have more freedom to invent new designs which could satisfy customer cargo carrying needs in a more efficient manner. [EPA-HQ-OAR-2010-0799-9495-A1, p. 14]

The agencies also propose that a full-size pickup include an “open box”, defined as “a vehicle where the cargo box does not have a permanent roof.” The restriction that the roof not be permanent is a distinction that may encourage manufacturers to make use of potentially less aerodynamically efficient designs to qualify a vehicle for the “game-changing” technology incentives. In contrast, keeping the "open box" definition flexible, for example to allow a design with a permanent pickup truck cap (extending the roofline of the cab to rear of the box) could be an aerodynamic improvement if designed properly. Chrysler recommends that if the "open cargo box" requirement is finalized, the definition also include that "a covered box not readily accessible from the passenger compartment will be considered an open cargo box for the purposes of this definition". [EPA-HQ-OAR-2010-0799-9495-A1, p. 14]

Chrysler recommends that the Agencies set the minimum payload capacity at 1,300 lb. and the minimum towing capacity at 3,500 lb.

The agencies propose to limit applicability of "game-changing" full-size pickup truck incentives to vehicles which meet a minimum payload capability of 1,700 lb. or which meet a minimum towing capability of 5,000 lb. The Agencies intended that these limits would qualify larger pickup trucks while excluding smaller pickup trucks.17 However, these limits exclude a number of Chrysler's full-size 2012 MY Ram 1500 pickup truck variants, (as demonstrated in Figure 2), that were designed to meet customer utility requirements, and therefore which should not have be excluded from the "game-changing" technology incentives. [EPA-HQ-OAR-2010-0799-9495-A1, p. 14]

Chrysler notes that virtually none of the 2012 MY full-size Ram 1500 pickup trucks are capable of meeting the minimum payload requirements as proposed, even though these full-size trucks provide significant payload carrying capability and are designed to meet the utility needs of our customers. We recommend lowering the minimum payload capability requirement to 1,300 lb. [See Figure 2 on p. 15 of Docket number EPA-HQ-OAR-2010-0799-9495-A1] [EPA-HQ-OAR-2010-0799-9495-A1, p. 14]

Similarly, Chrysler recommends that the minimum towing capability be lowered to 3,500 lbs if the proposed towing capability definition is finalized. Under the proposed definition, certain current and potential future Ram full-size trucks with maximum trailer capacities greater than or equal to 5,000 lb. are excluded. An alternative to lowering the minimum towing capability would be to strike the proposed definition of trailer tow capability (GCWR – GVW) and to define towing capability as meaning "the value specified by the manufacturer as the maximum towable trailer weight, consistent with good engineering judgment. For example, compliance with SAE J2807 is generally considered to be consistent with good engineering judgment." [EPA-HQ-OAR-2010-0799-9495-A1, pp. 14-15]

Minimum penetration rate requirements increase uncertainty for manufacturers and are an unnecessary constraint. [EPA-HQ-OAR-2010-0799-9495-A1, p. 15]

The agencies propose that to qualify for the "full-size" hybrid and performance-based incentives, a manufacturer must meet a minimum penetration rate. These minimum penetration rates add a level of uncertainty for manufacturers and are an unnecessary additional constraint for incentives offered on a per-vehicle basis. [EPA-HQ-OAR-2010-0799-9495-A1, pp. 15-16]

Minimum penetration rates add a level of uncertainty for manufacturers. If a manufacturer invests in the technologies necessary to hybridize a full-size vehicle, or to significantly over-perform to a vehicle's footprint-based target, it still may not meet the required minimum penetration rate if market demand is not sufficient. For example, manufacturers could choose to invest in the necessary technologies, but if market demand is only 9% against a required 10% penetration threshold, those investments would not generate the credits expected by a manufacturer. Before approving funding for such investments, manufacturers need certainty that their investment will realize expected benefit of making those investments. Introducing the uncertainty of minimum penetration rate requirements creates a disincentive to adoption of game-changing technologies until market demand is proven. [EPA-HQ-OAR-2010-0799-9495-A1, p. 16]

Minimum penetration rate requirements are also an unnecessary additional constraint on the proposed incentives. Because the incentives are offered on a per vehicle so-equipped basis, manufacturers are incentivized to apply game-changing technologies as broadly as market demand allows. Technologies with lower penetration rates will produce less credit than those with higher penetration rates. This approach also provides a level playing field for all manufacturers. Further discouragement of technologies based on penetration rates actually works against the intent of early adoption of game changing technologies. [EPA-HQ-OAR-2010-0799-9495-A1, p. 16]

Chrysler supports broad technology definitions for mild and strong HEV technology

Given the long-term timeframe of this rulemaking, Chrysler supports maximum flexibility in the definition of hybrid technology. [EPA-HQ-OAR-2010-0799-9495-A1, p. 16]

The definitions of mild and strong hybrids should not use technology-specific terms; Chrysler recommends that the term "mild hybrid vehicle" be used instead of "mild hybrid gasoline-electric vehicle" and "strong hybrid vehicle" be used in place of "strong hybrid gasoline- electric vehicle". [EPA-HQ-OAR-2010-0799-9495-A1, p. 16]

The agencies refer to mild and strong hybrid technologies which qualify for "game-changing" technology credits using the term "gasoline-electric". The use of this term implies that the only hybrid technology acceptable is a gasoline and electric powertrain combination. Not only are other fuels possible (e.g. E85, diesel, and CNG), but other "hybrid" types other than electric are also possible (e.g. hydraulic hybrids and flywheel energy storage systems). The agencies should strive for both fuel and hybrid technology neutrality in this rulemaking and provide this incentive to any system that can capture a minimum fraction of otherwise wasted energy and convert it to tractive power. [EPA-HQ-OAR-2010-0799-9495-A1, p. 16]

The required energy recovery rate definition for full-size strong hybrids should be reevaluated.

EPA proposes that a "strong" hybrid must recapture at least 75 percent of available braking energy over the Federal Test Procedure. This target may be appropriate for passenger cars, but is very aggressive for full-size trucks. For example, hybrid systems for full-size truck applications may have difficulty in meeting the proposed 75% energy recovery rate because of the need to design the braking system for maximum payload and trailer capability while maintaining drivability in the absence of these loads. Chrysler recommends reducing the requirement to 50%.

This value will help maintain the distinction between strong and mild hybrids, but recognizes some of the design constraints for large high-utility vehicle hybrid systems. [EPA-HQ-OAR-2010-0799-9495-A1, p. 16]

Performance-Based Incentive

Chrysler supports the tiered incentive system based on varying levels of over-performance.

The agencies propose to offer two levels of performance-based incentives, with a greater incentive offered for greater levels of performance. This methodology incentivizes manufacturers to maximize the fuel economy performance of full-size trucks and to take additional incremental steps if possible. [EPA-HQ-OAR-2010-0799-9495-A1, p. 17]

Chrysler supports the agencies' proposal to base the credit on over-performance in the first year of production.

The agencies propose to begin the performance-based incentive in the model year of introduction and to extend that incentive for up to five years. Chrysler agrees with this approach. Requiring the vehicle to make continuous improvements to maintain its original over-performance to a standard would not respect automotive design cycles and the resources required to make significant improvements. [EPA-HQ-OAR-2010-0799-9495-A1, p. 17]

Organization: Clean Energy

Advanced Pickup Truck Credits [EPA-HQ-OAR-2010-0799-9511-A1, p.6]

For 2017-2025, EPA and NHTSA have proposed special credits for pickup trucks. There is a credit for mild and also for strong-hybrid pickups, and a separate credit for pickups that are able to meet prescribed GHG reductions. The description in the proposed rule appears to indicate that hybrid pickups and pickups that satisfy the GHG performance criteria will earn GHG and FE credits. We recommend that the agencies also consider and include additional credits for dedicated, dual-fuel and hybrid NGV applications on pickup trucks. Clean Energy would be happy to work with the agencies to develop credits that fully recognize the benefits that natural gas can provide on these trucks. [EPA-HQ-OAR-2010-0799-9511-A1, pp.6-7]

Organization: Eaton Corporation

• Provides incentives to promote the adoption of advanced vehicle technologies that over comply with the targets set forth in the rule while not pre-selecting winners and losers in the marketplace. [EPA-HQ-OAR-2010-0799-9494-A1, p. 2]

The rule has the potential of accelerating adoption of game-changing technologies that otherwise would not have been adopted. However, we offer the following comments to recommend that the concept of 'technology neutral' is adhered to in the Light-Duty Truck Program. [EPA-HQ-OAR-2010-0799-9494-A1, p. 2]

'Game Changing' Technology Credits for light Duty Trucks

We applaud the inclusion of a credit program that includes mild hybrids. Mild hybrid technologies show great promise for cost-effective fuel consumption and GHG reductions. [EPA-HQ-OAR-2010-0799-9494-A1, p. 2]

Eaton recommends that the definition of hybrids and mild-hybrids under the 'Game Changing' Technologies for Full-Size Pick-up Trucks be technology neutral. The phrase 'gasoline-electric' is too narrow and would eliminate other non-battery internal combustion based technologies from being considered. All full-hybrid and mild-hybrid technologies should qualify for credits. Also, the penetration rate thresholds for full-size pick-up trucks should be significantly reduced or eliminated so that market and economic uncertainties do not prevent innovation from being introduced. [EPA-HQ-OAR-2010-0799-9494-A1, pp. 2-3]

Organization: EcoMotors International, Inc.

EPA is proposing CO_2 credits for manufacturers that hybridize a significant quantity of their full-size pickup trucks, and the agencies are also proposing that manufacturers be able to include 'fuel consumption improvement values' equivalent to EPA CO_2 credits in the CAFE program. Access to the incentives is conditioned on a minimum penetration of mild and strong hybrid electric vehicle (HEV) technologies in an OEM's full-size pickup truck fleet. [This comment can also be found in section 8 of this comment summary.] [EPA-HQ-OAR-2010-0799-9594-A2, p. 8]

EcoMotors endorses the agencies' incentives to promote the use of advanced vehicle technologies in both full-size and smaller size pick-up trucks. However, for all of the reasons noted above, other less-costly and equally energy efficient and environmentally beneficial vehicle technologies - available today - should be afforded equally beneficial regulatory incentives. Near-term development and commercialization of advanced ICEs, such as the dual-module opoc engine performing as a mechanical hybrid, remains an extremely important path for emissions reduction and fuel economy improvements in pick-up trucks and should also be encouraged by national policy. In a dual-module, mechanical hybrid configuration, the EM100 base opoc engine would provide fuel savings exceeding 45%. [EPA-HQ-OAR-2010-0799-9594-A2, p. 8]

EcoMotors believes that the market penetration requirements established for the hybridization incentives should be removed in the Final Rule. New technologies typically take years to prove themselves and attain significant market penetration. In the past, it has taken a decade for a technology to prove itself and attain a sales fraction of 40-50%, and has taken as long as another 5-10 years to reach maximum market penetration. Thus, establishing a 30% market penetration rate threshold for MY2017 (mild HEV pickups) is unrealistic. Even the 10% annual market penetration suggested for strong HEV pickups is problematic. It will likely be necessary to provide incentives to OEMs just to get within reach of these thresholds. [EPA-HQ-OAR-2010-0799-9594-A2, p. 8]

- Specific Recommendation: EcoMotors strongly encourages the agencies to extend CO_2 and fuel economy credits to OEMs that manufacture mechanical hybrid pick-up trucks, hydraulic hybrid pick-up trucks, and similar advanced technology hybrid pick-ups. This would place other significant, game-changing vehicle technologies -like the dual-module opoc engine - on a level playing field with HEVs. EcoMotors also encourages the agencies to completely eliminate the market penetration requirements established for the credits, to better reflect historic market penetration issues facing new technologies. [EPA-HQ-OAR-2010-0799-9594-A2, p. 8]

EPA is proposing performance-based incentive credits and equivalent fuel consumption improvement values for CAFE for full-size pickup trucks that achieve an emission level significantly below the applicable CO_2 target. The performance-enhancing technology must be used on a minimum percentage of a manufacturer's full-size pickup trucks. [EPA-HQ-OAR-2010-0799-9594-A2, p. 12]

EcoMotors strongly endorses this technology-neutral incentive to promote the use of advanced vehicle technologies in both full-size and smaller-size pick-up trucks. By establishing performance-based incentives, the agencies are enabling OEMs to choose their own cost-efficient path for achieving CO_2 reductions and fuel economy improvements, consistent with their specific product plans. [EPA-HQ-OAR-2010-0799-9594-A2, p. 12]

EcoMotors encourages the agencies to remove the market penetration requirements established for the credits, to better reflect historic market penetration issues facing new technologies. As discussed above, new technologies typically take years to prove themselves and attain significant market penetration. Thus, even the lowest rate associated with this incentive - 10% - is likely set too high for OEMs to secure these credits. [EPA-HQ-OAR-2010-0799-9594-A2, p. 12]

- Specific Recommendation: EcoMotors supports the agencies' performance-based incentive program for full-size pick-ups and encourages the agencies to extend it to somewhat smaller pickups as well. EcoMotors encourages the agencies to remove the market penetration requirements established for the credits in order to better reflect historic market penetration issues facing new technologies. [EPA-HQ-OAR-2010-0799-9594-A2, p. 12]

Organization: Encana Natural Gas Inc.

Advanced Pickup Truck Credits

For 2017 - 2025, the EPA and NHTSA have proposed special credits for pickup trucks. There is a credit for mild and also for strong hybrid pickups, and a separate credit for pickups that are able to meet prescribed GHG reductions. The description in the proposed rule appears to indicate that hybrid pickups and pickups that satisfy the GHG performance criteria will earn GHG and FE credits. [EPA-HQ-OAR-2010-0799-9585-A2, p. 6]

First, we offer the following comments with respect to the hybrid credits. like other credits proposed in the rulemaking, the mild and strong hybrid credits are not tied to specific GHG or FE performance metrics but rather attempt to incentivize a specific type of technology in order to encourage manufactures to sell such vehicles. Encana recommends an approach that regulates all alternative fuel technologies equally. In order to provide equitable treatment, the proposed rule should provide similarly strong incentives for NGVs. We have outlined the types of incentive we believe are necessary to encourage the development and sale of light duty NGVs. Encana believes that it is appropriate to provide incentives like those proposed for hybrid trucks as long as similarly strong incentives are provided for other technologies. [EPA-HQ-OAR-2010-0799-9585-A2, p. 6]

Second, with respect to the performance-based credits provided for pickup trucks, we offer the following comments. We agree that all technologies should have the opportunity to earn credits under this provision. Also, we believe that, if specific credits are provided elsewhere in the rules for NGVs, that such vehicles, like hybrids, should not earn double credits under those provisions and also under the pickup truck credit provision. If no additional credits, as described earlier in our Public Comment letter, are provided for NGVs, then they should have the potential to earn credits under the Advance Pickup Truck Credits provisions. [EPA-HQ-OAR-2010-0799-9585-A2, p. 6]

We also believe that targets for introduction are simply too high with respect to NGVs and that the EPA and NHTSA should amend the proposal to provide a lower-threshold. In the Proposed Rule, the EPA and NHTSA provide a 10 g/mi GHG credit if advanced pickup truck production is at least 15% of a company's full sized pickup production in MY 2017 with a ramp up to at least 40% in MY 2021. Additionally, a 20 g/mi credit is provided if advanced pickup truck production is at least 10% of a company's full sized pickup production in each year over the model years 2017-2025. These proposed production goals are unattainable for NGVs and simply precludes NGVs from receiving this incentive. [EPA-HQ-OAR-2010-0799-9585-A2, p. 6]

The US Energy Information Administration - AEO 2011 projects sales of alternative fueled vehicles[2]. At no time during the 2017·2025 time period does the EIA project light truck sales to exceed even 0.1% of total new light truck sales (sic). Encana proposes that there should be no production minimum for MYs 2017 through MY 2020. For MYs 2021 and beyond, a meaningful stretch goal would be 0.5% of production. [EPA-HQ-OAR-2010-0799-9585-A2, pp. 6-7]

Encana appreciates the opportunity to provide public comment on this rulemaking. Encana requests that the EPA and NHTSA incorporate the additional incentives described in this letter for natural gas vehicles. The following summarizes the additional incentives Encana believes will provide fair and equitable treatment of NGVs: [This comment can also be found in section 6.2 of this comment summary] [EPA-HQ-OAR-2010-0799-9585-A2, p. 7]

• Modify the Advanced Pickup Truck Credit provisions to include NGVs. [EPA-HQ-OAR-2010-0799-9585-A2, p. 7]

[2]http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2011&subject=0-AEO2011&table=48-AEO2011®ion=1-0&cases=ref2011-d020911a

Organization: Ford Motor Company

- Auxiliary transmission oil coolers
- Upgraded radiators
- Trailer hitch connectors and wiring harness equipment
- Different steering ratios, upgraded rear bumpers and different springs for heavier tongue load (for upgraded 'max' trailer tow packages)
- Body on frame (vs. unibody) construction to support capability and an aggressive duty cycle
- Lower axle ratios for better pulling power/capability [EPA-HQ-OAR-2010-0799-9463-A1, p. 9]

In addition, vehicles with towing capability generally have increased aerodynamic drag caused by a modified frontal area, increased rolling resistance, and a heavier frame and suspension to support this additional capability. [EPA-HQ-OAR-2010-0799-9463-A1, p. 9]

We are seeing a continuing trend that our customers are purchasing these vehicles for work purposes. Based on 2011 segmentation models for our full size pick-up trucks, Business users account for approximately 30% of the market. The Business category includes fleet and work trucks (e.g. small business owner, farmer, foreman), as well as those customers who use their truck for occupational purposes during the week and personal use on the weekend. About 58% of the market is comprised of Recreational users, including hunters, boaters, fisherman, etc. These consumers rely on their vehicles for hauling and towing to support their recreational activities. Only a relatively small segment (12%) of the market is comprised of consumers who do not make significant use of the towing/ hauling/off-road capabilities of the truck. Based on the trends we have seen in the market, we fully anticipate that such buyers will continue to be a shrinking portion of our market. We believe that within a few years, the Business category will increase to over 40% of the market, and the combined Business/Recreational users will increase to over 90% of the market for full size pick-up trucks. [EPA-HQ-OAR-2010-0799-9463-A1, p. 9]

And to further demonstrate the importance of these vehicles to the American economy, the following graph demonstrates that new home construction, a key financial indicator, and the sales of the trucks needed to help this industry, go hand in hand. [EPA-HQ-OAR-2010-0799-9463-A1, p. 9]

Game Changing Technologies for Full Size Pick-up Trucks

Ford supports the agencies' proposal to provide additional "game changing technology" incentives for full-size pick-up trucks. We agree with the agencies' statement that this incentive

"…provides the opportunity to begin to transform the most challenging category of vehicles in terms of the penetration of advanced technologies, which, if successful at incentivizing these ''game changing technologies,'' should allow additional opportunities to successfully achieve the higher levels of truck stringencies in MYs 2022–2025." (76 Fed. Reg. 74879) [EPA-HQ-OAR-2010-0799-9463-A1, p. 21]

As noted previously, weight-based vehicle attributes such as payload and towing capability are key among the parameters that characterize differences in the design of these work vehicles, as well as differences in how the vehicles will be utilized. Vehicles with towing capability generally have increased aerodynamic drag caused by a modified frontal area, increased rolling resistance, and a heavier frame and suspension to support this additional capability. Manufacturers are faced with the challenge of applying technologies to significantly improve fuel economy without sacrificing the utility required by our customers. [EPA-HQ-OAR-2010-0799-9463-A1, p. 21]

- Pick-up Truck Definition: The current proposal for cargo box size, towing capability and payload capability encompasses the majority of full-size pick-up trucks on the road today. While it is difficult to forecast future customer needs and expectations for vehicles that we will be building 10 years from now, Ford believes the proposal incorporates the appropriate size and work factor related attributes to define a full-size pickup truck. [EPA-HQ-OAR-2010-0799-9463-A1, pp. 21-22]
- Hybrid Electric Vehicle Pick-up Truck Definition: Ford supports the proposed performance-based definitions for both mild and strong HEV pick-up trucks, which provide manufacturers flexibility in technology deployment, taking into consideration customer expectations, while still providing the anticipated efficiency benefit. We also support the comments provided by the Alliance on proposed changes to 40 CFR § 600.116-12 for determining the proportion of recovered braking energy for hybrid electric vehicles. However, in addition to those recommendations, we also believe the definition of a strong hybrid should be expanded beyond the currently proposed energy recovery methodology, which does not allow braking energy to be easily segregated from other battery charging sources, such as the engine. As proposed, we believe there is a potential for gaming that could allow a mild hybrid to qualify as a strong hybrid. Also, the level of capture of regenerative energy is only one of the important functional elements delivered by a strong hybrid system. As such, Ford recommends the following improvements to the proposed methodology, including the addition of a new metric, fedrive, the fraction of electric driving. [EPA-HQ-OAR-2010-0799-9463-A1, p. 22]

1. Calculate E_{rec} using the proposed formula, only during deceleration.
2. Calculate E_{brake_max} using the proposed formula, from the measured speed trace, in lieu of using the scheduled speed trace.
3. Calculate the energy recovered percentage using the values from (1) and (2), as proposed.
4. Calculate a new metric, the percent fraction of electric drive, $f_{edrive,}$ using the formula:

$$f_{edrive} = 100 \times \frac{E_{e-tractive, P_{accel}>0}}{E_{tractive, P_{accel}>0}}$$

$E_{tractive,\ Paccel>0}$, the total tractive energy under positive acceleration conditions is equal to the sum over the FTP cycle of the absolute values of P_{accel}+$P_{roadload}$ for the condition P_{accel}>0 divided by 36,000 and rounded to the nearest 0.01 kW-hr.

$E_{e\text{-}tractive}$, $P_{accel>0}$, the total electric drive tractive energy under positive acceleration conditions is equal to the sum over the FTP cycle of the absolute values of $P_{accel}+P_{roadload}$ for the conditions $P_{accel}>0$ and engine speed = 0 divided by 36,000 and rounded to the nearest 0.01 kW-hr.

To qualify as a strong hybrid, Ford recommends that the following thresholds be used:

Energy Recovered % ≥ 40%
$f_{edrive} \geq 10\%$

[See calculations on p. 22 of Docket number EPA-HQ-OAR-2010-0799-9463-A1]

Based on the recommended change to measure E_{rec}only during deceleration, only braking energy will be included in the calculation, as opposed to including energy from the engine or other sources. As a result of this procedural revision, the threshold to qualify as a strong hybrid must be reduced. Ford believes that 40% is an appropriate level for full size pickup trucks because the higher weight of such vehicles and rear wheel braking stability constraints will limit braking energy recovery potential. In addition, wheel-to-traction motor losses will be larger for feasible full size pick-up truck strong hybrid system architectures compared with smaller front wheel drive passenger cars. We also believe setting the fedrive metric at 10% should allow all applicable strong hybrids to achieve the credit, but would prevent any mild hybrid from being able to meet that target. [EPA-HQ-OAR-2010-0799-9463-A1, p. 23]

Further, from a technical perspective, certain sections of the proposed regulation were written in an inconsistent manner. 40 CFR § 600.116-12(c)(3)(ii) and (iii) reference a confusing mix of incompatible units (e.g. "…current in Watt hours…" "….the total *energy* recovered by the hybrid battery system, in kilowatt hours, is the sum of the positive *current* values…"). The equation given for dSOC is also incorrect. The equation as shown represents change in energy, not state of charge. Further, battery current in A is measured directly in the test, not state of charge (SOC). [EPA-HQ-OAR-2010-0799-9463-A1, p. 23]

To correct this, we recommend revising 40 CFR 600.116-12(c)(3)(ii) to specify clearly that the recovered braking energy should be determined from an integration of the battery charge power during decelerations over the course of the drive cycle where the battery charge power is the product of measured current and voltage at the battery terminals, i.e.: [See calculation on p. 23 of Docket number [EPA-HQ-OAR-2010-0799-9463-A1]

In addition, for nominal voltage, Ford requests that the definition of "nominal" be published within the regulations to avoid confusion and the usage of differing methodologies for its determination. [EPA-HQ-OAR-2010-0799-9463-A1, p. 23]

As noted above, the specific technical details of the voltage and current measurements and the subsequent calculations with consistent units need to be worked out with appropriate industry and EPA technical experts. The goal will be to define test procedure specifications and regulatory language for determining the recovered braking energy that are clear, accurate, and consistent with previous hybrid procedural guidance (e.g. SAE J1711, Part 86, Part 600). Ford plans to discuss these recommendations with the agencies in more detail and would be happy to provide additional input to help develop the procedure and appropriate metrics for this important regulatory flexibility. [EPA-HQ-OAR-2010-0799-9463-A1, p. 23]

- Performance Based Incentives: Other technologies are available beyond hybridization to provide game changing greenhouse gas reduction and fuel economy improvement, for full-size pick-up trucks. The performance based incentive offers a technology neutral alternative to pursue these other strategies. The provision of the 5 model year carry-over of the credit will encourage earlier adoption of these technologies. [EPA-HQ-OAR-2010-0799-9463-A1, p. 23]
- Incentive Levels: The proposed incentive levels are aligned with the anticipated development and implementation costs, as well as the expected benefits, associated with implementing game-changing technologies on the full-size pick-up trucks. [EPA-HQ-OAR-2010-0799-9463-A1, p. 24]
- Minimum Penetration Thresholds: The thresholds proposed pose a significant concern. The intent of the credit is to drive advanced technologies that are typically more challenging in heavy truck applications, giving manufacturers the opportunity to gain experience with these applications and giving consumers the chance to become more accustomed to certain advanced technologies in pickup trucks. As these are achieved, the expectation is that the technology penetrations will increase and high fuel efficiency can be affordably implemented amongst the heavier trucks. [EPA-HQ-OAR-2010-0799-9463-A1, p. 24]

However, the aggressive, minimum penetration rates actually thwart that attempt. First, because significant early investment is required to develop and implement the “game changing technologies”, manufacturers will need the certainty that the credit will be achievable when the product goes to market. The uncertainty of the market acceptance, and affordability of the subsequent products make it difficult, if not impossible, to establish the necessary assurance that there will be a return on investment. If, for example, we plan on a 10% market penetration of full size hybrid pick-up trucks, but external conditions result in a 9% acceptance rate, our investment will not have yielded the anticipated credit and could threaten an otherwise compliant strategy. [EPA-HQ-OAR-2010-0799-9463-A1, p. 24]

Similarly, the aggressive year over year increases in the fleet thresholds for mild hybrids and performance based technologies do not align with typical product plans and strategies. For example, a particular truck platform/engine may be better suited for the application of the game changing technology, but requiring large year over year volume increases would require those same technologies applied to a broader range of products – some or many of which may not be suited to those particular advanced technologies. Again, without assurance that the credits can be achieved, the decision to proceed with the development of these game changing technologies may not be supportable in a sustainable business strategy. [EPA-HQ-OAR-2010-0799-9463-A1, p. 24]

Organization: General Motors Company

GM supports the proposed methodology to incentivize hybridization of pickup trucks. Additional supporting information and some technical suggestions are provided in the Appendix of these comments. [EPA-HQ-OAR-2010-0799-9465-A1, p. 3]

Pickup Truck Credits

General Motors supports the agencies' proposal to provide additional "game changing technology" credits for pickup trucks. We agree with the agencies' assessment, as noted in the Technical Support Document, that the proposed standards are most challenging to the larger trucks. Consumers use these vehicles for a wide variety of work purposes and expect them to provide durability and reliable towing and hauling capability. [EPA-HQ-OAR-2010-0799-9465-A1, p. 6]

Weight-based vehicle attributes such as payload and towing capability are key among the parameters that characterize differences in the design of these work vehicles, as well as differences in how the vehicles will be utilized. Vehicles with towing capability generally have increased aerodynamic drag caused by a modified frontal area, increased rolling resistance, and a heavier frame and suspension to support this additional capability. Manufacturers are faced with the challenge of applying technologies to significantly improve fuel economy without sacrificing the utility required by our customers. The incentives proposed by the agencies will encourage the development of innovative and more expensive technologies, to achieve breakthroughs in fuel consumption improvement on these products. These credits are consistent with the agencies' objectives to foster new and cost-effective technologies to achieve environmental benefits. [EPA-HQ-OAR-2010-0799-9465-A1, p. 6]

Pickup Truck Box Definition

As discussed in the draft Joint TSD (Section 5.3.1) as well as the Section III of the NPRM, EPA is seeking comment on expanding the scope of the hybridization credit to slightly smaller pickups (with a minimum distance between the wheel wells of 42 inches), provided they have the towing capabilities of the larger full-size pickups (for example a minimum towing capacity of 6,000 pounds). GM agrees with EPA that this could incentivize hybridization on pickups which offer much of the utility of the larger pickups, but overall have lower CO_2 emissions. GM agrees that providing an advanced technology incentive credit for a slightly smaller boxed, but greater towing capacity vehicle, would promote the overall objective of the proposed standards. [EPA-HQ-OAR-2010-0799-9465-A1, p. 6]

Pickup Truck Utility Definition

The current proposal for towing capability and payload capability include the key parameters to define a work vehicle and are appropriate. While it is difficult to forecast future customer needs and expectations for vehicles that we will be building 13 years from now, GM supports the agencies reliance upon utility-adding features such as towing or payload capability and agrees with the agency's direction to set these thresholds at a level representing significant utility capability. Further, we believe that the methodology for calculating the appropriate parameters should be tied to SAE J2807. It is also appropriate for these parameters to be evaluated at the mid-term review. [EPA-HQ-OAR-2010-0799-9465-A1, p. 6]

Hybrid Electric Vehicle Pickup Truck Definition

GM supports the proposed hybrid system definitions for both mild and strong HEV pickup trucks. We believe they are technically sound and reasonable. [EPA-HQ-OAR-2010-0799-9465-A1, p. 7]

Minimum penetration thresholds

The purpose of the "game changing" incentive provisions in the proposed rule is to encourage early introduction of advanced technologies. However, the proposed minimum volume thresholds for mild hybrid incentives are overly aggressive and may well significantly out-pace market demand for these technologies. The proposed minimum penetration rates for mild hybridization are not aligned with a historic rate of customer acceptance of any new and/or advanced technology. An alternative minimum penetration rate for mild hybrid incentives, which is still quite aggressive, but more respectful of historic technology penetration phase-in rates, is that which EPA proposed for the performance based incentives in Section II. F. 3 of the proposal on page 74,945. [EPA-HQ-OAR-2010-0799-9465-A1, p. 7]

GM recommends that the agencies harmonize the mild hybrid incentive rates with those proposed for the performance based incentives. Further, GM recommends that both the incentive level and the appropriate penetration rates be evaluated at the mid-term review. [EPA-HQ-OAR-2010-0799-9465-A1, p. 7]

Organization: Honeywell Transportation Systems

The agencies have proposed various incentive programs. Credits for hybridizing full-size pickup trucks are also proposed. The truck program also includes an incentive applicable to full-size pickup trucks where a credit of either 10 g/m (0.001125 gal/m) or 20 g/m (0.002250 gal/m) applies to those vehicles achieving 15 percent or 20 percent better CO_2 performance than their footprint based target once a fleet penetration target is reached. [EPA-HQ-OAR-2010-0799-9474-A1, pp.4-5]

Should the agencies finalize any of the proposed incentives for electric drivetrains, the agencies should also include an incentive for ICE vehicles that achieve substantially better CO_2 performance than their footprint based target as measured by the fuel economy test cycles. For purposes of this incentive, Honeywell suggests that micro-hybrid technology such as start/stop technology not preclude application of the incentive since that technology is available for an off-cycle credit regardless of the applicable drivetrain.4 The agencies have offered as much as 10 g/m for adding off-cycle technologies to vehicles. An OEM should similarly be able to obtain 5 or 10 g/m (and the equivalent value in the CAFE program) for ICE vehicles that perform 15 percent or 20 percent better than their applicable footprint-based target. [EPA-HQ-OAR-2010-0799-9474-A1, p.5]

An incentive for high performing ICE vehicles would encourage manufacturers to improve their vehicles beyond what is necessary for compliance alone and would help to detract from any reliance on the EV credit multipliers for fleetwide compliance. In addition, further improvements made in an effort to gain these credits can proliferate beyond the individual vehicle and, as a result, improve the performance of the fleet overall. [EPA-HQ-OAR-2010-0799-9474-A1, p.5]

The performance credit proposed for full-size pickup trucks presents a model to promote technology neutrality in the remainder of the fleet as well. [EPA-HQ-OAR-2010-0799-9474-A1, p.5]

Organization: Hyundai America Technical Center

The agencies have provided two incentives for full size pick-up trucks recognizing it will be challenging for manufacturers of these vehicles to meet the proposed targets and because they want to incentivize 'game-changing' technologies. One is a technology-based CO_2/mpg credit for manufacturers that hybridize full-size pick-ups. The other is a performance-based CO_2/mpg credit for full size pick-up trucks that exceed their applicable target. Hyundai supports technology-neutral and performance-based incentives for large pick-up trucks. However, Hyundai questions the need for both types of incentives as we believe the performance-based incentives achieve the same objective as hybridization incentives. Additionally, Hyundai asks that the agencies consider extending the performance-based incentives for pick-up trucks to all classes of vehicles. If the agency truly wants to incentivize performance and 'game changing' technologies, it makes sense that the agency would support game-changing technology for any class of vehicle. [EPA-HQ-OAR-2010-0799-9547-A1, p.3]

Starting in MY 2017, if a full-size pickup truck achieves either a 15 or 20% fuel efficiency/GHG improvement, the agencies will provide credits equivalent to approximately 2 mpg or 4 mpg, respectively. The 4 mpg credit would be available from MY 2017 through 2025 as long as the fuel efficiency of the first year is maintained. In addition to maintaining the first year's fuel efficiency over the entire nine year period in order to be eligible, Hyundai suggests that the agencies also consider the possibility of fuel efficiency/GHG improvement during that period. (The current proposal requires only increased penetration rates of the fuel efficiency/GHG improvement for a model) Additionally, Hyundai notes that if automakers are capable of exceeding large truck fuel efficiency targets by 15 or 20%, this will be valuable information to the agencies at the time of the mid-term review. [EPA-HQ-OAR-2010-0799-9547-A1, p.3]

Finally, while we support performance-based incentives, we do acknowledge that it is possible that these incentives could shift the fleet mix toward the full-size truck segment, thus reducing the overall benefits of the proposed requirements. [EPA-HQ-OAR-2010-0799-9547-A1, p.3]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 173.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 23.]

Others are improving the fuel efficiency of cargo-carrying larger pickup trucks, and the agency is providing incentives to provide that technology.

Organization: International Council on Clean Transportation (ICCT)

14. Similarly, the full-size pickup truck credits also violate the principle that efficiency and greenhouse gas standards should be technology neutral, and reduce the benefits from the rule. As a minimum, the credits should only be given if the sales targets are met each year and the credits should be phased out in the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 4]

15. Full-size pickups have been defined by the ability to fit four foot wide construction materials between the wheel wells at least since the introduction of the F-series pickup in 1948. The full-size pickup truck credits should not be expanded to pickups with less than 48 inches wheelhouse width. [EPA-HQ-OAR-2010-0799-9512-A1, p. 4]

14) Pickup Truck Credits

A second type of technology-specific bonus credit currently in the proposed rule applies to full-size pickup trucks. For the same reasons we expressed in the last section on upstream credits, the ICCT encourage US EPA to eliminate the proposed bonus credits for pickup trucks. [EPA-HQ-OAR-2010-0799-9512-A1, p. 35]

The NPRM proposes two types of pick-up bonus credits. First, the NPRM proposes a bonus credit of 10 g/mile for each full-sized pickup truck that is either equipped with mild hybrid technology, or achieves an emission rate 15% better than the standard in any year from MY2017 to MY2021 (assuming minimum fleet deployment rates are met). Second, the NPRM proposes a bonus credit of 20 g/mile for each full sized pickup that is either equipped with strong hybrid technology, or achieves an emission rate 20% better than the standard in any year (assuming certain fleet deployment rates are achieved). [EPA-HQ-OAR-2010-0799-9512-A1, p. 35]

These proposed credits are not related to any additional fuel or CO_2 reductions and could hinder, rather than promote, additional technology advancement for two reasons. First, there is no inherent reason why hybrid systems for pickup trucks would be different from hybrid systems for other vehicles. Even if hybrid development proceeded initially on other vehicles, it could easily be spread to pickup trucks when it is ready. In fact, Toyota and Ford have already announced a joint venture to develop hybrid systems for pickup trucks.[65] [EPA-HQ-OAR-2010-0799-9512-A1, p. 35]

Second, OEMs could use the bonus credit to delay introducing this technology on other models and/or delay introduction of stronger hybrids, zero tailpipe emission vehicles, and other superior technologies. In addition, once a vehicle qualifies in a given year, future production of the model can also qualify for the 10 g/mile credit up until 2021, even as the expected benefit over the standard shrinks toward zero. [EPA-HQ-OAR-2010-0799-9512-A1, p. 35]

Technology-neutral standards, without the 10 g/mile and 20 g/mile pick-up credits, would best achieve the valuable benefits of this rulemaking. [EPA-HQ-OAR-2010-0799-9512-A1, p. 35]

As a minimum, OEMs should be required to achieve a performance standard of 15% (10 g/mile credit) or 20% (20 g/mile credit) better than the compliance curve for a given model in each year that the credit is awarded to that model. In addition, the pickup truck credits should be phased out in the final rule and not be allowed to continue indefinitely. [EPA-HQ-OAR-2010-0799-9512-A1, p. 36]

15) Pick-up Truck Definition

For the purposes of the full size pickup truck hybrid technology incentive credit or the full size pickup truck performance-based incentive credit, EPA is seeking comment on expanding the definition of a full-size truck by reducing the minimum wheelhouse width requirement from 48 inches to a value around 42 inches, provided the vehicle is able to tow at least 6,000 lbs. Note that this is 1,000 lbs higher than the requirement for 48 inch wide pickup trucks. [EPA-HQ-OAR-2010-0799-9512-A1, p. 36]

It is inappropriate to expand the definition of full size pickup trucks to include trucks with less than 48 inches between the wheelhouse. The ability to haul standard four foot wide building sheets, such as plywood and drywall, between the wheelhouse has been the marketing definition of a full size pickup at least since the introduction of the F-series pickup in 1948. Reducing the wheelhouse width to 42 includes will allow virtually all pickup trucks to qualify for the artificial pickup truck credits, further distorting technology requirements and reducing the benefits of the rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 36]

ICCT strongly opposes expansion of the full size pickup credits to pickups with less than 48 inches wheelhouse width. [EPA-HQ-OAR-2010-0799-9512-A1, p. 36]

---

65 http://www.nytimes.com/2011108123IbusinessIford-and-toyota-to-work-together-on-hybridtrucks.html

Organization: Marz, Loren C.

However, I do not support the 'Incentives for Advanced Technologies Including Hybridization for Full-Size Pick-Up Trucks' unless diesel technology is also included in some fashion. [NHTSA-2010-0131-0213-A1, p.1]

Organization: Mercedes-Benz USA, LLC

• DAG supports credits applicable to the hybridization of vehicles with footprints less than 40 square feet. Additional credit opportunities would provide significant assistance in overcoming the cost-benefit barriers to investment in hybrid powertrains in this market segment. [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

DAG proposes that EPA provide a further credit to assist manufacturers in hybridizing smaller vehicles, i.e., those 40 square feet or less. This category would currently include approximately

14 vehicles, including the smart car, the Mini Cooper, the Ford Fiesta and the Toyota iQ.[29] Only Honda is offering hybrid vehicles in this size category.[30] [EPA-HQ-OAR-2010-0799-9483-A1, p. A-15]

Vehicles within this category generally achieve EPA-combined fuel economy in the range of 30-35 mpg, primarily by virtue of their size and weight. In comparison, however, hybridization is more cost-effective for vehicles in larger segments. Larger vehicles with hybrid engines, such as the Prius and the Honda Civic hybrid, achieve substantially greater EPA-combined fuel economy, in the range of 40-50 mpg. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-15]

For small-size cars, however, the barriers to hybridization include architecture and cost impediments to hybridizing smaller vehicles.[31] Indeed, press reports indicate that while companies have explored hybridizing in this category; as of yet, however, only Honda has thus far decided to offer hybrid vehicles in this segment. The vast majority of companies appear to have determined that it is not commercially feasible to hybridize in this category. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-15]

Hybridizing this market segment, however, could garner significant benefits. The fuel efficiencies of smaller vehicles are generally associated with steady state driving, mostly on highways and in rural areas. The power-to-weight ratio of vehicles in this class are typically 15-20% worse than the next larger vehicle class. As a result, fuel efficiency in fact suffers in smaller vehicles when driven in urban settings because in that setting they are being driven outside their most fuel-efficient envelopes. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-15]

Urban city modes tend to impose greater transient demands on the engine. On urban expressways, extended higher-rpm acceleration is often required. Hybrid vehicles offer the opportunity to enhance fuel efficiency by supplanting, with hybrid propulsion, the power required for acceleration which would otherwise occur at a less than optimum efficiency. Outside of urban areas, the hybrid propulsion can serve as a range extender during steady state cruising to supply power at times, such as long grades, that would otherwise require the engine to operate at less than optimal fuel consumption. As a result, hybridizing smaller vehicles would offer substantial fuel efficiency gains and CO_2 reductions while providing enhanced consumer functionality in both urban and highway settings. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-15]

DAG proposes a credit of 10 g/m, consistent with the credit proposed for hybridizing larger trucks, for hybrid vehicles in this class once a penetration rate of 10% is reached. The application of a penetration rate recognizes that there may be individual companies that are able to invest in particular models, but that for most manufacturers investment in this segment is not feasible or likely to provide enough benefit to justify the costs. A 30% penetration rate ensures that the incentive is in fact encouraging investment. A substantially higher penetration rate requirement would render the incentive infeasible. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-15-A-16]

29 The category would also include the Chevrolet Aveo, the Fiat 500, the Toyota Yaris, the Mazda2, the Honda Fit, the Hyundai Accent, the Kia Rio, the Ford Fiesta, the Scion xD and the Chevrolet Spark 2013. The list is based on EPA's 'small size' car list for MY 2012.

30 Honda currently offers the hybrid CR-Z and has announced plans to offer the hybrid Honda Fit. We do not believe other companies will follow in the absence of a government production incentive to do so. The Mitsubishi i-MiEV also falls within this size range, but is a full electric vehicle.

31 Hybridization in this context should refer to regenerative braking and/or electric motor drive assist.

Organization: Motor & Equipment Manufacturers Association (MEMA)

Incentives for “game changing” technologies performance for full-size pickup trucks including hybridization is too limiting and requires revisions. These incentives should not be limited to this vehicle segment. Also, incentive metrics for hybrids need to be based on vehicle performance, not architecture; other technical possibilities for full-size pickup truck hybrids should be considered; and, the penetration rate requirement should be eliminated. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

Essentially, any technology that is “game changing,” as stated in the NPRM, should qualify for the same incentives. The quantification of significant improvement is a reasonable definition of “game changing,” and should therefore apply to any technology and vehicle segment. No one vehicle segment should be the beneficiary of “game-changing” technologies. Such focus on one segment could also have unintended consequences. As a hypothetical example, if the OEM concentrates their efforts on full-size pickup trucks and thereby generates a large number of credits, there is a possibility they may not apply advanced technologies to large SUVs. Instead, they may use those credits from the pickup trucks to offset their SUVs that do not meet the standard. Thus, the overall effect on emissions and fuel consumption goes in the wrong direction. [EPA-HQ-OAR-2010-0799-9478-A1, p.3]

Second, with respect to full-size it is our understanding, that if full-size pick-ups demonstrate a 15 or 20 percent performance improvement pre-MY2017 (i.e. during MYs2014, -15, -16) then those vehicles would not be eligible to be pulled through as a carry-forward credit in the form of a full-size pick-up performance improvement credit post-MY2017. Under this scenario, MEMA asks that the agencies clarify if these full-size pickups would instead be eligible for an early compliance credit. This important point needs to be clarified primarily because the multiplier for early credit and the performance improvement credit for this vehicle class would be different (flat 1 versus 1.5). If these pickups would not be eligible as a performance improvement credit and carried forward as such, then there may not be as large of an incentive to research, develop, produce and implement technologies more rapidly. [EPA-HQ-OAR-2010-0799-9478-A1, pp.9-10]

A. “Game Changing” Technologies Should Apply to All Vehicle Segments [EPA-HQ-OAR-2010-0799-9478-A1, p.10]

As MEMA stated earlier in Section II, the credits for “game changing” technologies should not be limited to just full-size pickup trucks. Any technology that is “game changing” should qualify for the same incentives and have the same hurdles to meet. No one, single segment should be the beneficiary of “game changing” technologies. For example, systems like Higher Voltage Stop-Start/Belt Integrated Starter Generator (BISG), can be utilized in other vehicle categories. If there is a technology that improves any vehicle segment by a given percentage or target (performance-based criteria) and subsequently the criterion is exceeded, then an incentive/credit should apply across the board. [EPA-HQ-OAR-2010-0799-9478-A1, p.10]

By making this change, these “game-changing” technologies can be implemented to other vehicles, such as large SUVs. In many ways, large SUVs face some of the same challenges as full-size pickup trucks. It would be prudent for the agencies to treat all vehicle segments equally so that the rule does not drive certain types of vehicles to be made available to consumers. Such a constraint not only influences and favors vehicle “winners and losers” and prescribes a technology pathway, but also influences the offsets for those vehicles that may not meet the standard. This direction is counter to the intent of the Program’s goals. All opportunities to improve real-world emissions and fuel consumption should not be limited exclusively to any one vehicle segment. Therefore, MEMA urges the agencies to consider applying “game changing” performance-based improvements to all vehicle segments and not just full-size pickup trucks. [EPA-HQ-OAR-2010-0799-9478-A1, p.10]

B. Mild and Strong Hybrids Should be Based on Vehicle Performance, Not Architecture [EPA-HQ-OAR-2010-0799-9478-A1, p.10]

If the agencies will not apply “game changing” technologies to all vehicle segments, MEMA urges that changes are made to the treatment of mild and strong hybrids in the rule. In the NPRM, hybrid electric vehicles have been categorized as “mild” or “strong” in a manner based more on hybrid architecture than on any specific performance definition. There are many different architectures employed using single, dual, or multiple electric motors performing various functions including traction drive, power generation (both while driving and braking), and battery charging. These electric drive systems cover a continuum of power levels.[EPA-HQ-OAR-2010-0799-9478-A1, p.10]

In real-world driving, regenerative braking efficiencies can be similar for both mild and strong hybrids when the driver coasts to a stop. A strong hybrid is capable of a higher regenerative braking level and the vehicle will coast to stop sooner. Thus, the regenerative braking efficiency is not a representative metric when classifying mild or strong hybrids. It is recognized that when following a defined deceleration rate on a specific driving cycle there will be differences in regenerative braking energy levels between mild and strong hybrids. [EPA-HQ-OAR-2010-0799-9478-A1, p.10]

If regenerative braking efficiency is used as a metric for incentives, then vehicle manufacturers will focus on this and not the goal of maximizing fuel efficiency at an affordable cost. An architecture that could maximize regenerative braking efficiency and meet the 75 percent breakpoint is one that uses four-wheel motors. This is unlikely to be used in mass-market vehicles due to the high cost of implementation. On a full-size pickup truck with rear-wheel drive, optimum regenerative braking could use an electric motor on the front axle, commonly referred to as a "through-the-road" hybrid. Typical vehicle braking is done with 70 percent on the front and 30 percent on the rear, which also provides stability under braking. [EPA-HQ-OAR-2010-0799-9478-A1, p.11]

Hybrid architectures for large pickup trucks – both mild and strong – more typically provide electrical boost through the drivetrain to the rear wheels. This configuration is able to employ regenerative braking on the rear and friction braking on the front to retain vehicle safety and stability. In this architecture the system is incapable of meeting a 75 percent regenerative braking efficiency, as defined in the NPRM, whether or not it is a mild or strong hybrid. Drivetrain losses and engine pumping losses also reduce the amount of recovered energy. [EPA-HQ-OAR-2010-0799-9478-A1, p.11]

For these reasons, MEMA urges that the calculated incentive be based on vehicle performance (i.e. the improvement in fuel efficiency of the hybrid compared to a conventional vehicle) and using a formula that provides a continuous value that does not require a breakpoint and a definition of "strong" versus "mild." MEMA further recommends that this incentive is calculated using the "Autonomie" modeling and simulation program developed by Argonne National Laboratory. This program is widely recognized for its ability to model different architectures to determine vehicle performance, including fuel efficiency. [EPA-HQ-OAR-2010-0799-9478-A1, p.11]

In this same section, § 86.1866–12 (e) Paragraph (2) (i) and (ii), the proposal defines penetration rate thresholds for full-size pickup trucks.[11] Based on current penetration rates of light-duty hybrid vehicles of 2.4 percent in 2010 and 2.2 percent in 2011, the proposed threshold penetration rates are unlikely to be achieved. Further, there is close correlation between the number of hybrid vehicles sold and the price of gasoline. MEMA recommends that the penetration rate thresholds be eliminated because these factors are impossible to predict. Therefore, the credit should be given according to the actual number of vehicles actually produced. [[EPA-HQ-OAR-2010-0799-9478-A1, pp.11-12]

Incentives for "game-changing" technologies should available to all vehicle segments, not just full-size pickup trucks. [EPA-HQ-OAR-2010-0799-9478-A1, p.13]

Metrics and terminologies for hybrids should be modified. [EPA-HQ-OAR-2010-0799-9478-A1, p.13]

Organization: National Wildlife Federation (NWF)

NWF supports provisions in the rule that encourage more rapid adoption of the most fuel efficient technology at scale – especially the incentive for "game changing" technologies for full size pickup trucks. [EPA-HQ-OAR-2010-0799-9887-A2, p. 4]

In principle, we also support incentives for plug-in hybrid electric and electric vehicle technology and for real off-cycle CO_2 reductions, and we look forward to continuing to work with automakers, the agencies and consumers to maximize the effectiveness of these credits and other measures which enable rapid adoption of new technology, and to optimize short and long term emissions impacts. [EPA-HQ-OAR-2010-0799-9887-A2, p. 4] [[This comment can also be found in Outline Headings 4. and 7.]]

Organization: Natural Resources Defense Council (NRDC)

2. Incentives for Full-Size Pickup Trucks Should Require Wide Scale Technology Deployment and Phase Out during Model Years 2017-2025

NRDC agrees that the proposed truck incentives should be limited to just full-size pickups. While full size pickup trucks may often be used for the main purpose of transporting just passengers, these trucks are the most likely light-duty vehicles to have legitimate non-passenger applications such as handling large and heavy cargo payloads and/or towing. NRDC believes that known technologies can be applied to address the payload needs while also significantly improving fuel efficiency and reducing GHG emissions. However, these technologies only deserve special incentives if they can be scaled up for widespread application. [EPA-HQ-OAR-2010-0799-9472-A2, p. 12]

NRDC supports the proposed requirement that manufacturers reach minimum volume levels in order to be eligible for the full-size pick truck incentives. The minimum volumes require a commitment from manufacturers for wide scale production and deployment. [EPA-HQ-OAR-2010-0799-9472-A2, p. 12]

Among the truck incentives being proposed, NRDC appreciates the inclusion of a technology-neutral, performance-based credit structure. Performance-based targets allow for new innovation but can also bring uncertainty in the verification of real-world results. Due to the uncertainty, NRDC supports constraining the credit allowance to truck credit to no more than five consecutive model years or until emissions increase. [EPA-HQ-OAR-2010-0799-9472-A2, p. 13]

NRDC agrees that vehicles receiving the performance-based credit be prohibited from receiving hybrid truck credits. [EPA-HQ-OAR-2010-0799-9472-A2, p. 13]

NRDC also agrees that the mild hybrid truck incentive be no more than 10 g/mi. When analyzing the effectiveness of the mild hybrid technology—which EPA notes has not been done for the NPRM—EPA should consider reducing the maximum credit available to be consistent with the analysis. [EPA-HQ-OAR-2010-0799-9472-A2, p. 13]

Organization: NGV America

Advanced Pickup Truck Credits

For 2017–2025, EPA and NHTSA have proposed special credits for pickup trucks. There is a credit for mild- and also for strong-hybrid pickups, and a separate credit for pickups that are able to meet prescribed GHG reductions. The description in the proposed rule appears to indicate that hybrid pickups and pickups that satisfy the GHG performance criteria will earn GHG and FE credits. The descriptions of the incentives contained in the proposals are reprinted here:

As with the HEV-based credit, the performance-based credit/value requires that the technology be used on a minimum percentage of a manufacturer's full-size pickup trucks. That minimum percentage for the 10 g/mi GHG credit (equivalent to 0.001125 gal/mi fuel consumption improvement value) would be 15 percent of a company's full sized pickup production in MY 2017 with a ramp up to at least 40 percent of production in MY 2021.

The minimum percentage for the 20 g/mi credit (equivalent to 0.002250 gal/mi fuel consumption improvement value) would be 10 percent of a company's full sized pickup production in each year over the model years 2017–2025.

First, we recognize that pickup trucks are among the most challenging in terms of meeting aggressive future requirements. As a result, we recommend that the agencies provide the broadest array of credits for game changing technologies implemented on these vehicles. The agencies have proposed credits for either hybridizing these vehicles or providing superior emissions performance. We recommend that the agencies also consider and include additional credits for natural gas applications on pickup trucks. We would be happy to work with the agencies to develop credits that fully recognize the benefits that natural gas can provide on these trucks. We have outlined earlier the types of incentive we believe are necessary and appropriate to encourage the development and sale of light-duty NGVs.

Second, with respect to the performance-based credits provided for pickup trucks, we offer the following comments. We agree that all technologies should have the opportunity to earn credits under this provision, and we expect NGVs will qualify based on the performance levels proposed. Also, we believe that, if specific credits are provided elsewhere in the rules for NGVs, that such vehicles, like for gasoline-hybrids, should not earn double credits under those provisions and also under the pickup truck credit provision. If no additional credits are provided for NGVs, then they should have the potential to earn credits under this program. Regardless, we believe that the proposed targets -- 10% - 15% of production -- for introduction are simply too high with respect to NGVs, and that EPA and NHTSA should amend the proposal to provide a lower threshold. We propose that a more reasonable target for NGVs would be tied to penetration of the commercial and public fleet market as opposed to the overall market for trucks since NGVs and other alternative fuel vehicles likely will be targeted mostly to fleets during their initial introduction for a number of reasons. [EPA-HQ-OAR-2010-0799-9461-A1, pp. 13-14]

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

NESCAUM supports EPA's proposal to include flexibility mechanisms to provide manufacturers with the means to incorporate a range of technologies to meet the requirements of the proposed standards. [EPA-HQ-OAR-2010-0799-9476-A1, p. 2]

Organization: Toyota Motor North America

The agencies have proposed to provide 'credits' for deployment of hybrid electric technology on full-size pick-up trucks (FSPUs). Toyota appreciates and supports the agencies' objective to promote hybrid electric technology in vehicle segments that have proven difficult to penetrate, but numerous market segments currently have a lower penetration rate of hybrid electric technology than does the FSPU segment. Therefore, limiting the proposed credits to FSPUs appears arbitrary. [EPA-HQ-OAR-2010-0799-9586-A1, p.2]

Full Size Pick Up (FSPU) Credits [EPA-HQ-OAR-2010-0799-9586-A1, p.14]

The agencies have proposed incentives for the adoption of 'game changing' technologies that could provide significant environmental and energy benefits for full-size pick-up trucks (FSPUs) while preserving their utility characteristics. Two specific credit incentives are proposed; (1) for FSPUs that perform 15-20 percent better than the vehicle's CAFEI CO_2 attribute targets regardless of the technology used on the vehicle~ and (2) for FSPUs using hybrid technology once certain sales thresholds are met. As proposed, a given FSPU could not qualify for both of these credits. [EPA-HQ-OAR-2010-0799-9586-A1, pp.14-15]

Toyota appreciates the challenge of reducing emissions and improving the fuel economy of FSPUs. However, as explained in more detail below, Toyota has concerns about both of these provisions. [EPA-HQ-OAR-2010-0799-9586-A1, p.15]

Credit for FSPUs Achieving 15-20 Percent Better than Target [EPA-HQ-OAR-2010-0799-9586-A1, p.15]

The agencies have proposed a variety of reasonable and necessary flexibilities related to advanced technology vehicles that span all vehicle segments, including FSPUs (for example, sales multipliers for plug-in hybrids, electric vehicles and fuel cells). The agencies have also proposed credits for FSPU hybrids (discussed below). Therefore, it remains unclear to Toyota why the credit provision for 15-20 percent above target is needed for the FSPU segment. Toyota requests that, based on the myriad other proposed flexibilities available for this segment, and the generally less stringent target curves proposed for large trucks, the agencies drop this provision. [EPA-HQ-OAR-2010-0799-9586-A1, p.15]

Scope of the FSPU Hybrid Technology Provision [EPA-HQ-OAR-2010-0799-9586-A1, p.15]

The agencies appear to have arbitrarily limited which trucks are eligible for hybrid credits. While Toyota appreciates and supports the agencies' objective to promote hybrid technology in vehicle segments that have proven difficult to penetrate, numerous market segments currently have a lower penetration rate of hybrids than does the FSPU segment. According to EPA-published data for 2010 model year4 shown in Appendix 2, the FSPU segment is not unique in terms of low hybrid penetration. In fact, a number of car and truck segments have an even lower penetration than the 'large' pick-up truck segment. Among all truck segments, hybrid share for 2010 model year was only 1.6 percent industry-wide. Clearly, hybrid penetration is an issue for the entire car and truck fleet, and particularly so for the truck fleet. Toyota's own data supports this view as well. For the 2011 model year, hybrids comprise 1.5 percent of Toyota's entire light-duty truck product line, which is an order of magnitude less than the 15.6 percent penetration rate for Toyota passenger cars during the same model year. [EPA-HQ-OAR-2010-0799-9586-A1, p.15]

Toyota requests that the credit for hybrid FSPUs be extended to all truck segments. Notwithstanding this request, the comments below address specific details of the proposed FSPU hybrid credit. [EPA-HQ-OAR-2010-0799-9586-A1, p.15]

Minimum Sales Volume Threshold for FSPU Hybrid Credits [EPA-HQ-OAR-2010-0799-9586-A1, p.15]

The agencies are proposing minimum sales percentages of a manufacturer's full-size pick-ups be equipped with hybrid technology before credits can be generated. These minimum sales percentages vary by model year, and whether the hybrid system is 'strong' or 'mild'. As explained previously for off-cycle technology credits, arbitrary sales thresholds, absent market demand, will do nothing to speed deployment. The likelihood of falling short of the sales thresholds are far greater for hybrids compared to off-cycle technologies given the higher cost of hybrid technology and the higher minimum sales percentages required. We again refer the agencies to Appendix 1, which contains analysis of technology penetration rates. For additional reference, Toyota has only reached 1.5 percent hybrid penetration rate for trucks after nearly 8 years of marketing hybrid trucks in the U.S. [EPA-HQ-OAR-2010-0799-9586-A1, pp.15-16]

We understand the agencies' goal for the thresholds is to reward meaningful hybrid technology deployment. However, we are concerned that thresholds will be counterproductive to achieving this goal. In fact, a maximum threshold appears more appropriate than the proposed minimums because commercially viable technologies eventually attain a level of market acceptance where incentives are no longer necessary. The proposed minimum thresholds would guarantee credits for extremely high penetration rates that clearly no longer warrant incentives. [EPA-HQ-OAR-2010-0799-9586-A1, p.16]

Hybrid Credit Technical Issues [EPA-HQ-OAR-2010-0799-9586-A1, p.16]

To ensure that participating manufacturers employ hybrid technology that meets the intent behind the incentives, EPA is proposing definitions of 'mild' and 'strong' hybrid. Toyota supports EPA's intention to distinguish between strong and mild hybrids for the purpose of awarding FSPU credits. After careful analysis of EPA's metrics being proposed to define strong and mild hybrids, Toyota would like to offer the following comments based on our hybrid experience and expertise which would enhance the technical accuracy and robustness of this proposed FSPU provision. [EPA-HQ-OAR-2010-0799-9586-A1, p.16]

(i) Total Braking Energy (reference Chapter 5 of the TSD, section 5.3.3.2). The equation for determining Ebrake_max is incorrect. Specifically, EPA is proposing: [EPA-HQ-OAR-2010-0799-9586-A1, p.16] [There is an associated figure, please refer to EPA-HQ-OAR-2010-0799-9586-A1, p.16]

Toyota recommends the following revision: [EPA-HQ-OAR-2010-0799-9586-A1, p.17] [There is an associated figure, please refer to EPA-HQ-OAR-2010-0799-9586-A1, p.17]

(ii) Measurement of Recovered Braking Energy (reference TSD, section 5.3.3.1). EPA proposes to incorporate a metric - the total percentage of available vehicle braking energy recovered over the test cycle (T]recovery) - as a way to define levels of hybrid vehicles. Toyota agrees that this metric can be a way to simplify the characterization of a hybrid as a 'mild' or 'strong' hybrid because batteries and motors will increase in scale to recover the relative braking energy. EPA's metric involves calculating the available braking energy on the FTP city cycle and comparing the actual energy recovered by the vehicle during FTP city cycle testing. The measured energy into the battery is divided into the total calculated braking energy to determine if the vehicle is a mild or strong hybrid. For a mild hybrid, EPA is proposing that the recovered energy must be greater than 15 percent and less than 75 percent of the calculated available braking energy. For a strong hybrid, EPA is proposing that the recovered braking energy must be greater than 75 percent of the calculated available braking energy. Toyota is providing specific comments on three particular aspects of the metric being proposed by EPA: [EPA-HQ-OAR-2010-0799-9586-A1, p.17] [There is an associated figure, please refer to EPA-HQ-OAR-2010-0799-9586-A1, p.17]

(A) EPA's definition of the Erecovered term does not match the equation. Toyota believes that Erecovered should be calculated based on charging energy recovered only when the vehicle is in deceleration mode. As is currently proposed, EPA's method incorrectly includes battery charge energy supplied by the engine. Toyota recommends that EPA revise the methodology to include the condition of 'onlv during deceleration' for the Erecovered calculation. [EPA-HQ-OAR-2010-0799-9586-A1, pp.17-18]

(B) EPA's equation for Ebrake_max is calculated by integrating required braking power at each point in the FTP test cycle, over the entire test. For technical accuracy, Toyota recommends that Ebrake_max be calculated from the measured vehicle speed trace instead. [EPA-HQ-OAR-2010-0799-9586-A1, p.18]

(C) In concert with adoption of the technical change recommended in paragraph (A), EPA's strong hybrid threshold of 75 percent would need to be revised because this threshold would be too high to be met only by battery charging during regenerative braking. Toyota's assessment of future concept hybrid systems shows an energy recovery efficiency threshold (T'\recovery) to be within the range of 35- 48 percent. Toyota's analysis shows that 11recovery becomes less as the vehicle weight increases. This reduction in recovery efficiency is because the traction motor cannot absorb all of the braking energy and the wheel-to-motor losses will increase for heavier vehicles. As a result, Toyota recommends that an appropriate threshold for 11recovery >40 percent. [EPA-HQ-OAR-2010-0799-9586-A1, p.18] [There is an associated figure, please refer to EPA-HQ-OAR-2010-0799-9586-A1, p.18]

(iii) Additional Metric Needed. Toyota remains concerned that the proposed llrecovery metric and associated thresholds would not be sufficiently robust in distinguishing between strong and mild hybrids. To clearly identify a strong hybrid system, Toyota supports inclusion of an additional metric, fedrive, to clearly distinguish between strong and mild hybrids. The fe_{drive} metric would represent the amount of tractive effort a vehicle can achieve with electric drive only. A description of this metric and appropriate threshold value is provided below. [EPA-HQ-OAR-2010-0799-9586-A1, pp.18-19] [There is an associated figure, please refer to EPA-HQ-OAR-2010-0799-9586-A1, p.19]

Organization: U.S. Coalition for Advanced Diesel Cars

The Coalition embraces the Obama Administration's support for investments in technologies that, in the future, will lead to the wide-spread adoption of new "Game-Changing" technologies. Still, these technologies, will not significantly penetrate the marketplace until well beyond 2025 - the timeline for this rulemaking. This is why the Coalition strongly urges EPA and NHTSA to focus more on incentivizing "Game-Changing" fuel savings based on the ability of automakers to incorporate as many existing and developing technologies that can have the broadest impact for fuel economy for model years 2017 and 2025. [NHTSA-2010-0131-0246-A1, p.2]

Only a performance-based system for awarding credits to manufacturers – specifically with regard to full-sized pickup trucks – that is consistent across all technologies; [NHTSA-2010-0131-0246-A1, p.2]

The Coalition opposes EPA and NHTSA's intention to offer manufacturers incentives for hybrid technology utilized in the full-sized pickup truck market. The Coalition supports a single performance-based credit and argues that a separate hybrid credit is unnecessary and poorly conceived. [NHTSA-2010-0131-0246-A1, p.3]

Specifically, incentives, in the form of credits, will be offered in one of two ways - to manufacturers that produce hybrid electric vehicle (HEV) pickup trucks and to those that produce pickup trucks that meet a performance based standard. As stated earlier, the Coalition opposes any credit that is used to incentivize a particular technology in a specific vehicle class as opposed to incentives based solely on fuel economy increases and GHG emission reductions. [NHTSA-2010-0131-0246-A1, p.3]

In its current form, the hybrid full-sized pickup truck credit should be revised or eliminated from the Final Rule for the following reasons. [NHTSA-2010-0131-0246-A1, p.3]

GHG Reduction Target for Full-Sized Pickup Trucks' HEV Credit: The NPRM's description of the HEV pickup truck credit does not carry any CO_2 reduction requirements whatsoever. Although the agency outlines the dimensions of a pickup truck that can qualify for the credit, to the NPRM does not mention the volume of CO_2 or gallons of fuel these HEV trucks are supposed to save for the consumer and for the nation. Furthermore, at no point in the NPRM or the Draft Joint Technical Standards Document do the agencies support the need for a separate HEV incentive from the Performance Based Incentive. [NHTSA-2010-0131-0246-A1, p.3]

The Credit Does Not Include a Minimum Fuel Economy Threshold Provisions: While EPA specifies the amount of recovered break-energy these HEV trucks must achieve, EPA does not specify how that recovered energy should be used to benefit the environment or reduce national petroleum consumption. The proposed rule is void of any language that communicates anti-backsliding provisions that were once at the core of EPA's mobile source rulemaking. Under the language of this proposal, a "horsepower war" in the full size pickup truck market could emerge as long as these trucks carry a battery pack. EPA's authority should be used to ensure reduced emissions and fuel consumption without ambiguity. [NHTSA-2010-0131-0246-A1, pp.3-4]

Larger GHG Footprint and Decreased Fuel Economy: EPA is proposing a 20 g/mile credit for hybrid pickup trucks without requiring any GHG reduction or fuel economy improvement over the baseline foot print target. Without prescribing technology performance benefits, EPA's proposal could incentivize vehicles that undermine, rather than advance, the nation's policy objectives. As such, the Coalition requests that EPA and NHTSA require qualifying vehicles to actually reduce CO_2 and petroleum use in the real-world by 20 percent below the footprint target. [NHTSA-2010-0131-0246-A1, p.4]

Furthermore, the EPA and NHTSA identify the need that these vehicles have for more power based on traditional towing and hauling needs yet fail to clarify how the traditional drive cycle of the full-sized pickup truck driver would benefit from the hybridization of these vehicles. Assuming the need for more towing power and use at highway speeds, these owners will not enjoy any improved fuel economy or GHG reduction as a result of the hybridization. While other technologies added to the truck may improve fuel economy at highway speeds, there is no indication that GHG reductions from the hybrid credit will be "Game-Changing." [NHTSA-2010-0131-0246-A1, p.4]

As such, the Coalition requests that EPA or NHTSA publish any real-world data that indicates drivers of full-sized pickup trucks predominately are used in a stop and go driving pattern or that the credit as offered will be designed to significantly improve fuel economy and GHG emission reductions at highway speeds. [NHTSA-2010-0131-0246-A1, p.4]

Erasing Market Challenges: EPA states that it intends to utilize "game changing credits" to overcome market challenges faced by hybrid pickup trucks. The agencies have cited the expense to bring this technology to the light truck segment. These credits, however, cannot guarantee demand. Hybrid powertrains have been available on pickup trucks in the U.S. market since MY 2005. Since that time, some hybrid variants have been dropped by manufacturers due to the lack of customer demand. By 2011, in fact, less than one-quarter of a percent (0.23%) of customers selected the hybrid pickup truck option where it was available as an option. In contrast, depending on the model, 15% to 50% of customers selected a diesel powertrain when such an option was offered. [NHTSA-2010-0131-0246-A1, p.4]

The Coalition does not believe that offering the full-sized pickup hybrid trucks a credit will overcome the enormous market challenges that these vehicles have faced for the last 7 Model Years. We see as evidence that even offering a $7,500 credit has not helped the electric vehicle market hit predicted sales targets. The Coalition urges EPA and NHTSA to focus solely on a performance based standard aimed at encouraging manufacturers to add all advanced technologies to this segment. A technology neutral credit will lead to faster adoption and greater fuel economy gains. [NHTSA-2010-0131-0246-A1, p.4]

Small Pickup Truck Market: The agencies have requested comments on expanding the scope of its performance credits to include somewhat smaller pickup trucks. The Coalition strongly supports expansion of this definition to encourage the broadest possible adoption rates for advanced, fuel saving technologies in the fleet, but ONLY under the performance-based rules where the vehicles that the EPA is incentivizing actually reduce emissions and fuel consumption. [NHTSA-2010-0131-0246-A1, p.5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 243-246.]

In the NPRM, EPA and NHTSA outline proposals that offer manufacturers incentives to incorporate game-changing technologies into the full-sized pickup truck market. These incentives in the form of credits come in two forms. One will provide credits to manufacturers to produce hybrid electric pickup trucks, another will award credits to manufacturers that produce pickup trucks that meet a similar performance-based standard.

EPA and NHTSA argue the HEV technology in pickup trucks is an emerging technology that faces substantial challenges in gaining initial market penetration. The Coalition finds this argument tenuous on a number of levels. First, the Coalition believes the HEV technology, which has been on the market for over a decade, is not an emerging technology today, and certainly will not be an emerging technology in 2017 when these credits are set to go into effect. To the contrary, light-duty HEV's have been a viable option for a number of consumers, particularly those who drive in urban conditions. It might be considered an emerging application of an existing technology, but it certainly cannot be described as an emerging technology almost 20 years of being on the market, which will be the case when this rule goes into effect. In fact, the GMC Sierra and Chevy Silverado hybrid applications in the truck segment have been on the market for nearly a decade.

Second, EPA and NHTSA state that because of the substantial cost required to produce full-sized HEV pickup trucks, automakers have difficulty justifying the investments necessary to produce these vehicles without a government incentive. The Coalition believes that government incentives to create a market for specific technologies are the wrong path to achieve fuel efficiency gains and emissions reductions. Examining consumer acceptance of alternative vehicle technologies in light-duty vehicles where hybrid technology is already well established foreshadows the pratfalls of choosing a single technology winner for the full-sized pickup truck segment on a technology neutral approach that promotes all advanced technologies will achieve real results.

Despite inquiries to the agencies and with suppliers, we are unaware of any data that demonstrates that most full-sized pickup truck owners accumulate the majority of miles under urban conditions and duty cycles. Conversely, these light trucks will be burdened with carrying the significant weight of the battery technology at highway speeds while using a gasoline or a diesel-powered engine.

By driving conditions that do not utilize the benefits of hybridization, it is unclear that the fuel economy gains and emissions reductions have predicted to result from this game-changing technology are actually attainable.

The Coalition sees no benefit in maintaining a performance-based credit and a separate credit for full-sized HEV pickup trucks when the latter can, and should, qualify under a strictly performance-based structure. Instead of sending a strong signal to both manufacturers and consumers that hybrid trucks represent the best technology option, EPA and NHTSA should make the case for any technology that meets the aggressive guidelines set forth by the NPRM.

Organization: United Automobile Workers (UAW)

The UAW also believes that the agencies are wise to offer an incentivized path for the application of technologies other than hybridization for large pick-up trucks. This technology-neutral option offers CO_2 credits and fuel-economy calculation adjustments for vehicles that substantially over-comply with the applicable footprint-based target. The proposals take appropriate measures to prohibit double counting the available incentives for large pick-up trucks. [EPA-HQ-OAR-2010-0799-9563-A2, p.3]

The UAW is especially supportive of EPA and NHTSA's proposed incentives for the addition of advanced technologies to large pick-up trucks and the proposed performance-based credits for large pick-ups that significantly exceed the applicable footprint-based target. [EPA-HQ-OAR-2010-0799-9563-A2, p.3]

We believe the credits proposed by EPA and the fuel-economy calculation adjustments proposed by NHTSA for significant hybridization of a manufacturer's full-size pick-up fleet are worthwhile incentives that will quicken the pace of introduction of these advanced technologies in a market segment that faces unique challenges in improving efficiency while maintaining full functionality. The proposed incentives are sensible because these technologies can improve efficiency without compromising functionality, even though they will certainly be expensive in the early years of the proposed rule. The UAW believes that these incentives will hasten the transformation of the large pick-up segment, and will ultimately result in a full-size pick-up fleet that is significantly more efficient much sooner than would be the case without the additional incentive. [EPA-HQ-OAR-2010-0799-9563-A2, p.3]

Organization: VNG Co. (VNG)

Unlike electricity, natural gas is a viable option for the full range of vehicle c1asses including larger vehicles like pickups and other light trucks, which have vehicle envelopes that can easily accommodate CNG tanks. Given that light trucks account for slightly more than half of all US vehicle sales today (and 60 percent or more of Big Three sales),11 light-truck friendly NGV technology can play a major role in ensuring the 'economic practicability' of these rules. As defined in the NPRM:

'Economic practicality refers to whether a standard is one 'within the financial capability of the industry, but not so stringent as to lead to adverse economic consequences, such as a significant loss of jobs or the unreasonable elimination of consumer choice.'" [EPA-HQ-OAR-2010-0799-7941-A2, p. 4]

As discussed below, the Agencies have already acknowledged the importance of the pickup truck segment for meeting this economic practicality criterion with their proposal for special credits to encourage deployment of 'game-changing' technologies in these vehicles. By extension, the economic practicability of these and future regulations will be greatly enhanced if they provide appropriate, fair and consistent support for the production of NGVs, which will provide a much-needed long-term platform for reducing emissions and petroleum consumption for the entire light truck segment of the market. [EPA-HQ-OAR-2010-0799-7941-A2, p. 4]

• Incentives for 'game-changing' GHG-reducing technologies deployed in fullsized pickups could be a significant benefit to natural gas, which is the most viable alternative fuel for this critical vehicle segment; [EPA-HQ-OAR-2010-0799-7941-A2, p. 5]

Game-Changing Pickup Truck Credits

VNG understands the challenges that automakers face in terms of achieving the 2025 standards for full-size pickup trucks and we strongly support the Agencies' decision to provide special incentives to facilitate the adoption of advanced technologies in this segment. Moreover, we believe that the technology-neutral 'performance-based' credit, based on GHG emission reductions, is an important option for automakers that could help facilitate the production of significant numbers of natural gas-fueled pickups. [EPA-HQ-OAR-2010-0799-7941-A2, p. 7]

With tailpipe GHG emission reductions from CNG of 24 percent compared to gasoline,23 both dedicated and dual-fuel NGV pickups with significant range (assuming use of utility factor methodology) are likely to qualify for the 20 percent GHG reduction threshold. Moreover, unlike plug-in electric capability, which is not expected to be achievable for this segment due to 'tradeoffs in terms of cost, electric range, and utility,” dual-fuel natural gas capability is particularly well suited to pickups due to the relative ease of incorporating CNG tanks in large vehicle envelopes. Indeed, both GM and Chrysler have already announced plans to produce NGV pickup trucks this year.25, 26 Due to their significant fuel use and popularity as fleet vehicles, the pickup segment can be the base market for the broader development of NGVs. [EPA-HQ-OAR-2010-0799-7941-A2, p. 7]

Given the importance of the pickup truck segment to maintaining a full range of consumer choice, as well as the desirability of moving as many vehicles as possible towards the use of low-emission, alternative fuels, VNG supports the Agencies' consideration of expanding eligibility for these credits to include smaller pickup trucks with similar towing capacity. [EPA-HQ-OAR-2010-0799-7941-A2, p. 8]

We also believe that the minimum penetration thresholds (of 10 percent for the 20 g/mi credit and 15-40 percent for the 10 g/mi credit) for all of the game-changing pickup credits should be eliminated. Automakers should be encouraged to produce even limited quantities of these vehicles, which may be a necessary first step to test consumer acceptance in early years. [EPA-HQ-OAR-2010-0799-7941-A2, p. 8]

Finally, the Agencies offer no rationale for imposing a five-year limit on the performance-based 20 g/mi credit for a specific pickup model, where no such limit exists for equivalent hybrid-electrics. Given the similar impacts of both hybrids and performance-based credit pickups on emissions, as well as the broader importance of facilitating technological evolution in this segment, there is no justification for placing special limits on performance-based credits. Thus, the 5-year cap should be eliminated. [EPA-HQ-OAR-2010-0799-7941-A2, p. 8]

---

11 http://online.wsLcom/mdc/public/page/2_3022-autosales.html

23 http://greet.es.anl.gov/results

25 http://www.csnews.com/top-story-cng_the_fuel_alternative_of_the_future-60215.html

26 http://www.businessweek.com/news/2012-0 1-13/chrysler-to-begin-natural-gas-truck-sales-to-fleets-in-2012.html

Organization: Volkswagen Group of America

Prescribe restrictions on the use of targeted, segment exclusive credits which we predict will provide a windfall for competitors marketing high-emitting large trucks and pick-ups. [EPA-HQ-OAR-2010-0799-9569-A1, letter p. 2]

Expand the range of technologies included within several flexibilities and incentives in order to promote the introduction of a broader set of fuel saving, low-emission options. [EPA-HQ-OAR-2010-0799-9569-A1, letter p. 2]

- Prescribe restrictions on the use of targeted, segment exclusive credits to avoid a windfall for competitors marketing high-emitting large trucks and pick-ups; and [EPA-HQ-OAR-2010-0799-9569-A1, p. 4]

c. Broad flexibilities and program credits available to all fleet segments

Continue to build upon the credits and flexibilities provided in the 2012-2016 regulatory program. Credits and flexibilities should be equal for passenger cars and light trucks due to similar requirements for investment and overall impact on CO_2 reduction. [EPA-HQ-OAR-2010-0799-9569-A1, p. 5]

Further the trading flexibility within and across compliance fleets should be sufficient to cover any vehicles with additional challenges in complying with 4%. [EPA-HQ-OAR-2010-0799-9569-A1, p. 5]

e. includes substantial compliance credits that are available for only a limited range of technologies, or are available only for specific segments (Full-Size Pick-Up Trucks); and

f. Fails to provide credit mechanisms that would have encouraged greater use of biofuels. [EPA-HQ-OAR-2010-0799-9569-A1, p. 6]

In addition, in contrast to Volkswagen's principle of equal credit opportunities across all segments, the proposal once again targeted benefits towards larger trucks by providing a significant credit opportunity only available to full-size pick-up trucks. Volkswagen contends and will describe below how this segment exclusive credit has the potential to create a windfall of excess truck credits that can then be transferred to the passenger car segment. [EPA-HQ-OAR-2010-0799-9569-A1, p. 6]

EPA is proposing a suite of CO_2 incentives exclusive to full-size pick-up trucks for 2017-2025. This flexibility provides 10 or 20 g/mi for hybridization and a separate 10 or 20 g/mi incentive for non-hybrid low emitting vehicles. Volkswagen opposes this provision within the NPRM. [EPA-HQ-OAR-2010-0799-9569-A1, p. 22]

First, as illustrated above in Section 2.6, it is Volkswagen's position that the full-size truck segment is not uniquely challenged by this proposal and that these vehicles do not face a disproportionately more stringent requirement than other segments. Again we refer to Table 2-7 above which summarizes the continuing minimal reduction requirements for large trucks. [See Table 2-7 on p. 19 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 22]

The Joint TSD indicates an approximate effectiveness for mild and P2 hybridization for large trucks on the order of 8-15%. Section 2.6 described an example full-size pick-up truck from the RIA (Chapter 3) which was 4% above its MY2017 target of 347 g/mi (72ft2 footprint target). This includes estimated A/C credits which according to Table III-2 in the NPRM amount to 12 g/mi. Strong hybridization would provide 56 g/mi (estimated TSD effectives of 15%) reduction captured in the two-cycle city/highway test used for compliance. According to the definition for Mild and Strong hybrid within the full-size truck credit section, these vehicles must be equipped with stop/start technology. Stop/Start technology is also being rewarded an additional 4.5 g/mi under the off-cycle technology 'list'. There is no stipulation in the rule that vehicles claiming the Full-size Truck hybrid credit cannot also claim the start/stop off-cycle credits even though one is required for the other. Therefore we must assume that the credit available is actually 14.5 or 24.5 g/mi. [EPA-HQ-OAR-2010-0799-9569-A1, p. 22]

As summarized in Table 2-8 this hybridized pick-up would earn upwards of 67.5 g/mi credits beyond its footprint target (0.3% stringency from 2016) which if transferred to the passenger car fleet would be inflated through VMT to upwards of 77 g/mi. [See Table 2-8 on p. 23 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 22]

This calculation does not include further conventional technology improvements which in Section 2.6 illustrated that hybridization would not even be necessary for this vehicle to comply. Hybridization of the truck would require a significant investment by the manufacturer and the reward in credits is warranted, however in this case the full-size truck credit (in addition to the accompanying stop/start credit) amounts to an excessive pool of credits that can be transferred to other market segments, including smaller trucks and/or passenger cars. This transfer of excess credits may result in a CO_2 disbenefit to the extent that the credit transfer reduces the need for other segments, many of which face more stringent reductions with fewer qualifying credits 6, to make improvements. [EPA-HQ-OAR-2010-0799-9569-A1, p. 23]

Figure 2-10 illustrates the transfer and maximum potential tailpipe emissions that a 45ft2 footprint passenger car could have and still remain compliant. Credit transfers will extend the reach of the large truck reduced stringency and full-size truck incentives to smaller trucks, or passenger cars. Manufacturers with significant quantities of large trucks may accumulate a windfall of credits which can then offset the CO_2 reduction obligations for their remaining smaller truck and car fleet. Companies that do not manufacture large pick-ups will be obligated to meet the passenger car targets without the benefit of these offsetting credits. [See Figure 2-10 on p. 24 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 23]

A car receiving the full transfer of credits from the full-size truck could theoretically retain tailpipe emission levels in excess of 300 g/mi. This is higher than 2012 MY standards by a significant margin. Even in a case where only the full-size truck credit and stop/start credit were transferred to the car fleet (28 g/mi VMT adjusted), the car's tailpipe level could reach 252 g/mi and remain compliant. This is less than the 2013 target. In this scenario the passenger car would be able to compete in the marketplace against other vehicles with a 40 g/mi investment advantage. This could result in that vehicle having a significant sales price advantage relative to other segment competitors. [EPA-HQ-OAR-2010-0799-9569-A1, p. 24]

This not only detracts from program CO_2 goals, but also amounts to an economic advantage for manufacturers of large trucks. The full-size truck credit does not represent real-world CO_2 reductions and in fact may offset real world CO_2 savings in other segments. [EPA-HQ-OAR-2010-0799-9569-A1, p. 24]

This means that the flexibility must be judged in light of the economics instead of environmental benefits. This is contrary to some of the other credits being offered within the program. Volkswagen does recognize that the same argument can be made with respect to credits being provided for electrified vehicles through the EV multiplier. However, in light of the economics context, we do note that EPA's cost estimates for plug-in electrification (either full EV or PHEV) far exceeds EPA's cost estimates for mild or even strong (P2) hybridization. The extent of investment needed to take advantage of the EV multiplier far outweighs the investment that would be required for a manufacturer to equip a vehicle with an open bed and regenerative braking. [EPA-HQ-OAR-2010-0799-9569-A1, p. 24]

In addition, EPA has cast the credit flexibility as incentivizing 'game-changing' technologies. Volkswagen disagrees with this notion and believes that this terminology is misleading. Hybridization of any vehicle remains an expensive and challenging technical endeavor, but we feel that this is equally true amongst all vehicle classes. Employing the term, 'game changing', leads one to believe that the technology has never before been attempted or that there has been a leap forward in capability to somehow make the technology significantly more effective in its application 7. We fail to see how regenerative braking on a vehicle with an open bed represents a "leap forward" in automotive technology, at least to the extent that it is awarded such a generous credit. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 24-25]

As previously discussed in Section 2.6, Volkswagen's analysis of a market leading full-size truck indicated that the need to award additional, segment exclusive credits is unwarranted. Even without the available HEV incentive, a modest application of low-cost conventional technologies to this sample vehicle resulted in a significant pool of credits being generated. This is the simply the result of large trucks being provided with a low stringency. [EPA-HQ-OAR-2010-0799-9569-A1, p. 25]

EPA has stated that in the aggregate they predict the full-size truck credits will have around 1 g/mi impact on the overall industry truck compliance. However, Volkswagen is concerned with the effect that large truck credit windfalls may have when examining the implications at the manufacturer level. Although EPA's assessment at the industry level may seem insignificant, at the manufacturer level, the level at which we compete, the truck credits may provide significant company level advantages. Figure 2-11 shows the disparity in vehicle composition between competitors in the marketplace. The manufacturer on the left has a truck heavy fleet composed of upwards of 25-30% of a single full-size pick-up model. Clearly the full-size truck benefits would provide an economic and competitive benefit for this manufacturer. Volkswagen's fleet illustrated on the right side of Figure 2-11 is dominated by low-emitting small and medium sized passenger cars, both of which are subjected to the more stringent standard without the benefit of truck credits. [Figure 2-11 can be found on p. 25 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 25]

In some cases, there are some manufacturers who sell more full-size pick-up trucks than passenger cars combined. In comparison, the majority of Volkswagen's sales are passenger cars. This segment faces the higher 5% stringency without the benefit of segment specific credits. In addition, the car segment is awarded fewer credits than trucks in A/C and off-cycle technologies. [EPA-HQ-OAR-2010-0799-9569-A1, p. 26]

It is not a stretch to imagine that manufacturers with pick-up focused fleets will easily be able to accumulate credits from both the lower stringency and available additional flexibilities. These credits can be transferred to offset investment in CO_2 reducing technologies for other segments, in turn reducing the price for consumers. This is not a transfer of real CO_2 from an over-compliant vehicle to under-compliant vehicle, but rather an economic transfer. Manufacturers who are not marketing full-size trucks will be offered no such economic benefit. Although Volkswagen understands that it is EPA's intention through this credit to help full-size trucks comply, we certainly do not believe it is EPA's intention to expand the number of OEMs marketing full-size pick-up trucks. Regardless that may very well be the result. [EPA-HQ-OAR-2010-0799-9569-A1, p. 26]

---

5 S/S is Off-cycle credit for stop/start technology. S/S is a necessary technology for qualification for Mild and Strong HEV under the full-size pick-up credits. Valued at 4.5 g/mi for trucks.

6 VW notes that not only are full-size trucks qualified for the 'game-changing' credits, but also qualify for higher credits under the A/C and off-cycle programs. This further compounds the inequity.

7 An immediate example of 'game changing' technology may be the introduction by Cadillac of the electric starter which opened up vehicle operation and ownership to people regardless of physical strength and free from the fear of injury.

Response:

Comments For and Against the Credit Program

Most of the commenters supported the large truck credit concept. ICCT, Volkswagen, and CBD opposed adopting the proposed incentive, arguing that this vehicle segment is not especially challenged by the proposed standards, that hybrid systems would readily transfer to it from other vehicle classes, and that the credit essentially amounts to an economic advantage for manufacturers of large trucks. CBD also commented that this credit should not be adopted, since they believe hybrid technology should be forced by aggressive standards rather than encouraged through regulatory incentives. Some environmental organizations also expressed concern about the real-world impacts of offering this credit, and suggested various ways to tailor it to ensure that fuel savings and emissions reductions associated with it are genuine.

Arguments made by commenters for not adopting the large truck technology credit are not convincing. Although there may not be inherent reasons for a lack of hybrid technology migration to large trucks, it is clear that this migration has nevertheless been slow to materialize for practical/economic reasons, including in-use duty demands and customer expectations. These issues still need to be addressed by the designers of large pickups to successfully introduce these technologies in these trucks, and we believe that assistance in the form of a focused, well-defined incentive program is warranted.

CBD expressed concern about how well the credits correspond to the actual improvements obtained. As in past EPA incentive programs aimed at encouraging advanced technology several years into the future, this is very difficult to assess quantitatively ahead of time. We discuss the value of incentive programs such as this one in response to comments regarding “level playing field” and short-term vs. long-term benefits of incentives in section 2 of this document, and in response to comments regarding the value of temporary regulatory incentives in section 4 of this document. We note too that, beyond its value in encouraging advanced technology in the full-size pickup truck sector, this credit program has added potential benefits because of the possibility of migrating the technology to even larger trucks. (See the heavy-duty vehicle GHG final rule for discussion of incentives to encourage the introduction of hybrid heavy-duty trucks—76 FR 57106, September 15, 2011.) The concerns expressed by Volkswagen and ICCT that the pool of credits generated by hybrid trucks will be excessive, and may result in an overall CO2 disbenefit and significant delay in technology introduction to other sectors, also seem unwarranted. The relatively small size of the full-size truck fleet compared to the rest of the light-duty sector, combined with our criteria for qualifying for the credits, limits the likelihood of a flood of market-shifting credits into the lighter vehicle sectors. Obviously, manufacturers who do not make full-size trucks will not be able to earn credits, but we believe the controls we are exercising in implementing the program (minimum production thresholds, truck definitions, limited model years, and performance criteria, etc.) serve to carefully target the incentives without creating undue advantages.

Our targeting this incentive program to full-size trucks is based on the challenge of applying the advanced technologies to them. As evidence that this challenge is substantial, we point to the fact that two companies ranking among the leaders in automotive hybrid technology, Ford and Toyota, have found it helpful to team up and work jointly on developing truck and

SUV hybrid technology over a multi-year span.[13] We also highlight Chrysler's comments that a major part of the challenge is applying advanced technologies in a way that preserves a truck's utility and accounts for added costs (as considered in the feasibility analysis for this rulemaking), both of which are critical for purchaser acceptance. The acceptance issues are especially important for large truck hybrids because the smaller engines that facilitate much of a hybrid's benefit are typically at odds with the importance some pickup truck buyers place on engine horsepower and torque, whatever the vehicle's real performance.

The U.S. Coalition for Advanced Diesel Cars questioned the granting of credits for hybrid technology, relying as it does on stop-start and regenerative braking technologies, in light of the lack of data on full-size pickup truck driving patterns. We agree that driving pattern data specifically for these large trucks are not plentiful, but do not agree with the implication that the trucks are driven extensively without sufficient braking and stopping activity so as not to warrant application of hybrid technology (and by extension that the credit would not reflect real-world environmental benefit). For example, many of these trucks are owned by urban and suburban small businesses engaged in construction, home maintenance, lawncare and the like, with daily travel activities involving frequent slowing and stopping. Full-size truck use on farms would also involve non-highway patterns requiring substantial braking. Furthermore, should hybrid technology, added at considerable cost, not yield real-world fuel consumption benefits for purchasers, it is doubtful that manufacturers would pursue it simply to gain credits.

By way of clarification prompted by the Coalition's comments, both the hybrid and performance-based credits are equally available for vehicles of all fuel types, including diesel. The Coalition also expressed concern that the program does nothing to discourage a "horsepower war" among the full-size truck manufacturers, exacerbated by the need for the trucks to carry the added weight of battery packs. In response we note that the standards remain on a gram per mile basis, so any future increases in horsepower for reasons related to curb weight or marketing will not make it easier to comply under our program— the footprint-based standard applies without regard to horsepower, and likewise the credit amount does not depend on horsepower.

Definition for Large Pickup Trucks and Extension of Credits to Smaller Vehicles

Some OEM commenters argued that these credits should be extended to other vehicles such as SUVs and minivans. We believe that doing so would greatly expand, and therefore dilute, the intended credit focus. The agencies do not believe it is necessary to provide such incentives for application of hybrid technology in these additional categories, beyond what is appropriate to account for off-cycle performance, or that the performance levels required of non-hybrid technologies eligible for credits are of such stringency that extending credits to all or most light-duty trucks would amount to anything more than a de facto lowering of overall program stringency. Although commenters rightly pointed out that some of these non-truck vehicles do have substantial towing capacity, most of them are not much used as towing vehicles, in contrast

[13] "Ford, Toyota to Collaborate on Developing New Hybrid System for Light Trucks, SUVs; Future Telematics Standards", http://toyotanewsroom.com/releases/ford+toyota+hybrid+trucks+suvs+telematics.htm, August 22, 2011.

to full-size pickup trucks that often serve as work vehicles.[14] Moreover, the smaller footprint vehicles fall on the lower part of the light-duty truck curve, and so have a higher rate of improvement (in stringency) than the larger trucks, thus making them more comparable to cars in terms of technology access and effectiveness. See preamble section III.D.7.

Mercedes-Benz suggested that the small car market (vehicles with footprints of 40 square feet or less) is also challenging for hybrid technology, for reasons of cost and architecture, and deserving of similar credit opportunities. Our expectation is that the primary barrier to hybrids in this market, the cost of hybrid technology compared to typical vehicle prices, is likely to diminish as battery costs decline over time. We do not believe that extension of the full-size truck credit program into this small car sector would be especially helpful in this regard. This differs from the large truck challenge where others factors such as preserving utility for work applications and purchaser acceptance are also key.

EPA sought comment on extending the pickup truck credits to smaller pickup trucks, specifically to those with narrower beds, down to 42 inches, but still with towing capability comparable to large trucks. This request for comment produced mixed reactions among truck manufacturers, and some argued that EPA should go further and drop the bed size limit entirely. ICCT and CBD strongly opposed any extension of the provision's scope to smaller bed trucks, arguing that adopting the 42" bed width criterion would allow virtually all pickup trucks to qualify, thereby distorting technology requirements and reducing the benefits of the rule. Beyond a general expression of support, there were no detailed comments backing the narrower bed width limit.

Chrysler commented that the proposed payload and towing capability minimums are too restrictive, making a sizeable number of Ram 1500 configurations ineligible to earn credits. However, the company provided no sales information to enable the agencies to reassess this issue. Moreover, the agencies did not premise the proposed incentive on every full-size truck configuration being eligible. Manufacturers typically offer a variety of truck options to suit varied customer needs in the work and recreational truck markets, and the fact that one manufacturer (or more) markets to applications lacking the towing and payload demands of the core group of vehicles in this segment does not, in the agencies' view, justify a revision of the hauling requirements that were a fundamental consideration in establishing the credit.

Definitions for Strong and Mild Hybrids

EPA received a number of manufacturer comments on these proposed definitions. Some industry commenters objected to EPA's characterization of the credit provisions as applying to hybrid "gasoline-electric" vehicles. We agree that this would be an overly narrow characterization, and are clarifying that the provisions also apply to non-gasoline (including diesel-, ethanol-, and CNG-fueled) hybrids. However, further extension to hybrids employing non-electric battery storage (including hydraulic-, capacitive-, and mechanical-energy storage), as urged by commenters such as EcoMotors, is complicated by the difficulty in developing regulatory procedures for all conceivable energy-storage media. We believe that these

[14] The 2011 segmentation and trend information provided in Ford's written comments demonstrates the ongoing trend toward greater use of full-size trucks for work purposes.

technologies are not hampered in participating in the large truck credit program because manufacturers using these technologies can utilize the alternative, performance-based pathway to gain the credits (assuming significant emissions reductions).

Ford, Toyota, and the Alliance of Automobile Manufacturers suggested improvements to the proposed procedure for determining whether hybrid technology is categorized as strong, mild, or having energy recovery too minimal to warrant credits. Most importantly, they argued that the proposed approach improperly integrated energy contributions over the entire city cycle FTP, thereby capturing more than just the intended recovered braking energy and creating an opportunity for gaming through tailoring of the direct addition of energy from the engine. They offered alternative procedures and corresponding recovered energy threshold levels based on energy input only during decelerations, with the recovery efficiency cutpoint between strong and mild hybrids correspondingly reduced from 75% to 40%. Chrysler maintained that a 75% energy recovery rate would be challenging for large pickups, even using the proposed procedure, because of the need to design the braking system for maximum payload and trailer capability while maintaining drivability in the absence of loads. Chrysler's specific recommendation was for a cutpoint of 50% energy recovery rate. Ford and Toyota also suggested an additional metric for qualifying strong HEVs – that at least 10% of the total tractive energy during positive accelerations on the FTP must be from the electric drive with the engine off.

As discussed in detail in section 5.3.3 of the TSD, we have evaluated these concerns and the suggested changes and have concluded that the proposed metric remains adequate for our purposes, and furthermore has the advantage of being simpler and easier to measure than other metrics. However, based on the comments received from Chrysler and follow-up testing described in section 5.3.3 of the TSD, showing that the only large hybrid truck currently marketed would not satisfy the proposed 75% metric, we believe that 65% is a more appropriate threshold for defining strong hybrid energy recovery, and so are adopting this threshold in the final regulations. We are retaining the proposed 15% threshold for mild hybrid energy recovery; we received no comments opposing this threshold.

Other commenters suggested dropping the hybrid-specific metric altogether, in favor of a CO2 performance-based metric instead, effectively removing the hybrid-specific credit. We favor retaining the hybrid-specific metric in addition to the more general performance-based credit option, because it more directly focuses the performance demonstration on the degree of hybrid technology utilization (a known technology with clear promise), while still making room for other technologies, including any innovations still beyond the horizon, through the performance-based credit option. In response to the Diesel Coalition's comments, the efficiency gains (which correspond to reductions in CO2 and fuel consumption) from hybrid vehicles are discussed in section 3.3.3 of the Joint TSD.

Ford, Toyota, and the Alliance of Automobile Manufacturers also recommended a number of edits and technical changes to the proposed hybrid procedures and equations: clarification of plus and minus current flows, dropping of incorrect use of battery state of charge, corrected references to other regulation paragraphs, spelling corrections, correction of conflicting nomenclature and units, and use of measured rather than scheduled speed traces. These changes are reflected in Section 5.3.3 of the Joint TSD and in the final regulatory text. Also, in response to comments requesting clarification of how nominal voltage is determined, we are defining nominal voltage as described in section 5.3.3 of the Joint TSD.

Volkswagen is correct that use of stop-start technology has significance under both the off-cycle and full-size truck credit provisions. However, each of these credit programs has its own additional criteria that must be met (such as proof of off-cycle performance, minimum hybrid sales thresholds, and demonstration of hybrid regenerative braking performance). Furthermore, the inclusion of stop-start capability in the hybrid pickup truck definition is intended to help distinguish what is and is not a hybrid. In this broad context it is not meant to be viewed in isolation, as though it justified a portion of the full-size pickup truck credit all by itself and could thereby be construed as double-counted. In fact, of the criteria for qualifying as a hybrid, it is of lesser importance than the recovered energy threshold. This contrasts with the focus of the off-cycle credit for stop-start technology which does not consider energy recovery and usage. Volkswagen also expressed the view that simply introducing regenerative braking on open bed trucks does not comprise a leap forward in automotive technology worthy of credits. We have taken care to adopt meaningful and verifiable criteria for hybrid performance, truck size, and market penetration, to ensure that the credits earned are justified by the technical and marketing challenges involved rather than a superficial offering of a niche product claiming to use hybrid technology.

We disagree with MEMA's view that the credit program's definitions of mild and strong hybrids are too dependent on hybrid architecture. We proposed and are adopting definitions that are not specific to hybrid architecture, and are intentionally kept as simple and technology-neutral as reasonably possible. More broadly, a number of commenters contended that our proposed hybrid credit program effectively amounted to picking technology or fuel-type "winners and losers". We believe that the above-discussed clarification regarding inclusion of non-gasoline hybrids, as well as the inclusion of the two performance-based credit options (with identical credit amounts as the hybrid provisions), delivers a program that is fundamentally fuel- and technology-neutral. We note in response to comments from the natural gas industry in particular that, in addition to the natural gas vehicle multiplier, full-size natural gas pickup trucks are eligible for both the hybrid and performance-based credits in the same way that gasoline vehicles are.

Minimum Market Penetration Thresholds

EPA received comments from NRDC in support of the proposed minimum penetration thresholds. Adverse comments came primarily from manufacturers arguing that the thresholds should be reduced or eliminated. These commenters felt that the requirements run counter to the agencies' goal of creating incentives for technology introduction, because they add uncertainty over whether the investment in a technology, a commitment that is made years ahead of time, will reap the credits if sales fall short of the minimum in a model year. These commenters also noted that new technologies are often phased in at rates lower than the proposed minimum penetration rates in order to gauge consumer interest and acceptance. GM specifically objected to the proposed rapid ramp up of the mild hybrid penetration rate as not being aligned with historic rates of customer acceptance of new and/or advanced technologies. GM requested that the levels be instead cut in half to match those proposed for the "15 percent better" performance-based credits.

Our reason for setting ambitious market penetration thresholds remains-- our goal is to create an incentive for manufacturers to commit to the large-scale application of hybrids and other advanced technologies in the challenging large truck sector and specifically that at least mild hybrid or comparable technology becomes a standard technology feature for large pickup trucks. Eliminating or greatly tempering the minimum penetration requirements might retain the incentive for niche applications but would lose any assurance of widespread "game-changing" technology introduction and substantial penetration. We do agree with comments that the ambitious penetration levels proposed for mild hybrid credits in the initial model years may be counter-productive, as launching a complex new technology on almost a third of first-year sales could be a risky business strategy in this highly competitive large truck market segment. As a result, we are scaling this requirement back to 20 and 30% in model years 2017 and 2018 (compared to the proposed levels of 30 and 40% in MY 2017 and 2018, respectively), to help facilitate the smooth introduction of mild hybrid technology. However, we are retaining the substantial penetration requirements that were proposed for later model years to maintain our focus on encouraging this technology to be more or less standard on large trucks. We note that a manufacturer that is unable to meet these penetration requirements may continue to generate credits through the 2021 model year for mild hybrid trucks under the performance-based credit option, assuming the less aggressive penetration threshold requirements for the performance-based credit provision are satisfied.

Concerns that consumer acceptance uncertainty existing today makes it challenging for manufacturers to plan for the sales ramp-ups required under the thresholds are reasonable, but the large ramp-ups are only required for the less risky credit options – mild hybrid and 15% performance improvement – and we feel that such widespread penetration of these more modest technologies is far from out of reach in this timeframe. The issue also tends to be self-limiting; that is, even if we were to entirely drop the thresholds, marginal sales would yield only marginal credit production and thereby make the credit program inconsequential for a manufacturer.

Toyota's view that *maximum* sales thresholds are more appropriate than minimum sales thresholds because credits are not warranted once a technology has largely phased in is, we believe, better addressed through the limiting of credit availability to certain model years, and to a shorter period (through MY 2021) for the less challenging credit options.

Credit Fungibility and Available Model Years

Volkswagen commented that any HEV or performance-based credits generated by large trucks should not be transferable to other vehicle segments, arguing that if compliance for the large truck segment is really as challenging as predicted, there should be no excess of credits to transfer anyway. This may be the case, but we do not agree that it argues for restricting the use of large pickup truck credits. We think the sizeable technology hurdle involved and the limited model years in which credits are available preclude the potential for credit windfalls. Furthermore, neither the size of the large truck market nor the level of the per-vehicle credit are so substantial that they could lead to a large pool of credits capable of skewing the competition in the lighter vehicle market. As described in Preamble Section III.D, EPA will continue to monitor the net level of credit transfers from cars to trucks and vice versa in the MYs 2017-2025 timeframe.

ICCT opposed allowing vehicle models that earn performance-based credits in one year to continue receiving them in subsequent years as the increasingly more stringent standards progressively diminish the vehicle's performance margin compared to the standard. We view the incentive over the longer term, as a multi-year package, intending it to encourage investment in lasting technology shifts. The fact that it is somewhat easier to exceed performance targets by 15 or 20% in the earlier years, when the bar is set lower, and, once earned, to retain that benefit for a fixed number of years (provided sales remain strong), works to focus the credit as intended—on creating an incentive for the introduction of new technology as early in the program as possible. The mild hybrid credit is available only through MY 2021 because the penetration threshold is high enough by then (80%) to essentially constitute fleetwide application of the technology.

VNG questioned the 5-year limit on availability of the 20 g/mi performance-based credit, given that the corresponding strong hybrid credit has no such limit. The 5-year limit is intended to deal with the general nature of the performance-based credit, which does not involve any requirement to identify what technology package is being applied to earn the credit. The vehicle design may evolve somewhat in this 5-year period (corresponding to a typical redesign cycle) without voiding the credit, unless CO_2 emissions increase. A major vehicle redesign triggers eligibility for a new 5-year eligibility period (but not past the 2025 model year). No such artificial construct is needed in the case of hybrids, as the "game changing" technology being introduced (hybrid-electric) is clear.

We agree with MEMA that, although full-size pickup truck technology credits are not available in model years 2014-2016, credit for "early compliance" is provided in that these pickups can still generate credits like any other vehicle in model years 2014-2016, and these credits can be carried forward and used in later model years.

6. GHG Emissions Compliance Treatment of Plug-In Hybrid Electric, Compressed Natural Gas, Ethanol, Diesel, and Other Alternative Fueled Vehicles, and CAFE Issues

Introduction

EPA received a very large set of comments with respect to issues associated with the compliance treatment for vehicles that can run on fuels other than gasoline. Section 4 addresses those comments that primarily focus on specific issues associated with GHG emissions incentives for EVs, PHEVs, and FCVs. This section addresses those comments that primarily relate to the use of utility factors for PHEVs, as well as all comments that primarily focus on compressed natural gas, ethanol, diesel, and other alternative fuels. In this section, the comments are divided into five sub-sections: PHEVs (6.1), CNG (6.2), ethanol (6.3), diesel (6.4), and other alternative fuels and miscellaneous comments (6.5). In addition, there is a sixth sub-section (6.6) that contains no unique comments, but which addresses issues that are relevant to multiple fuels, including CAFE issues (issues discussed here are often included in comments throughout the rest of this section). Many comments raise issues relevant to multiple sub-sections of this section as well as to Section 4, so readers interested in a comprehensive treatment of comments on alternative fuel vehicles should read the comments and responses in both sections, as well as the relevant preamble discussions. In addition, comments related to gasoline fuel quality in general, and to ethanol/gasoline blends in particular, are addressed in Section 11.

6.1. Plug-In Electric Vehicles

Organizations Included in this Section

American Council for an Energy-Efficient Economy (ACEEE)
American Petroleum Institute (API)
Electric Drive Transportation Association (EDTA)
Fisker Automotive, Inc.
Motor & Equipment Manufacturers Association (MEMA)

Organization: American Council for an Energy-Efficient Economy (ACEEE)

For PHEVs, EPA proposes to use cycle-specific utility factors (UFs) for determining electricity use (NPRM p.75018), which we support. EPA also references the fuel economy and environmental labeling rule in this context, which raises questions about the details of the approach. First, an important step in calculating realistic UFs is applying the shortfall correction to the fuel economy test values, or more specifically the miles traveled in charge depleting mode. While this is part of the calculation used for labeling purposes, EPA does not indicate in the NPRM that any such adjustment is to be made for purposes of the fuel economy and GHG emissions rule. While we understand that the EPA does not contemplate switching to “real-world" emissions rates for purposes of this rule, failure to adjust charge-depleting range will lead to utility factors that are far too high. Also, while the labeling rule uses Multi-Day Individual Utility Factors (MDIUFs), this rule should instead use the lower Fleet UFs, which will better capture the expected use of petroleum by the fleet of PHEVs. Information on the values of the UFs used to evaluate the performance of each PHEV model under the rule should be publically available. EPA-HQ-OAR-2010-0799-9528-A2, p.9]

EPA proposes a lower bound of 10.2 miles for the "all-electric range" of a PHEV to receive the special treatment accorded to EVs (for electric operation only). While we do not object to this proposal, we believe that, to be treated as an FFV for CAFE purposes prior to 2020, this range is not sufficient. A PHEV with an all-electric range of 10 miles has a UF of under 25 percent, yet would be treated for CAFE purposes as if it were driven half of the time on electricity. Moreover, CAFE credits generated by PHEV FFVs, unlike those generated by FFVs of other types, are not capped. Hence PHEVs should only be treated as FFVs if they can be expected to drive half the time on electricity. On the other hand, PHEVs that drive more than half the time on electricity would be disadvantaged by their treatment as FFVs. This problems would best be solved by advancing the use of UFs to determine the fuel economy of PHEVs to MY2017. EPA-HQ-OAR-2010-0799-9528-A2, p.9]

Organization: American Petroleum Institute (API)

Comments on the Proposed Approach to Measure Compliance with Fuel Economy and GHG Standards for Dual-Fuel CNG vehicles

EPA and NHTSA note that the statutory incentive for dual-fueled vehicles in 49 U.S.C 32906 and the measurement methodology specified in 49 U.S.C 32905 (b) and (d) expire in MY 2019 and request comment on proposed options going forward. The agencies are proposing to directly extend the PHEV utility factor methodology to dual-fuel CNG vehicles, using the same assumptions about daily refueling. Under the utility factor approach, the vehicle range on the alternative fuel would be used to estimate the fraction of average daily travel that the range represents based on SAE Standard J2841. For example, a plug-in hybrid electric vehicle (PHEV) with an all-electric range of 40 miles would be assigned a utility factor of 0.617, while a dual-fuel natural gas vehicle (NGV) with a range on natural gas of 150 miles would be assigned a utility factor of 0.925. [EPA-HQ-OAR-2010-0799-9469-A1, p. 7]

We have several concerns with this proposed approach. First, it relies on the implicit assumption that the driving behavior of owners/operators of PHEVs is identical to that of owners/operators of dual-fuel CNG vehicles; an assumption which we do not believe is (or has been) demonstrably supported by any underlying data, yet should be. (A related question is whether the driving behavior and vehicle use characteristics of that element of the population sometimes termed "early technology adopters" is similar to, or different than, the "national average" database of travel characteristics from which the Utility Factors were created.)13 Second, although the use of the utility factor is an improvement over the simple 50/50 split used previously, this approach inherently assumes that the vehicle begins each day with a full state of charge (PHEVs) or a full natural gas tank (NGVs). It is unclear that this will occur in practice, and it may significantly overestimate the calculated benefits of the alternative fuel. Additionally, the vehicle range on the alternative fuel is established based on 2-cycle testing (i.e., the FTP and the highway fuel economy test) that is used to determine compliance with the CAFE and GHG standards. This clearly overestimates the range on the alternative fuel, and the proposed rule should be revised to reflect real-world vehicle range based on 5-cycle test results or other data that better represent real-world performance. This is not at all inconsistent with the use of 2-cycle tests for CAFE and GHG emissions compliance, as the real-world range would only be used to establish the appropriate utility factor, which, in turn, was based on real-world driving statistics. [EPA-HQ-OAR-2010-0799-9469-A1, pp. 6-7]

Organization: Electric Drive Transportation Association (EDTA)

4. Use of SAE J2841 to Determine Utility Factor for PHEVs

EPA is proposing to use the utility factor methodology developed by the Society of Automotive Engineers (SAE) in the publication SAE J2841, “Utility Factor Definitions for Plug-In Hybrid Electric Vehicles Using Travel Survey Data”(Sept. 2010). EPA first adopted SAE J2841 in its July 2011 final rule on vehicle labeling requirements. [EPA-HQ-OAR-2010-0799-9449-A1, p. 7]

EDTA recognizes the need for a utility factor as a means of estimating the portion of the driving cycle that involves electric-only operation. EDTA supports using the utility factor methodology adopted by the SAE in the publication J2841. EDTA also supports use of a unique utility factor for each vehicle model, taking into account the characteristics of the vehicle and the expecting operating and charging behavior of the users of that type of vehicle. [EPA-HQ-OAR-2010-0799-9449-A1, p. 7]

EDTA urges EPA to ensure that each manufacturer is given an appropriate opportunity to provide input into the development of the utility factor for that manufacturer’s PHEV models, including notice of the proposed utility factor and an opportunity to submit comments prior to final adoption of that utility factor. [EPA-HQ-OAR-2010-0799-9449-A1, p. 7]

Organization: Fisker Automotive, Inc.

Support the continued use of the utility factor (UF) approach in calculating GHGs and support the adoption of this approach for CAFE calculation as proposed

Fisker believes the utility factor approach is a fair means of weighting the fraction of driving performed in electric and gasoline modes. We believe this approach is based on a more robust set of assumptions than the current 50-50 weighting in the dual-fuel vehicle approach used currently by CAFE standards, so we encourage the application of the utility factor to CAFE standards as soon as possible. [EPA-HQ-OAR-2010-0799-9266-A1, p. 5]

Organization: Motor & Equipment Manufacturers Association (MEMA)

On Page 75018, Col. 2 of the NPRM, “Based on this utility factor approach, EPA calculates the GHG emissions compliance value for an individual PHEV as the sum of (1) the GHG emissions value for electric operation … multiplied by the utility factor, and (2) the tailpipe CO_2 emissions value on gasoline multiplied by (1 minus the utility factor).” Please confirm in the final rule that where a PHEV has a diesel engine, that the calculation would also apply to diesel. In other words, it is not just limited to gasoline. If that is indeed the case, the agencies should consider revising that to read “gasoline/diesel.” (Please refer to Section VIII.C. for explanation.) [EPA-HQ-OAR-2010-0799-9478-A1, p.12]

Response:

Issues related to incentives for PHEVs are discussed in Section 4. This sub-section addresses issues related to EPA’s adoption of utility factors to weight electricity and gasoline GHG emissions in PHEV compliance calculations.

See Preamble Section III.C.4.a.i for a discussion of why the Agency is adopting the cycle-specific fleet-based utility factors as developed by the Society of Automotive Engineers (SAE). Commenters raised a few additional issues that were not addressed in Preamble Section III.C.4.a.i.

ACEEE and API suggested that PHEV utility factors should be based on 5-cycle range rather than 2-cycle range. EPA agrees that this would be a reasonable approach, but EPA is retaining the 2-cycle basis at this time because the limited real-world data on electricity and gasoline operation from the Chevrolet Volt suggests that the utility factors based on 2-cycle range appear to be closer to the real world experience than lower utility factors based on 5-cycle range. Range is just one of many assumptions involved in the utility factor methodology, and EPA commits to monitoring real world data from PHEV operation to evaluate the overall appropriateness of the SAE utility factors based on 2-cycle range.

EDTA suggested a notice and opportunity process for EPA calculation of PHEV utility factors. While EPA believes it is neither necessary nor efficient to implement a formal notice and opportunity process, EPA does commit to working closely with manufacturers to explain how we apply the utility factor regulations to individual vehicles.

Finally, in response to the MEMA comment, EPA will develop GHG emissions compliance values for all PHEVs the same way, regardless of whether the PHEV internal combustion engine operates on gasoline, diesel, or any other fuel.

6.2. Compressed Natural Gas Vehicles

Organizations Included in this Section

Alliance of Automobile Manufacturers
America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)
American Clean Skies Foundation (ACSF)
American Honda Motor Co., Inc.
American Petroleum Institute (API)
American Public Gas Association (APGA)

Association of Global Automakers, Inc. (Global Automakers)
Boyden Gray & Associates PLLC
Chrysler Group LLC
Clean Energy
Edison Electric Institute (EEI)
Encana Natural Gas Inc.
Ford Motor Company
Manufacturers of Emission Controls Association (MECA)
Mercedes-Benz USA, LLC
National Propane Gas Association (NPGA)
Natural Resources Defense Council (NRDC)
NGV America
Northeast States for Coordinated Air Use Management (NESCAUM)
Pennsylvania Department of Environmental Protection
Plant Oil Powered Diesel Fuel Systems, Inc.
Toyota Motor North America
Vehicle Production Group LLC (VPG)
VNG Co. (VNG)

Organization: Alliance of Automobile Manufacturers

Dual-Fuel CNG and LPG Gasoline Vehicles [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

CNG and LPG vehicles are another option that our country has to diversify the vehicle fleet and use a domestically available energy source. The Alliance supports the development of a utility factor approach very similar to the SAE standard mentioned above for PHEVs. The Alliance is also in favor of the option to allow manufacturers to use the proposed utility factor-based methodology as a “pull-ahead” option for MYs 2012-2015. [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

Based on the added cost of the vehicle technology and the cost advantage of using CNG and LPG fuel relative to gasoline, customers that purchase a dual-fuel CNG or LPG vehicle will, to the extent possible, use the intended alternative fuel. [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

Many companies may leverage global designs in developing dual-fuel CNG and LPG vehicles for the U.S. market. It is important that the variety of global design features available be allowed into the U.S. market. Rather than making specific design requirements in the rules, a better approach would be have these design features be factors in the calculation of the CNG and LPG utility factors. The Alliance would like to propose a work group to discuss the constraints mentioned in the NPRM for dual-fuel CNG and LPG vehicles. [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

In the NPRM, EPA specifically requested comments on the merits of providing sales multiplier (similar to the EV/PHEV incentives) for dedicated and/or dual-fuel compressed natural gas vehicles. The Alliance believes CNG and LPG technology also deserve multipliers. [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

Organization: America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)

I. NATURAL GAS VEHICLES FULFILL EACH OF THE GOALS OF THIS PROGRAM

The Presidential Memorandum calling for this program stated that its goals were “to improve fuel efficiency and to reduce greenhouse gas emissions of passenger cars and light-duty trucks of model years 2017–2025’’, and thus take advantage of an “opportunity to lead the world in the development of a new generation of clean cars and trucks through innovative technologies and manufacturing that will spur economic growth and create high-quality domestic jobs, enhance our energy security, and improve our environment.’’ Presidential Memorandum Regarding Fuel Efficiency Standards, May 21, 2010, as cited in 76 FR 74862. [EPA-HQ-OAR-2010-0799-9548-A1, p. 2]

Cognizant of this opportunity, EPA and NHTSA throughout the Light Duty Rule emphasize the importance of the economic impact of these regulations, noting, e.g., that they will “achieve important reductions in GHG emissions and fuel consumption from the light duty vehicle part of the transportation sector, based on technologies that either are commercially available or that the agencies project will be commercially available in the rulemaking timeframe and that can be incorporated at a reasonable cost.” 76 FR 74858. See also id. at 74859-60 (same); id. at 74962 (“This proposal provides important benefits to society and consumers in the form of reduced emissions of greenhouse gases (GHGs), reduced consumption of oil, and fuel savings for consumers, all at reasonable costs.”) Indeed, the agencies estimate that the benefits of this program outweigh the costs by hundreds of billions of dollars. Id. at 74890. [EPA-HQ-OAR-2010-0799-9548-A1, p. 2]

By requesting comment on incentives for natural gas vehicles (“NGVs”) (discussed more fully in Section II, below), the agencies seem to acknowledge that NGVs can meet the goals of reducing both GHG emissions and increasing use of alternatives, in addition to reduced emissions of criteria pollutants, while also serving to “spur economic growth” and “create high-quality domestic jobs” as the President called for. In fact, in his January 24, 2012 State of the Union address, the President repeatedly invoked both the environmental and economic advantages of domestic natural gas, e.g., “The development of natural gas will create jobs and power trucks and factories that are cleaner and cheaper, proving that we don’t have to choose between our environment and our economy.” [Section II can be found on p. 6 of Docket number EPA-HQ-OAR-2010-0799-9548-A1] [EPA-HQ-OAR-2010-0799-9548-A1, p. 2]

What the agencies may not have recognized is that NGVs are, in fact, both the single most cost-effective means of achieving these goals in the transportation sector and, if encouraged, will create more jobs and economic growth than any other proposed solution. [EPA-HQ-OAR-2010-0799-9548-A1, p. 2]

A. Natural Gas Vehicles Will Strengthen the U.S. Economy by Utilizing More Domestically Produced Resources and Creating Domestic Jobs

Increasing use of domestically produced natural gas is essential to help reduce U.S. dependence on foreign sources of energy from geopolitically unstable regions of the world. Despite 35 years of rising imports and the agencies' admission that "the need to reduce energy consumption is more crucial today than it was when the Energy Policy and Conservation Act was enacted in the mid-1970s" (Interim Joint Technical Assessment Report, "JTAR", p. 1-1), the Light Duty Rule continues to emphasize a policy of incremental improvements in fuel economy. Ignoring a domestically-produced transportation fuel in favor of marginal gains in petroleum fuel economy is a shortsighted energy security policy. As the U.S. Energy Information Agency points out, in 2035 the U.S. is still expected to import 16.71 QBtus of oil, down only 17% from the 20.14 QBtus imported in 2010. EIA, AEO 2012 Early Release Summary, Table AI, attached as Exhibit 1. Reducing imports by less than 1% a year is too little, too late. [EPA-HQ-OAR-2010-0799-9548-A1, p. 3]

These are the facts, and that means that fuel switching is the only realistic pathway to energy security. Each NGV totally displaces a gasoline vehicle's lifetime need for petroleum, and as the agencies acknowledge, "each gallon of fuel saved as a consequence of the GHG and fuel efficiency standards is anticipated to reduce total U.S. imports of petroleum by 0.95 gallon." 76 FR at 75135. And the most abundant, efficient and secure replacement fuel is natural gas. The U.S. and Canada supply 99% of U.S. natural gas demand, and U.S. gas reserves are growing. [EPA-HQ-OAR-2010-0799-9548-A1, p. 3]

U.S. Natural Gas Supplies

The U.S. has enormous natural gas supplies; as the President correctly pointed out in his State of the Union Address, "We have a supply of natural gas that can last America nearly 100 years." Indeed, multiple experts agree, the U.S. has enough natural gas to meet growing demand for generations to come.[1] [EPA-HQ-OAR-2010-0799-9548-A1, p. 3]

In its 2009 Report addressing the supply of technically recoverable natural gas in the United States, the Potential Gas Committee reported that the currently available total supply of natural gas was 1,836 trillion cubic feet ("Tcf"), which represented an increase of 39% (516 Tcf) over the Committee's year end estimate for 2006. Potential Gas Committee, Potential Supply of Natural Gas in the United States (December 31, 2008) (June, 2009). [EPA-HQ-OAR-2010-0799-9548-A1, p. 3]

The Potential Gas Committee is not alone in its estimates. MIT's Future of Natural Gas (Interim Report) also reviewed U.S. gas resource estimates from several sources, including the Potential Gas Committee, and assumed a mean remaining resource base of approximately 2,100 Tcf. Id., p. 9. This means that at current levels of consumption the U.S. has more than enough domestic natural gas to fuel the light-duty fleet. [EPA-HQ-OAR-2010-0799-9548-A1, p. 4]

The Economic Advantages of Natural Gas as a Transportation Fuel

Increasing our reliance on domestically produced sources of energy such as natural gas helps increase more than US energy security – it benefits our economy as well. According to the Department of Commerce, the U.S. trade deficit for 2011 was $558 billion, during which time the U.S. imported $432 billion of foreign petroleum. U.S International Trade Statistics, attached as Exhibit 2. [EPA-HQ-OAR-2010-0799-9548-A1, p. 4]

In contrast, producing and distributing natural gas as a transportation fuel means keeping this money at home and creating American jobs. In 2008, U.S. production of 20 Tcf of natural gas created more than 1.3 million jobs, and even a modest increase in demand for natural gas as a transportation fuel could create tens of thousands of additional jobs. "The Contributions of The Natural Gas Industry to the U.S. National and State Economies", IHS Global Insight, 2009, p.1, attached as Exhibit 3. The rapid growth in shale gas alone supported 600,000 jobs in 2010, a number expected to grow to nearly 870,000 in 2015. IHS Global Insight 2011, p. 1, attached as Exhibit 4. A significant push to increase NGVs in the U.S. also would create thousands of additional jobs related to manufacturing natural gas vehicles and building the relevant infrastructure. [EPA-HQ-OAR-2010-0799-9548-A1, p. 4]

Finally, we note that natural gas vehicles are just as available as natural gas itself. There are more than 12 million NGVs on the road worldwide, and a recent report forecast 28 million NGVs by 2015 (Global Industry Analysts, Inc.). Outside the U.S., NGVs are made by, among others, Ford, GM, Toyota, Honda, Nissan, Hyundai, Fiat, Volkswagen and Mercedes. Demand for U.S. NGVs would thus give domestic manufacturers a base upon which to build an export market. And another economic opportunity exists in converting existing petroleum vehicles to run on natural gas, yet another well-established technology that can further job creation here at home. [EPA-HQ-OAR-2010-0799-9548-A1, p. 4]

In sum, the only way to fulfill the statutory mandate of reducing U.S. dependence on foreign sources of energy is by beginning to move the U.S. light-duty vehicle fleet to natural gas as a complement to other advanced technology and alternative fuel vehicles, a policy which will also significantly assist the U.S. economy. [EPA-HQ-OAR-2010-0799-9548-A1, p. 4]

B. NGVs are the Most Cost-Effective Means of Reducing Light-Duty GHG Emissions [EPA-HQ-OAR-2010-0799-9548-A1, p. 4]

Each NGV not only utilizes a domestic alternative fuel source, but also has inherently lower GHG emissions. On a lifecycle basis (accounting for upstream emissions), NGVs have 30% lower GHG emissions than their gasoline-powered counterparts. California Energy Commission, Full Fuel Cycle Assessment, p. 30, attached as Exhibit 5. Apropos of lifecycle emissions, AGA and ANGA agree with EPA's position that full lifecycle accounting is necessary for determining both actual emissions reductions and vehicle compliance. 76 FR 75011. [EPA-HQ-OAR-2010-0799-9548-A1, pp. 4-5]

Moreover, natural gas is getting even cleaner, as renewable natural gas (biomethane from landfills and other sources) comes on line. Biomethane achieves nearly a 90 percent reduction in GHGs compared to gasoline, and U.S. biomethane production is increasing, with DOE's National Renewable Energy Laboratory estimating future production of up to 16 billion gasoline gallons equivalent. 74 FR 24982. [EPA-HQ-OAR-2010-0799-9548-A1, p. 5]

Not only will natural gas continue to reduce its GHG emissions, but the efficiency of natural gas vehicles will also continue to improve as the result of technological advances. In fact, NGVs will benefit equally from the very same technological advances the agencies say are available for gasoline vehicles to meet the proposed standards. The vast majority of these improvements, whether “vehicle technology”, “transmission technology”, “engine technology” or “vehicle electrification” can be used on NGVs to further lower their GHG emissions. Mass and drag reduction, low-friction lubricants, cylinder deactivation, variable valve timing, continuous variable transmissions, hybridization, etc., will have the exact same effect of reducing fuel consumption for NGVs as they do for petroleum ones. [EPA-HQ-OAR-2010-0799-9548-A1, p. 5]

Moreover, NGVs are not subject to the trade-off between greater fuel economy and lower safety considerations imposed by light-weighting or down-sizing vehicles. Of note, the JTAR presents mass reduction as the single largest component for increasing petroleum fuel economy and reducing GHG emissions (J-TAR Chapter 6, passim.) but at the same time admits that “the agencies believe that the effects of vehicle mass reduction on safety should be evaluated from a societal perspective (including an analysis of fatalities and casualties.)” JTAR 3-8. NGVs weigh somewhat more than comparable gasoline vehicles due to the weight of the CNG tanks, yet even with this weight penalty NGVs continue to reduce GHG emissions while utilizing an alternative fuel source. (Compare Honda CNG curb weight of 2,848 lbs with Honda Civic LX curb weight of 2721 lbs.) [EPA-HQ-OAR-2010-0799-9548-A1, p. 5]

II. INCENTIVES FOR NGVS

EPA has proposed not only extending the current incentives for electric vehicles (“EVs”), under which the agency deems them to have zero GHG emissions, but to add a second category of incentives for MY 2017-2021 under which each EV (and fuel cell vehicle) sold would be deemed to be equal to between 2.0 such vehicles (MY 2017- 2019) 1.75 vehicles (MY 2020), and 1.5 vehicles (MY 2021). Plug-in hybrid electric vehicles (“PHEVs”) would get similar, but smaller, multipliers: 1.6 for MY 2017-2019, 1.6 for MY 2020, and 1.3 for MY 2021. 76 FR 75013. EPA’s rationale for these incentives is that “it is appropriate to encourage the initial commercialization of EV/PHEV/FCVs as well, in order to retain the potential for game-changing GHG emissions and oil savings in the long term.” Id. at 75011. [EPA-HQ-OAR-2010-0799-9548-A1, p. 6]

EPA then asks for “comments on the merits of providing similar multiplier incentives to dedicated and/or dual fuel compressed natural gas vehicles”. Id. at 75013. While EPA proposes generous incentives for EVs and PHEVs because they represent “potential for game-changing GHG emissions and oil savings in the long term”, both dedicated and dual-fuel NGVs represent actual “game changing GHG emissions and oil savings” right now that justify comparable incentives. Moreover, considering NGVs superior cost-benefit performance in reducing GHGs compared to EVs, EPA should consider an even larger multiplier incentive, perhaps equal to the incentive Congress mandated for NGVs based on their oil-displacement performance. [EPA-HQ-OAR-2010-0799-9548-A1, p. 6]

According to EPA, the 2012 Nissan Leaf EV has upstream GHG emissions of 161 grams per mile. Id. at 75011. If the Leaf were gasoline-powered, the proposed 2017 GHG standard for it would be 210 g/mi.[2] Assuming, as EPA does (id. at 75011), a 20% upstream GHG value for gasoline vehicles (42 g/mi), this “gasoline Leaf” would have total GHG emissions of 252 g/mi. Thus the actual GHG emissions difference between the EV Leaf and the gasoline Leaf is 252-

161, or 91 g/mi. Using EPA's figures, simple math shows that the cost of this 91 g/mi advantage is a staggering $304 for each g/mi improvement over the comparable gasoline vehicle. [EPA-HQ-OAR-2010-0799-9548-A1, p. 6]

EPA expects that in 2016, the marginal cost of EV technology for a small size car (such as the Leaf) to be $27,628. Draft Joint Technical Support Document, Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, September 2009, p. 3-91. Conservatively assuming that the cost of EV technology in the 2012 Leaf is no more than EPA's estimate for 2016, $27,628 divided by 91 equals a cost of approximately $304 per g/mi of GHG reductions. [EPA-HQ-OAR-2010-0799-9548-A1, pp. 6-7]

In contrast, a 2011 Honda Civic NGV vehicle has tailpipe CO_2 emissions of 252 g/mi, and the comparable 2011 Honda Civic gasoline vehicle has tailpipe emissions of 306 g/mi. www.fueleconomy.gov. Even without including the NGV's smaller upstream GHG emissions, the NGV has 54 g/mi less GHG emissions than its gasoline counterpart, and costs $6,935 more. Thus the cost of achieving GHG reductions via an NGV is only $128 per g/mi. In other words, compared to electric vehicles, NGVs are close to three times more cost efficient in reducing GHG emissions. [EPA-HQ-OAR-2010-0799-9548-A1, p. 7]

Given this, AGA and ANGA believe that it would be reasonable for EPA to not only include incentives for NGVs, but to make them significantly larger than the ones proposed for EVs. Because the Light Duty Rule is a joint regulatory program designed to reduce both GHGs and oil dependency, the most logical basis for an incentive is the one Congress has already mandated for NGVs based on their displacement of oil imports. [EPA-HQ-OAR-2010-0799-9548-A1, p. 7]

In the Alternative Motor Fuels Act of 1988 ("AMFA"), Congress wrote a specific compliance metric favoring natural gas and other alternative fuels into the light-duty fuel economy statute. The Conference Report for AMFA could not have been clearer: "[t]he objective of both the House and Senate bills is to facilitate the development and use of alternative fuels in the United States for purposes of energy security" (House Report 100-929, 134 Cong Rec H 7732, September 16, 1988, p. 7736), and the first two legislative findings in the statute itself were "the achievement of long-term energy security for the United States is essential to the health of the national economy, the well-being of our citizens, and the maintenance of national security" and "the displacement of energy derived from imported oil with alternative fuels will help to achieve energy security and improve air quality." P.L. 100-494, Section 2. [EPA-HQ-OAR-2010-0799-9548-A1, p. 7]

Recognizing that every NGV increases utilization of a domestically produced alternative fuel, in AMFA Congress encouraged the production of natural gas vehicles by multiplying the fuel economy of an NGV relative to that of an equivalent gasoline-powered one. (AMFA Section 6(a), codified at 49 U.S.C. 32905(c), providing that in fuel-consumption calculations, "[a] gallon equivalent of gaseous fuel is deemed to have a fuel content of .15 gallon of fuel"; by multiplying natural gas volume by .15, the effect of this is to discount NGV fuel consumption by 85%.)

Based on the fact that NGVs are more cost-efficient than EVs in delivering GHG reductions, and that Congress mandated an incentive multiplier for NGVs of approximately 7 for their fuel-economy benefits, AGA and ANGA believe that an incentive multiplier that provides parity with electric and plug-in hybrid vehicles is justified for NGVs. [EPA-HQ-OAR-2010-0799-9548-A1, p. 7]

Using the equivalent multiplier for GHGs allows for full recognition of NGV fuel-economy benefits. However, any GHG multiplier that is less than the fuel economy one essentially negates the Congressional mandate in AMFA to the extent of that difference, a result at odds with the very purpose of this joint rulemaking. We strongly encourage EPA to take into account the fuel economy goals of this joint program in crafting their GHG standards, and the fact that NGVs are more cost-effective than EVs in reducing GHGs should allow for EPA to establish a GHG multiplier incentive equivalent to the Congressionally-mandated fuel economy incentive. [EPA-HQ-OAR-2010-0799-9548-A1, p. 8]

Dual-Fuel NGVs

As described in detail below, AGA and ANGA support EPA's proposal to "directly extend" to dual fuel CNG vehicles the PHEV utility factor methodology described in SAE J2841 ''Utility Factor Definitions for Plug-In Hybrid Electric Vehicles Using Travel Survey Data,'' September 2010. AGA and ANGA also support extending application of this utility factor methodology back to MY 2012-2016. [EPA-HQ-OAR-2010-0799-9548-A1, p. 9]

We agree with EPA's conclusion that "owners of dual fuel CNG vehicles will preferentially seek to refuel and operate on CNG fuel as much as possible" because, in part, "CNG fuel is considerably cheaper than gasoline on a per mile basis". 76 FR 75018. In fact, on a per-mile basis, CNG retails for approximately one-third to one-half the cost of gasoline. However, we note that another basis for EPA's conclusion ("because the owner paid a much higher price for the dual fuel capability", id.) is somewhat of a conjecture, as no manufacturer has yet to produce a duel fuel NGV. [EPA-HQ-OAR-2010-0799-9548-A1, p. 9]

AGA and ANGA also agree with EPA's observation, which further supports use of the SAE utility factor, that "many dual fuel CNG vehicles will likely have smaller gasoline tanks given the expectation that gasoline will be used only as an 'emergency' fuel". However, we believe that this is precisely what the market will produce, and thus do not believe that there is need for any of the agency's suggested "additional constraints on the designs of dual fuel CNG vehicles to maximize the likelihood that consumers will routinely seek to use CNG fuel", such as "placing a minimum value on CNG tank size or CNG range, a maximum value on gasoline tank size or gasoline range, a minimum ratio of CNG-to-gasoline range, and requiring an onboard control system so that a dual fuel CNG vehicle is only able to access the gasoline fuel tank if the CNG tank is empty." Id. at 75019. [EPA-HQ-OAR-2010-0799-9548-A1, p. 10]

EPA notes that the same SAE utility factor it proposes to apply to dual fuel NGVs is the one first developed for PHEVs, and that there are two potential differences which "might weaken the case for using utility factors for dual fuel CNG vehicles." AGA and ANGA addressed the first (relating to a dual fuel NGV running on gasoline when both fuels are available on board), above.

The second that “it may be much more inconvenient for some private dual fuel CNG vehicle owners to fuel every day relative to PHEVs, and there are many fewer CNG refueling stations than electrical charging facilities” is not the relevant consideration. Unlike PHEVs, CNG vehicles are exactly like gasoline vehicles insofar as they do not need to refuel every day. Based on NHTSA’s combined cityhighway fuel economy figure (31 mpg) and vehicle tank size, the driving range for the 2012 Honda CNG is 248 miles, which means that, like gasoline vehicles, it would only have to be refueled once every few days. [EPA-HQ-OAR-2010-0799-9548-A1, p. 10]

---

1 Sources:

ICF: As reported in MIT Energy Initiative, 2010, The Future of Natural Gas, interim report; Table 2.1

EIA: See http://www.eia.gov/analysis/studies/worldshalegas/

PGC: Potential Gas Committee’s Advance Summary and press release of its biennial assessment; see www.potentialgas.org

CERA: IHS CERA, 2010, Fueling North America’s Energy Future: The Unconventional Natural Gas Revolution and the Carbon Agenda

MIT: MIT Energy Initiative, 2010, The Future of Natural Gas, interim report

NPC: Realizing the Potential of North America’s Abundant Natural Gas and Oil Resources
Johns Hopkins University ; Prudent Development Study 2011

2 The GHG standard applicable to a vehicle is determined by its “footprint”, which is “the vehicle’s wheelbase multiplied by its track width”. 76 FR 74870. Multiplying the Leaf’s wheelbase of 106.3 inches by its track width of 60.6 inches (http://www.vehix.com/carreviews/2011/nissan/leaf/vehicle-specification) equals 6441.78 sq in, or 44.73 sq ft, and thus a GHG footprint of 210g/mi. Id. at 74873.

Organization: American Clean Skies Foundation (ACSF)

ACSF strongly supports the energy security and environmental goals underlying the Proposed Rule. However, the Foundation believes that these goals can best be met by adopting technology neutral incentives that enable natural gas vehicles (NGVs), as well as electric vehicles (EVs), to play a larger role. Both technologies can deliver similar well-to-wheel greenhouse gas (GHG) emission reductions. See Appendix 1. Accordingly, these comments propose several simple rule changes that EPA and NHTSA can make to establish a level regulatory playing field for advancing cleaner and more fuel-efficient vehicles, rather than arbitrarily providing incentives for selected vehicle powertrains, as the Proposed Rule now does. Consumers and the environment will benefit from competition across vehicle technologies. [Appendix 1 can be found on pp. 16-20 of Docket number EPA-HQ-OAR-2010-0799-9464-A1] [EPA-HQ-OAR-2010-0799-9464-A1, p. 1]

Given the Administration's recognition of the major energy security and emission benefits that NGVs can provide (See Appendix 2), we believe it is essential that any new vehicle standards adopted by EPA and NHTSA are consistent with that vision and, at a minimum, do not discriminate against NGVs or dual-fuel (natural gas/gasoline) vehicles. [Appendix 2 can be found on pp. 21-23 of Docket number EPA-HQ-OAR-2010-0799-9464-A1] [EPA-HQ-OAR-2010-0799-9464-A1, pp. 1-2]

I. Executive summary

The Proposed Rule has two overarching goals: to reduce GHG emissions and improve our nation's security. Encouraging the manufacture and use of more NGVs is one of the very best ways to achieve these goals because each new NGV will emit roughly 30% less GHG pollution than a gasoline vehicle and displace its lifetime consumption of imported petroleum. [EPA-HQ-OAR-2010-0799-9464-A1, p. 2]

The new rule will apply to vehicles manufactured in model years 2017 through 2025. This is a critical period for deploying alternative fuel vehicles, as it represents a key window of opportunity to make progress on environmental and security goals. Any new regulations that impact vehicle fuel choices and related infrastructure investments will also have far-reaching impacts on the country's transportation mix well before 2017 and after 2025. That is why it is so important that the proposed rule not handicap one category of oil-saving or lower carbon vehicle technologies versus another. [EPA-HQ-OAR-2010-0799-9464-A1, p. 2]

Unfortunately, however, in providing incentives for alternative fuel vehicles, the draft rule unduly favors EVs to the detriment of NGVs. This shortcoming can and must be addressed to create effective competition among alternative fuel vehicles and provide technology-neutral incentives. [EPA-HQ-OAR-2010-0799-9464-A1, p. 2]

To that purpose, ACSF recommends the following rule changes:

1. A technology-neutral pool of alternative fuel vehicle incentives should be created. All qualified alternative fuel vehicles, including EVs and NGVs, should qualify for these incentives which would use a multiplier to give extra credit for the emission reduction benefits of such vehicles in calculating each manufacturer's fleet averages. The incentive would be phased out when the annual sales of all qualified alternate fuel vehicles exceeds 10% of total vehicle sales, or roughly 1.5 million vehicles in 2017. [EPA-HQ-OAR-2010-0799-9464-A1, p. 2]

2. Because production volumes can be rapidly scaled-up, EPA should augment the near-term incentives for natural gas dual-fuel vehicles. As with hybrid electric vehicles, the increased production of NGVs that can run on both gasoline and CNG as 'dual-fuel vehicles' will significantly advance the objectives of the Proposed Rule. [EPA-HQ-OAR-2010-0799-9464-A1, p. 2]

3. Manufacturers producing NGVs and alternative fuel vehicles that use fuels having superior energy security benefits should be explicitly rewarded. Promoting the goal of energy security requires explicit targeted incentives. This might be done by using a common metric (e.g., imported oil reduced) to rank vehicles and/or fleets and provide a proportionate compliance benefit. [EPA-HQ-OAR-2010-0799-9464-A1, p. 2]

The rationale for these recommendations is discussed below. To provide context, we first provide an NGV 'technology overview' and review certain risks regarding EV deployment. We also briefly summarize the Proposed Rule's regulatory structure as it applies to alternative fuel vehicles. [EPA-HQ-OAR-2010-0799-9464-A1, p. 3]

II. Technology overview

A. The benefits and worldwide market acceptance of NGVs.

Only last month, President Obama used his 2012 State of the Union speech to call attention to America's 'nearly 100 year' supply of natural gas and the major role gas can play in enhancing our energy security and reducing GHG emissions. Later he challenged a Nevada audience to: [EPA-HQ-OAR-2010-0799-9464-A1, p. 3]

'Think about an America where more cars and trucks are running on domestic natural gas than on foreign oil. Think about an America where our companies are leading the world in developing natural gas technology and creating a generation of new energy jobs. . .. [L]et's get more of these natural gas vehicles on the road.” [EPA-HQ-OAR-2010-0799-9464-A1, p. 3]

We agree. That is why it is so important that the Proposed Rule promote the President's policy and be technology neutral so that the rules encourage manufacturers to produce more NGVs and dual-fueled vehicles (as well as EVs) capable of delivering similar environmental and security benefits. [EPA-HQ-OAR-2010-0799-9464-A1, p. 3]

NGVs provide a means to achieve the Proposed Rule's emission reduction and energy security goals with proven, cost-effective technology 5 that has been widely deployed around the globe. More than 12 million NGVs were in use worldwide as of 2010,6 far greater than EV deployment.7 In fact, a recent study by Harvard University noted that 'highway-capable BEVs [Battery-Electric Vehicles] are not yet in widespread use anywhere in the world.”8 [EPA-HQ-OAR-2010-0799-9464-A1, pp. 3-4]

In the United States, NGVs are widely recognized as providing 'game changing' opportunities today for vehicle fleets, reducing both costs and emissions and the use of foreign petroleum. There are now over 70,000 CNG vans, light duty trucks and cars in service, including more than 3,000 NGVs in AT&T's fleet alone.9 Moreover, states and local governments around the country are committed to expanded NGV roll outs. For instance, the governors of Colorado, Oklahoma, Pennsylvania, and Wyoming recently signed a memorandum of understanding to convert state fleets to CNG.10 [EPA-HQ-OAR-2010-0799-9464-A1, p. 4]

Of particular relevance to this docket, which targets incentives for the 2017-2025 time period, is the prospective build-out of a national NGV infrastructure and the availability of low cost home refueling appliances for NGVs. Last year, for example, several companies announced new financing commitments totaling $450 million to establish a coast-to-coast highway refueling network that, by 2014, could be capable of supporting tens of thousands of LNG-fueled trucks and CNG-fueled vehicles.11 By 2017, new 'brand name' home refueling appliances are expected to come to market, providing an affordable garage-based CNG option for over 65 million homes already connected to natural gas pipelines.12 [EPA-HQ-OAR-2010-0799-9464-A1, p. 4]

Beyond that, NGVs do not require the risky 'technological leaps' remaining for EVs and various alternative fuel technologies. In fact, most existing vehicles can be modified to utilize natural gas, as use of this fuel involves similar internal combustion components. In addition, the technological advancements (and associated fuel efficiency gains) that EPA and NHTSA predict for petroleum and diesel fueled engines are likely also to benefit NGVs.13 [EPA-HQ-OAR-2010-0799-9464-A1, pp. 4-5]

NGVs offer significant energy security benefits. As the President has noted, natural gas is an abundant domestic energy resource. The United States currently produces almost all of the natural gas that it uses and may actually be a net exporter of natural gas by 2021.15 Over 65 million homes are already connected to the local natural gas distribution network and expanding the delivery infrastructure may be more economical than developing similar infrastructure for electricity. For instance, a joint study by the Bonneville Power Administration and the Northwest Gas Association found that 'natural gas pipelines average between 50 and 60 percent of the cost of electric power transmission per unit of energy (or capacity) delivered."16 Additionally, adding new interstate natural gas pipeline capacity averages just three years from announcement date to commercial start of operations.17 [EPA-HQ-OAR-2010-0799-9464-A1, p. 5]

Finally, NGVs offer substantial GHG emission reduction benefits over conventional vehicles (those that use gasoline and diesel). Again, see Appendix 1. The natural gas-powered Honda Civic has regularly been recognized as among the 'greenest cars' on the road.18 While NGVs emit small amounts of methane, these emissions are more than offset by substantially reduced CO_2 emissions versus other vehicles.19 And in the future, larger amounts of bio-methane (a renewable fuel with a very low GHG footprint) may become available, further enhancing the emission benefits of NGVs.20 [Appendix 1 can be found on pp. 16-20 of Docket number EPA-HQ-OAR-2010-0799-9464-A1] [EPA-HQ-OAR-2010-0799-9464-A1, p. 5]

B. The Administration should not pick technology 'winners' and 'losers'.

In a market economy, it is an axiom of regulatory design that the government should avoid trying to favor competing technologies (or companies) by picking winners. Such decisions are best left to the private sector.21 This is especially true when the technology that may be favored faces large uncertainties in research or development for key components, materials supply risks in scaling-up production, billion dollar infrastructure hurdles and unproven consumer take up. [EPA-HQ-OAR-2010-0799-9464-A1, p. 6]

Qualified alternative fuel vehicles should all be given similar incentives so that they can compete on a level playing field in delivering the public benefits the Proposed Rule seeks. EVs may well have a very bright future. However, it is also possible that EVs may never be a widely-deployed technology. Unlike NGVs, EVs require technology advances in batteries and other components and have yet to be produced and deployed at scale.22 By comparison, NGVs utilize existing engine technology but merely burn a different fuel. Similarly, auto mechanics accustomed to working on typical internal combustion engines face a learning curve when asked to repair electric engines, which use a substantially different motor technology. [EPA-HQ-OAR-2010-0799-9464-A1, p. 6]

In short, the Administration should not create inefficient regulatory structures that pick technology winners and losers. That would be unlawfully arbitrary and capricious.23 Rather the Proposed Rule should be revised to establish a level playing field for alternative fuel vehicles. That is by far the most cost-effective and non-discriminatory way to achieve the rule's desired environmental and national security goals. [EPA-HQ-OAR-2010-0799-9464-A1, p. 6]

III. Regulatory structure of the Proposed Rule [EPA-HQ-OAR-2010-0799-9464-A1, p. 6]

The Proposed Rule consists of parallel standards issued by EPA and the NHTSA, which seek to accomplish similar goals through different regulatory mechanisms. In particular, EPA would impose a limit on vehicle GHG emissions pursuant to the Clean Air Act. More specifically, EPA's proposed standards require, on an average industry fleet-wide basis, an emissions standard of 163 grams/mile of CO_2e, which equates to 54.5 mpg, by 2025. Pursuant to CAA § 202, EPA has broad discretion to set emissions levels that are 'technology-based' and can be 'technology forcing.' Thus, EPA can use its standards to incentivize the deployment of advanced technologies such as EVs and NGVs. EPA proposes to include specific limits on three GHGs (CO_2, CH_4, N_2O), which can be met individually or through a combined CO_2-equivalent standard. [EPA-HQ-OAR-2010-0799-9464-A1, p. 7]

The NHTSA would increase the stringency of traditional mile-per-gallon (mpg) Corporate Average Fuel Economy Standards (CAFE). NHTSA proposes to tighten these CAFE standards pursuant to the Energy Independence and Security Act of 2007 (EISA), which amended the Energy Policy and Conservation Act of 1975 (EPCA). NHTSA considers four statutory factors in setting CAFE standards: technological feasibility, economic practicability, the effect of other Government standards on fuel economy, and the nation's need to conserve energy. NHTSA's proposal would require, on an average fleet wide basis, 49.6 mpg by 2025.24 [EPA-HQ-OAR-2010-0799-9464-A1, p. 7]

Because EPA and NHTSA both 'address the closely intertwined challenges of energy security and climate change,' they closely coordinated their GHG and CAFE standards development. Accordingly, both these EPA GHG and NHTSA CAFE standards are issued pursuant to this joint Proposed Rule, similar to the joint proposed standards that these agencies previously issued for light-duty vehicles for model years 2012-2016. [EPA-HQ-OAR-2010-0799-9464-A1, p. 7]

A. NHTSA alternative vehicle incentives. [EPA-HQ-OAR-2010-0799-9464-A1, p. 7]

Regarding EVs, NHTSA currently uses a statutorily-mandated petroleum equivalence factor (PEF) to convert the use of electricity into an equivalent 'miles per gallon.” The PEF for electricity includes an adjustment - that is, a discount - so that the mileage for EVs is calculated based on only 15% of the actual energy consumed. That adjustment provides a large benefit to EVs in calculating the average mileage for a manufacturer's fleet. Because Congress established this PEF incentive, NHTSA believes that it may not create additional incentives for EVs. EPA does not feel so bound, however, and proposes to create additional incentives for EVs in the Proposed Rule (as further described below). [EPA-HQ-OAR-2010-0799-9464-A1, pp. 7-8]

Under the current CAFE standards set by NHTSA, NGVs also receive similar benefits because the miles per CNG gallon equivalent are discounted by applying a 0.15 'divisor.' This incentive was created under the EISA, and the incentive is not scheduled for expiration. Under this incentive scheme, a 15 mpg dedicated alternative fuel vehicle is multiplied by 100/15 so that it would be rated as 100 mpg. The 'divisor' consequently has an impact equivalent to the PEF mentioned above for EVs. [EPA-HQ-OAR-2010-0799-9464-A1, p. 8]

B. EPA alternative vehicle incentives.

We come now to the nub of the discrimination and market inefficiencies that these comments are designed to rectify: Unlike the NHTSA rules, the EPA's new GHG standards contain additional EV-only incentives. These supplemental incentives arbitrarily and capriciously favor EVs over NGVS.31 For instance, EPA would continue the practice of considering EVs to be zero-emitting (up to certain production caps), even though EPA recognizes that generating electricity upstream creates substantial GHG emissions (particularly due to the emissions from coal-fired power plants). [EPA-HQ-OAR-2010-0799-9464-A1, p. 8]

EPA's proposal also includes a new incentive multiplier for EVs. Through this multiplier, EPA would allow a vehicle manufacturer to reduce its average fleet emissions by initially counting the lower emissions of each EV produced as two vehicles (i.e., using a 2 times multiplier). In addition, in the Model Year 2012-2016 rule, EPA utilized the same 0.15 'divisor' available in the CAFE rules (discussed above) in calculating GHG emissions compliance for NGVs. But, under the Proposed Rule, this incentive would expire. As a result, EPA's new rules would abolish the benefits NGVs gain under the NHTSA standards from the 0.15 'divisor' incentive. [EPA-HQ-OAR-2010-0799-9464-A1, p. 8]

C. Dual-fuel vehicle incentives. [EPA-HQ-OAR-2010-0799-9464-A1, p. 8]

The Proposed Rule also contains additional provisions that specifically address dual-fuel vehicles, including hybrid-electric vehicles and those that run on both CNG and gasoline. The Proposed Rule would change the assumption in both CAFE and GHG emissions regulations that alternative fuels are used 50% of the time in dual-fueled vehicles. Instead, the agencies would sensibly replace this 50/50 assumed fuel split with a 'utility factor'-Le., an approach that takes into account the actual percentage of alternative fuel use by the average driver. Thus, the Proposed Rule recognizes that 'CNG fuel is considerably cheaper than gasoline on a per mile basis,' and that CNG is likely to be used in a dual-fueled vehicle significantly more than 50% of the time. [EPA-HQ-OAR-2010-0799-9464-A1, pp. 8-9]

Dual-fuel vehicles also face discrimination related to the proposed use of the 0.15 'divisor.' Congress eliminated the 0.15 divisor incentive for non-electric, dual-fuel vehicles after 2019. The Proposed CAFE standards would continue the incentives for those dual-fueled vehicles after 2019. Again, however, EPA and NHTSA send a mixed message regarding CNG vehicles. Under EPA's proposal, dual-fuel CNG vehicles would see the 0.15 'divisor' eliminated from the alternative-fuel portion of a vehicle's emissions. By not utilizing the same incentive under its emissions standards, EPA limits the usefulness of NHTSA's incentives. [EPA-HQ-OAR-2010-0799-9464-A1, p. 9]

Finally, the Proposed Rule includes a significant focus on energy security concerns. We discuss these concerns-and how they might be better translated with a more effective set of vehicle incentives-at greater length below. [EPA-HQ-OAR-2010-0799-9464-A1, p. 9]

IV. Suggested Revisions to the Proposed Rule to Promote Technology-Neutral Benefits

A. A technology-neutral pool of alternative fuel incentives should be created. Vehicles in this pool, including NGVs, should qualify for the same incentives that are now only available to EVs, in particular the incentive 'multiplier.'

Rather than provide incentives to specific vehicle types, EPA should strive to be technology neutral in its efforts to reduce GHG emissions. In particular, the Proposed Rule offers two main incentives that currently favor EVs: the ability of manufacturers to count EV emissions at 0 grams/mile in calculating fleet averages; and an 'incentive multiplier' which begins by double-counting EVs in the overall fleet. This current incentive structure should be revised so that it is technology-neutral, and reflects life-cycle impacts, allowing NGVs-which provide comparable emission reductions and energy security benefits to EVs-to qualify for the same incentive available to EVs. [EPA-HQ-OAR-2010-0799-9464-A1, p. 9]

1. The incentive 'multiplier' should apply to NGVs and EVs. [EPA-HQ-OAR-2010-0799-9464-A1, p. 9]

The Proposed Rule provides a new incentive 'multiplier,' but as drafted would only allow this incentive for EVs. More specifically, this 'multiplier' allows manufacturers to multiply, by a determined factor, the number of EVs when calculating its fleet emissions profile. EVs would start with a multiplier value of 2.0 in Model Year 2017, phasing down to a value of 1.5 in 2021. [EPA-HQ-OAR-2010-0799-9464-A1, pp. 9-10]

By providing this incentive to EVs, while failing to provide a similar incentive to NGVs, the EPA has inappropriately picked EVs as 'the future' clean-car technology, thereby decreasing competition and incurring unnecessary program risks. This is unlawfully arbitrary and capricious. The GHG emission benefits on a life-cycle (well-to-wheel) basis are similar for EVs and NGVs. See Appendix 1. The EPA's current approach also harms consumers and cuts against the goals of the Proposed Rule because, as noted earlier, an NGV buyer likely can reduce her GHG vehicle emissions at a lower cost per unit than an EV buyer. [Appendix 1 can be found on pp. 16-20 of Docket number EPA-HQ-OAR-2010-0799-9464-A1] [EPA-HQ-OAR-2010-0799-9464-A1, p. 10]

The GHG emissions of NGVs are approximately 20-30% lower than for vehicles using gasoline. Furthermore, current technology can capture and utilize natural gas from renewable sources (e.g., landfills, farm animals). Natural gas from these sources (i.e., biomethane) has a carbon intensity approximately 85% less than gasoline.37 [EPA-HQ-OAR-2010-0799-9464-A1, p. 10]

All 'qualified' alternative fuel vehicles with a similar potential to reduce GHG emissions (on a well-to-wheel basis) should be eligible for a multiplier that encourages the production of these vehicles until annual vehicle sales reach 10% of total sales for all fleets combined.38 On this basis, the incentive would apply to approximately 1.5 million vehicles in 2017. The incentive could then be phased down by 2% annually so that it applies to a smaller number of qualified vehicles each year but affords a sufficient lead time for manufacturers to plan and begin deployment of these qualified vehicles. [EPA-HQ-OAR-2010-0799-9464-A1, p. 10]

Significantly, two other major federal programs for reducing the nation's GHG emissions treat the potential benefits of using NGVs and EVs in a similar way. The first provides for federal procurement for all qualified alternative fuel vehicles.39 The second, under Executive Order 13514, requires each federal agency to measure and report reduction targets for direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions.40 Because the tailpipe emissions of the agency's vehicles are counted in Scope 1 and emissions from electricity used by the agency (including recharging EVs) are counted in Scope 2, both NGVs and EVs have emissions reflected in the relevant accounts. In addition, both types of alternative fuel vehicles contribute, on a technology-neutral basis, to achieving the two-percent annual reduction in petroleum consumption required in Section 2(a)(iii) of this Executive Order, and both types of vehicles are covered by Section 12's guidance to develop strategies on alternative fuel vehicles.41 [EPA-HQ-OAR-2010-0799-9464-A1, pp. 10-11]

Indeed, EPA acknowledges that the upstream GHG emissions of EVs are a significant negative factor and may be worse than gasoline vehicles. EPA states that EVs in the 2017-2025 period 'will decrease the overall GHG emissions reductions associated with the program as the upstream emissions associated with the generation and distribution of electricity are higher than the upstream emissions associated with production and distribution of gasoline.” [EPA-HQ-OAR-2010-0799-9464-A1, pp. 11-12]

On the other hand, the superior emissions benefits of NGVs over gasoline vehicles are thoroughly documented. 'The conclusion of recent studies such as those conducted by CARB and others is that, when used as transportation fuel, natural gas can reduce greenhouse gas emissions by 20 - 29 percent compared with diesel and gasoline fueled vehicles, respectively.”46 When compared to EVs, NGVs provide comparable emissions benefits (and NGVs can even provide superior emission reduction benefits to EVs depending on the extent to which coal-fired power is used to generate electricity for EVs). In addition, while EPA is counting on technological advancements to improve EVs, technology for NGVs will also advance if given the same opportunities. [EPA-HQ-OAR-2010-0799-9464-A1, p. 12]

The most effective and lawful incentive structure to promote vehicle emission reductions is a 'multiplier' incentive for all alternative fuel vehicles. Such a program would more strongly encourage manufacturers to develop cleaner vehicles through competition between EV and NGV technologies, and would allow the market to decide the extent of each technology's success. [EPA-HQ-OAR-2010-0799-9464-A1, p. 12]

3. The 0.15 divisor should continue for NGVs.

As noted above in the regulatory overview, in EPA's MY 2012-2016 GHG rule for light-duty vehicles, EPA utilized the same 0.15 'divisor' available in the CAFE rules in calculating GHG emissions compliance for NGVs. However, EPA has currently scheduled this incentive to expire in model year 2016, and the Proposed Rule does not renew this incentive. By not recognizing the 0.15 'divisor' incentive under its GHG regulations, EPA appears to be undercutting a statutorily-mandated incentive (for the CAFE rules) through its proposed GHG rules. By proposing GHG rules that work against the CAFE regulatory scheme, EPA is acting in a counterproductive way and hindering the development of cleaner technologies. [EPA-HQ-OAR-2010-0799-9464-A1, p. 12]

For the joint NHTSA and EPA rulemaking process to be effective, the agencies must work together so that the incentives provided by one agency are not limited by the regulations proposed by the other.47 Accordingly the 0.15 divisor for NGVs that exists under the CAFE rules should also be continued under EPA's GHG rules for light-duty vehicles. [EPA-HQ-OAR-2010-0799-9464-A1, p. 12]

B. Because of their potential for rapid scale-up, EPA should incentivize the deployment of CNG dual-fuel vehicles to the maximum extent possible. [EPA-HQ-OAR-2010-0799-9464-A1, p. 12]

Many CNG vehicles worldwide are equipped to run as dual-fuel vehicles. These vehicles can facilitate consumer acceptance of alternative fuel vehicles through the use of a small gasoline tank, thus reducing the 'range anxiety' that some consumers may have when choosing a vehicle that, as yet, has a limited fueling infrastructure.48 Dual-fuel CNG vehicles have the potential to be a 'game-changer' through rapid deployment. They also have a superior combination of reliability and the ability to use a domestic, clean-burning fuel, while reducing concerns about 'range anxiety.' Because CNG is 'considerably cheaper than gasoline on a per mile basis,' for dual-fueled vehicles the Proposed Rule includes a 'utility factor' approach that would 'result in a compliance assumption of about 95% operation on CNG and about 5 percent operation on gasoline' for CNG/gasoline dual-fueled vehicles.49 [EPA-HQ-OAR-2010-0799-9464-A1, p. 13]

The deployment of dual-fuel CNG vehicles should be encouraged by the agencies through the maximum use of incentives. Specifically, EPA should use a standard 'utility factor' that assumes these vehicles will run on CNG 95% of the time, as this reflects EPA's 'real-world' projection of these vehicles. This 95% figure should be a default value and not require a case-by-case review that might otherwise be required to determine the utility factor. [EPA-HQ-OAR-2010-0799-9464-A1, p. 13]

Furthermore, the incentive multiplier outlined above should apply to dual-fuel CNG vehicles as well. A multiplier is already allowed for PHEVs, which are operationally similar to CNG dual-fuel vehicles (in the sense that two sources of energy may operate the vehicle, in the case of PHEVs this being either electricity or gasoline). If PHEV's qualify for a multiplier, then so too should CNG dual-fuel vehicles. Finally, the 0.15 divisor should be available under both the CAFE standards and EPA's GHG rules for the portion of the vehicle's operation on natural gas. [EPA-HQ-OAR-2010-0799-9464-A1, p. 13]

C. The Proposed Rule should provide incentives for manufacturers producing NGVs and other vehicles that use fuels having superior energy security benefits.

'Energy security' is a central focus of the Proposed Rule. However, The Proposed Rule does not provide explicit incentives for manufacturing vehicles on the basis of energy security benefits. Nothing in either the EPA or NHTSA calculations explicitly considers energy security. By providing incentives for vehicles that enhance our energy independence, the agencies could ensure that manufacturers consider this factor. These incentives would also spur development and advance technology in the area of alternative fuel vehicles. [EPA-HQ-OAR-2010-0799-9464-A1, p. 13]

Because the comparative energy security benefits of different fuels can be readily ascertained an objective basis can be established for providing incentives. For example, a 'baseline' against which to assess energy security benefits could be tied to the current ratio of imported-to-domestic oil (which is used to make gasoline and diesel, the dominant fuels in light-duty vehicles). Thus, if the current ratio of imported-to-domestic gasoline/diesel used in fleets covered by the proposed rules is approximately 50-50, then covered vehicles that use a fuel with a higher percentage that is sourced domestically would be assigned a factor between 1 and 2. 51 A vehicle's multiplier could then be increased by this factor for the purpose of doing a fleet-wide compliance calculation. [EPA-HQ-OAR-2010-0799-9464-A1, pp. 13-14]

Alternatively, each manufacturer could have a fleet wide 'energy security' rating against which to measure the benefits/incentives it should receive. A manufacturer's ability to take advantage of its 'energy security' incentives could be dependent on its fleetwide GHG emission average: should a manufacturer's fleet meet the requirements for an 'energy security' benefit but not meet the applicable GHG standards, that manufacturer would be unable to utilize that benefit.52 [EPA-HQ-OAR-2010-0799-9464-A1, p. 14]

Various forms of 'revenue recycling' also could reward manufacturers who produce vehicles that enhance energy security. For instance, the revenue from fines collected under various motor vehicle regulations could be dedicated to enhance the use of fuels with energy security benefits. Since the implementation of CAFE standards, a total of nearly $795 million has been collected. In Model Year 2009, the last year data is available, the collected fines totaled approximately $9 million.53 In 2007, the total of collected fines was more than $37 million.54 [EPA-HQ-OAR-2010-0799-9464-A1, p. 14]

As noted above, NGVs offer significant energy security benefits. Utilizing natural gas as a fuel source is economical and wholly secure, as natural gas is an abundant domestic energy resource.55 Although the electricity used to repower EVs is domestic, the batteries on which EVs rely may be dependent on lithium and other scarce metals which must be imported from a limited range of nations.56 [EPA-HQ-OAR-2010-0799-9464-A1, pp. 14-15]

While EPA and NHTSA may take a variety of approaches in recognizing energy security benefits, what does seem clear is that these energy security benefits should be explicitly rewarded in order to further the stated energy security goals of the Proposed Rule. [EPA-HQ-OAR-2010-0799-9464-A1, p. 15]

V. Conclusion

Natural gas is an abundant domestic fuel that produces lower GHG emissions than gasoline and diesel on a lifecycle basis, and its use in vehicles involves widely-used, reliable engine technology. Encouraging the increased use of natural gas in vehicles will help to achieve EPA's goal of reducing GHG emissions from the nation's vehicle fleet. NGVs and dual-fuel CNG vehicles can also substantially improve our nation's energy security. Worldwide, millions of vehicles run on natural gas and the technology for NGVs is already available. Yet, despite the considerable benefits of NGVs, the Proposed Rule offers multiple incentives to EVs while overlooking the often superior benefits of NGVs. [EPA-HQ-OAR-2010-0799-9464-A1, p. 15]

The Proposed Rule must be revised so that its incentive structure for alternative fuel vehicles is technologically neutral and not anti-competitive. Failure of EPA and NHTSA to do so would be arbitrary and capricious. A technologically-neutral incentive scheme will unlock the full potential of our nation to utilize alternative fuels to meet both GHG reduction and energy security goals. [EPA-HQ-OAR-2010-0799-9464-A1, p. 15]

---

5 Based on the EPA's own data, from the consumer's standpoint, it is likely to be far cheaper-as measured in vehicle dollars spent to reduce a given amount of greenhouse gas per mile-for a driver to acquire a new NGV rather than an EV, given the substantially lower purchase cost of a CNG vehicle and the comparable full fuel cycle GHG reductions in emissions versus a gasoline powered vehicle. Small-sized EV sedans are expected to cost over $27,000 more in 2016; the additional cost for a CNG vehicle is likely to be under $2,500. See Draft Joint Technical Support Document, Proposed Rulemaking: Mode/ Year 2012-2016 Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards, p. 3-91, available at www.epa.gov/otag/c1imate/regulations/420d09901.pdf.

6 International Natural Gas Vehicle Association, http://www.iangv.org/tools-resources/statistics.html. Companies that currently offer NGVs worldwide include Fiat, Chrysler, GM, Ford, Honda, and Mercedes.

7 A report from Pike Research notes that the 2011 sales of plug-in EVs and battery EVs totaled 'just under 114,000' worldwide. See http://www.pikeresearch.com/newsroom/cum ulative-plug-in-electric-vehicle-sales-to-reach-5-2million- worldwide-by-2017. By way of comparison, worldwide sales of NGVs in 2009 (the most recent worldwide data) were over 1.3 million vehicles. See http://www.iangv.org/tools-resources/statistics.html. See a/so, 76 Fed. Reg. 75,011 (noting that sales of the Nissan Leaf have been only approximately 8,000, and sales of the Tesla Roadster have been only approximately 1,500).

8 Henry Lee & Grant Lovellette, 'Will Electric Cars Transform the U.S. Vehicle Market? An Analysis of the Key Determinants,' Discussion Paper 2011-08, Belfer Center for Science and International Affairs, July 2011, available at http://belfercenter.ksg.harvard.edu/files/Lee Lovellette Electric Vehicles DP 2011 web. pdf.

9 See Energy Information Administration, Alternatives to Traditional Transportation Fuels 2008 (2010), http://www.eia.gov/cneaF/alternative/page/atftables/afv_atF2008.pdF; Department of Energy, Alternative Fuels and Advanced Fuels Data Center, press release, http://www.afdc.energy.gov/afdc/progs/fleet exp cat.php/LDV.

10 See e.g., http://www.cleanvehiclesolutions.com/blog/2011/12/29/governors-sign-memorandum-understandingconvert-state-fleets-naturaI-gas/.

11 See e.g., http://www.cleanenergyfuels.com/2011/7-11-11.html.

12 These next-generation appliances will build upon existing home refueling stations manufactured by companies such as BRC Fuel Maker (see http://www.brcfuelmaker.it/eng/casa/chi siamo.asp) and Gas Fill Limited (see http://www.gasfill.com).

13 See IEA-ETSAP Technology Brief, April 2010, available at http://www.iea-etsap.org/web/ETechDS/ PDF/T03 LPG-CH4 eng-GS-gct-AD.pdf

15 EIA Annual Energy Outlook 2012, available at http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2012).pdf.

16 Bonneville Power Administration & Northwest Gas Association, Comparing Pipes and Wires, March 2004. http://www.chpcenternw.org/NwChpDocs/Transmission and N Gas Comparing Pipes and Wires 032304.pdf. Furthermore, EVs are expected to 'have a significant impact on electrical grid strain.' See e.g., Nicholas DeForest, et aI., 'Impact of Widespread Electric Vehicle Adoption on the Electrical Utility Business - Threats and Opportunities,' Technical Brief, University of California, Berkeley Center for Entrepreneurship & Technology.

17 Implications of Greater Reliance on Natural Gas for Electricity Generation, American Public Power Ass'n, https://appanet.cms-plus.com/files/PDFs/lmplicationsOfGreaterRelianceOnNGforElectricityGeneration.pdf.

18 See the annual ratings issued by the American Council for an Energy Efficient Economy (ACEEE) at http://www.greenercars.org/highlights greenest.htm and http://www.honda.com/newsandviews/article.aspx?id=5904-enI noting that the CNG-powered Honda Civic GX was rated the 'greenest car in America' for eight years in a row (from 2003 to 2011).

19 The California Air Resources Board (CARB) has extensively analyzed this issue and found that CNG produces approximately 68 grams of CO_2 equivalent emissions per mega joule (MJ) burned. By comparison, gasoline and diesel produce approximately 94-95 grams of CO_2e/MJ.

These comparisons are based on well-documented, well-to-wheel analyses. Thus, natural gas can reduce GHG emissions by 28-29% compared with diesel and gasoline-fueled vehicles. See CARB Look Up Table, http://www.arb.ca.gov/fuels/lcfs/121409Icfs lutables.pdf

20 As detailed in Appendix 1, an NGV using even a 15% bio-methane blend would significantly reduce total GHG emissions. DOE's National Renewable Energy Lab has estimated future production of bio-methane will reach up to 16 billion gasoline gallons equivalent (GGEs). 74 Fed. Reg. 24,982. Bio-methane achieves approximately an 85 percent reduction in GHGs as compared to gasoline.

21 The federal government's track record in selecting clean energy winners has been questionable, at best. Over the last year, in addition to the well-publicized bankruptcy of the solar manufacturer Solyndra (which received a DOE loan guarantee of more than $500 million), a manufacturer of lithium-ion batteries for EVs, EnerDel, also filed for bankruptcy after receiving a $118 million grant from DOE. In 1971, significant federal funding was authorized for the Clinch River Breeder Reactor Project, which was considered to be 'revolutionary' at the time. Twelve years and $8 billion later, Congress pulled funding for the project, which was never finished. See e.g., http://www.nader.org/template.php?/archives/926-That-Clinches-lt-The-Breeder-Reactor-is-Dead.html.

22 See Lee & Lovellette, Discussion Paper, note 8, supra (noting that 'Batteries may become cheaper and lighter, and charging equipment can become more versatile; but these improvements are still developing').

23 See North Carolina v. EPA, 531 F.3d 896 (D.C. Cir. 2008) (holding that EPA's NO_x emissions trading program unduly favored coal-fired generation over natural-gas generation).

24 NHTSA is expressly prohibited from considering the availability of statutorily-established credits (such as for alternative-fueled vehicles) in determining its standards. Thus, NHTSA may not raise CAFE standards because manufacturers have enough of those credits to meet higher standards. By comparison, EPA's CAA authority does not have such a restriction, which allows EPA to set higher standards. 76 Fed. Reg. 75,341.

31 The Proposed Rule separately identifies electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs). However, the regulatory benefits for both of these electric vehicle types are generally the same under the Proposed Rule. Therefore, 'EVs' in these comments should be understood to include both electric vehicles as well is plug-in hybrid electric vehicles, unless the context requires otherwise. Fuel cell vehicles also often share in comparable benefits, though because of the limited market deployment of these vehicles, they are not separately discussed herein.

37 Again examining CARB's look up table provides an approximate value of 94-95 gCO_2e/MJ for gasoline and diesel, while renewable natural gas has an approximate value of 11-13 gCO_2e/MJ. See CARB Look Up Table, note 19, supra.

38 'Qualified alternative fuel vehicles' should include only those vehicles that use an alternative fuel a minimum of 50% of the time (i.e., those vehicles that have a 'utility factor' equal to or greater than 50%). ACSF believes this qualification criteria is necessary to encourage the development of technologies that are truly 'alternative' with the potential to be 'game changing.' Thus, if forecast use of an alternative fuel is less than 50% (such as is the case with ethanol flex-fuel vehicles), then the vehicle class would not qualify for this incentive.

39 See EPA, 'Guidance for Implementing Section 141 of the Energy Independence and Security Act of 2007: Federal Vehicle Fleets and Low Greenhouse Gas-Emitting Vehicles' at 5 (Feb. 22, 2010).

40 Executive Order 13514, 'Federal Leadership in Environmental, Energy, and Economic Performance' Section 2(a) (Oct. 5, 2009), available at http:(/www.whitehouse.gov/assets/documents/2009fedleader eo rel,pdf.

41 See Federal Energy Management Program, 'Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance; Guidance for Federal Agencies on E.O. 13514 Section 12, Federal Fleet Management,' at 2 (Apr. 2010), available at http://www.gsa.gov/graphics/fas/ExecutiveOrder13514.pdf.

46 NGVAmerica, 'NGVs and the Environment,' available at http://www.ngvc.org/aboutngv/ngvenviron.html. Blending renewable sources of natural gas with traditional natural gas can further lower NGV GHG emissions.

47 Notably, the 'PEF' for EVs, which provides an equivalent benefit to the 0.15 divisor for EVs under the CAFE rules, continues to be in effect and is not impacted by the Proposed Rule.

51 With 1 being the baseline and 2 being equivalent to fuel that is 100% domestically sourced.

52 Another possible means of rewarding energy security is to make energy security benefits one of the 'gating' criteria for the existing vehicle multiplier, discussed above in section IVA For instance, to qualify for this multiplier EPA would need to determine that a certain minimum percentage of a vehicle's fuel is domestically sourced (say 75%), and that the vehicle drive-train technology does not require foreign-sourced materials that constitute more than a certain percentage of the drive-train's costs. 53 See Summary of CAFE Fines Collected, available at www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/CAFE fines collected summary.pdf.

54 As an example of statutory authority for revenue recycling, under 49 U.S.C. § 32912(e)(2), the Secretary of Transportation must use 50% of the fines collected 'to carry out a program to make grants to manufacturers for retooling, reequipping, or expanding existing manufacturing facilities in the United States to produce advanced technology vehicles and components.' Using the above 'energy security' factor, the agency could provide funds to manufacturers based upon the highest fleet wide 'energy security' factor to encourage development of vehicles that provide for a more secure energy future.

55 See EIA, 2012 Energy Outlook Early Release, Table A13, which finds that the 2012 supply of natural gas is in excess of 25 trillion cubic feet. Available at http://www.eia.gov/oiaf/aeo/tablebrowser/#release=EARLY2012 &subject:O-EARLY2012&tabIe:13EARLY2012& region=0-0&cases=fuI12011-d020911a,early2012-d121011b. See also Mass. Inst. of Tech., The Future of Natural Gas (noting that in the U.S., natural gas resources continue to grow, and the development of low-cost and abundant unconventional natural gas resources, particularly shale gas, has a material impact on future availability and price.), available at, www.cleanskies.org.

56 See http://www.minerals.usgs.gov/mineraI5/pub5/commodity/lithium/mcs-2011-lithi.pdf.

Organization: American Honda Motor Co., Inc.

Additionally, EPA requested comments about the inclusion of compressed natural gas vehicles (NGVs) in these incentives. NGVs have similar environmental and energy security benefits compared to EVs and PHEVs, and their marketing challenges (infrastructure and consumer acceptance) are similar, as well. Honda supports the addition of dedicated NGVs to the group of dedicated vehicle multipliers (EV and FCVs) and bi-fuel NGVs to the bi-fuel vehicle multipliers (PHEVs). A differential in the multiplier for dedicated and bifuel natural gas vehicles is fully justified because there is no guarantee that the latter will operate on natural gas all of the time. [EPA-HQ-OAR-2010-0799-9489-A1, p. 3]

Honda recommends revising Table III-15 as follows: [Table III-15 can be found on p. 3 of Docket number EPA-HQ-OAR-2010-0799-9489-A1] [EPA-HQ-OAR-2010-0799-9489-A1, p. 3]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 118-119.]

However, EPA intends to use the SAE utility factor in calculating the contribution of each fuel in climate change in the future bi-fuel vehicle, which Honda believes will virtually eliminate any regulatory differentiation between a dedicated and the bi-fuel natural gas vehicle to detrimental effect. Therefore, Honda suggests that EPA instead add dedicated natural gas vehicles to the EV and fuel cell electric vehicle group of technologies and add bi-fuel natural gas vehicles to the PHEV group of technologies with respect to the multiplier.

Organization: American Petroleum Institute (API)

Comments on the Proposed Approach to Measure Compliance with Fuel Economy and GHG Standards for Dual-Fuel CNG vehicles

EPA and NHTSA note that the statutory incentive for dual-fueled vehicles in 49 U.S.C 32906 and the measurement methodology specified in 49 U.S.C 32905 (b) and (d) expire in MY 2019 and request comment on proposed options going forward. The agencies are proposing to directly extend the PHEV utility factor methodology to dual-fuel CNG vehicles, using the same assumptions about daily refueling. Under the utility factor approach, the vehicle range on the alternative fuel would be used to estimate the fraction of average daily travel that the range represents based on SAE Standard J2841. For example, a plug-in hybrid electric vehicle (PHEV) with an all-electric range of 40 miles would be assigned a utility factor of 0.617, while a dual-fuel natural gas vehicle (NGV) with a range on natural gas of 150 miles would be assigned a utility factor of 0.925. [EPA-HQ-OAR-2010-0799-9469-A1, p. 7]

We have several concerns with this proposed approach. First, it relies on the implicit assumption that the driving behavior of owners/operators of PHEVs is identical to that of owners/operators of dual-fuel CNG vehicles; an assumption which we do not believe is (or has been) demonstrably supported by any underlying data, yet should be. (A related question is whether the driving behavior and vehicle use characteristics of that element of the population sometimes termed “early technology adopters” is similar to, or different than, the “national average” database of travel characteristics from which the Utility Factors were created.)13 Second, although the use of the utility factor is an improvement over the simple 50/50 split used previously, this approach inherently assumes that the vehicle begins each day with a full state of charge (PHEVs) or a full natural gas tank (NGVs). It is unclear that this will occur in practice, and it may significantly overestimate the calculated benefits of the alternative fuel. Additionally, the vehicle range on the alternative fuel is established based on 2-cycle testing (i.e., the FTP and the highway fuel economy test) that is used to determine compliance with the CAFE and GHG standards. This clearly overestimates the range on the alternative fuel, and the proposed rule should be revised to reflect real-world vehicle range based on 5-cycle test results or other data that better represent real-world performance. This is not at all inconsistent with the use of 2-cycle tests for CAFE and GHG emissions compliance, as the real-world range would only be used to establish the appropriate utility factor, which, in turn, was based on real-world driving statistics. [EPA-HQ-OAR-2010-0799-9469-A1, pp. 6-7]

EPA and NHTSA Should Not Contravene the Will of Congress by Allowing an Unlimited Fleet Fuel Economy Credit for MY 2020 and Later Dual-Fueled Vehicles

EPA and NHTSA also are requesting comment on whether to continue to use the 0.15 divisor for CNG and ethanol, and the petroleum equivalency factor for electricity, both of which the statute requires to be used through MY 2019, for model years 2020 and later dual-fueled vehicles. The use of these factors in conjunction with the utility factor approach discussed above artificially and substantially inflates the fuel economy of dual-fueled vehicles and thus provides an incentive to the automakers to produce these for CAFE compliance purposes regardless of other consequences. In essence, the agencies are proposing that automakers may “…increase their calculated fleet fuel economy for dual-fueled vehicles by an unlimited amount using these flexibilities.”16 However, Section 32906 of the Energy Independence and Security Act of 2007 (EISA 2007) phased-out the maximum fuel economy credit attributable to dual-fuel vehicles (except electric vehicles) that could be taken by manufacturers of those vehicles such that the credit was reduced from 1.2 mpg in model year 2014 (and previous model years) to 0.2 mpg in model year 2019 to “0 miles per gallon for model years after 2019” (Section 32906(a)(7)). Clearly, the EPA and NHTSA proposed treatment of model year 2020 and later dual-fueled natural gas vehicles is overly generous and inconsistent with the intent and will of Congress. It should be set aside. [EPA-HQ-OAR-2010-0799-9469-A1, p. 7]

It is also useful to note that for the many years that this CAFE credit incentive has been in place, dual-fueled vehicles (particularly those using natural gas) have continued to remain a negligible fraction of the fleet. In other words, the presence of the incentive has not contributed to the influx of dual-fueled CNG vehicles. (In fact, there are no OEM dual-fuel CNG vehicles offered today; only a few after-market conversion models.) [EPA-HQ-OAR-2010-0799-9469-A1, p. 7]

---

13 Bradley, T.H and Quinn, C.W., Analysis of Plug-In Hybrid Electric Vehicle Utility Factors, Journal of Power Resources, 195 (2010) 5399-5408 [EPA-HQ-OAR-2010-0799-9469-A1, p. 6]

16 Note that E85 FFVs would need to demonstrate actual use of the alternative fuel to receive credit, via national average E85 and gasoline usage or manufacturer-specific data. [EPA-HQ-OAR-2010-0799-9469-A1, p. 7]

Organization: American Public Gas Association (APGA)

APGA also sincerely appreciates both agencies' efforts to make changes to the Greenhouse Gas/Corporate Average Fuel Economy Standards to further advance the development and deployment of alternative fueled vehicles (AFVs). However, APGA respectfully submits that both agencies consider changes to the NOPR (detailed below) to ensure that natural gas vehicles (NGVs) and infrastructure receive equal treatment to other AFV technologies. [EPA-HQ-OAR-2010-0799-9448-A1, p. 1]

Natural gas vehicles (NGVs) can play a critical role in reducing America's energy dependence on foreign oil, as well as reducing greenhouse gas emissions. The combination of a secure, domestic, affordable fuel source that can be used by existing technology makes NGVs the logical choice for replacing our transportation fleet.

In order to ensure that NGVs can make these critical contributions to U.S. energy and national security, APGA respectfully submits the following comments on: Current Law, the EPA/NHTSA Proposal for 2012-2015, and the Proposal for the 2016-2019 period. [EPA-HQ-OAR-2010-0799-9448-A1, p. 2]

2012-2015 Current Law: APGA believes that as structured under current law, dedicated and bi-fuel NGVs appear to receive significant NGV Fuel Economy (FE) and Greenhouse Gas Emissions (GHG) credits due to the .15 multiplier. However, because of the fact that E85 Flex Fuel Vehicles (FFVs) are eligible to receive these credits and because Original Equipment Manufacturers (OEMs) will likely not be required to have additional FE and GHG credits, they will be of little value to NGVs. [EPA-HQ-OAR-2010-0799-9448-A1, p. 2]

Additionally, APGA respectfully requests clarification on the following issues:

- Can GHG credits for dedicated and bi-fuel NGVs be carried forward?
- Can the bi-fuel FE credits be carried forward?

- Can the FE credits for dedicated vehicles be carried forward? [EPA-HQ-OAR-2010-0799-9448-A1, p. 2]

APGA respectfully requests that clarification be provided for each of these issues. [EPA-HQ-OAR-2010-0799-9448-A1, p. 2]

EPA/NHTSA Proposal 2012-2015:

Given the issues with current law, APGA respectfully requests that EPA and NHTSA to extend the incentives provided in 2012 – 2015 specifically for dedicated and bi-fuel NGVs until NGV sales hit a level demonstrating market acceptance or commercialization. APGA is open as to how to properly define this metric but suggests that perhaps a sales threshold of 250,000 dedicated NGVs per year is practicable. [EPA-HQ-OAR-2010-0799-9448-A1, p. 2]

Moreover, APGA also suggests that EPA and NHTSA establish a separate track for bi-fuel vehicles so that the credits for these vehicles are not overwhelmed by the FFV credits and subject to the caps of bi-fuel vehicles. APGA believes that the legal justification for this change is the same that they are offering for 2020 and beyond – i.e., the Utility Factor (UF) bases performance on real-world expectations not the seemingly arbitrary 50/50 allocation established in Energy Policy and Conservation Act (EPCA). [EPA-HQ-OAR-2010-0799-9448-A1, p. 2]

APGA also urges EPA to provide an incentive for OEMs like Ford and GM and others who are facilitating the development of the aftermarket industry by offering Natural Gas-ready engines and setting up Qualified Vehicle Manufacturer (QVM) programs. The aftermarket vehicles largely are not covered by GHG and FE rules so the OEMs should receive some credit for facilitating increased availability of aftermarket vehicles. [EPA-HQ-OAR-2010-0799-9448-A1, p. 2]

2016-2020 [EPA-HQ-OAR-2010-0799-9448-A1, p. 3]

APGA appreciates the changes the proposed rules make to current law. However, APGA does have two brief suggestions for improvement on two elements under EPA jurisdiction: the production multiplier and pickup truck rules. [EPA-HQ-OAR-2010-0799-9448-A1, p. 3]

EPA specifically solicited comments on whether it should provide a production multiplier for dedicated and bi-fuel NGVs for 2017 - 2021 – which would be a GHG credit. APGA strongly believes that this credit would be beneficial for NGVs if they are treated similarly under the rule as PHEVs. [EPA-HQ-OAR-2010-0799-9448-A1, p. 3]

Organization: Association of Global Automakers, Inc. (Global Automakers)

EPA invited comments on providing a multiplier incentive for dedicated and/or dual fuel compressed natural gas vehicles. Global Automakers supports such an approach, which would address the near term price and fueling infrastructure obstacles faced by these vehicles in a manner consistent with the approach taken for electric and fuel cell vehicles. Furthermore, Global Automakers supports the extension of multiplier incentives to other alternative fuels as well, such as liquid petroleum gas (LPG) or biodiesel. With regard to dual fueled vehicles in general, we urge the agencies to reconsider the treatment of these vehicles as part of the planned mid-term review of the standards, at which point the need for particular incentives would be clearer. Whatever approach is adopted, we urge that EPA and NHTSA agree on a single, harmonized set of incentives. [EPA-HQ-OAR-2010-0799-9466-A1, p. 7]

Organization: Boyden Gray & Associates PLLC

First, the joint proposal prioritizes CO_2 control at the expense of petroleum import reduction, which should be the paramount goal of these regulations. But the joint proposal fails to expressly acknowledge its preference; because of that lack of transparency, we fear that it will receive insufficient comment. [EPA-HQ-OAR-2010-0799-9506-A1, p. 1]

CO_2 VERSUS OIL IMPORT REDUCTION

In this joint rulemaking, both EPA and DOT go to considerable lengths to assert that although each agency is governed by different legislative authority, their proposals are for all relevant purposes similar in their requirements. Unfortunately this is not the case—the two agencies propose to impose fundamentally incompatible requirements. [EPA-HQ-OAR-2010-0799-9506-A1, p. 2]

Of course, similarity is not what one would expect from just a cursory familiarity with the underlying statutes—the Clean Air Act (CAA) and the Energy Independence and Security Act of 2007 (EISA)—and similarity is not in fact what results. The agencies acknowledge (fleetingly) the tradeoffs between climate control and oil import reduction, yet they fail to acknowledge the major contradictions that could easily develop under these joint proposed rules. [EPA-HQ-OAR-2010-0799-9506-A1, p. 2]

The easiest starting point for explanation is DOT's own description of the central intent of the authorizing 2007 energy legislation: "the overarching purpose of the statute is energy conservation and reducing petroleum usage." To that end, the statute provides for an alternative fuel "multiplier" that the 2007 Energy bill requires for model years to 2019 and which the agencies propose to continue well beyond. The multiplier—actually a 0.15 divisor—is a very powerful regulatory boost for domestically produced alternative fuels such as alcohols, natural gas or hydrogen. The mechanism works by dividing the miles per gallon (equivalent of gasoline) of the alternative fuel by 0.15, so that a car getting 15 miles per gallon on alternative fuel goes into the car company's fleet average as a 100-mpg vehicle. As the preamble to the proposed rules also explains, a typical compressed natural gas (CNG) vehicle that gets 25 miles per 100 cubic feet of gas goes into the average as a car getting 203 mpg. [EPA-HQ-OAR-2010-0799-9506-A1, p. 2]

These are big numbers with a potentially significant impact for lowering an automaker's fleetwide average fuel economy if the company sells more than a few alternatively fueled vehicles. Assume, for example, that a car company sells 30% of its vehicles to fleet operators (limousines, delivery vehicles, taxi cabs, etc.), and that the company decides to convert, by 2025, half of those cars (i.e., 15% of total sales) to natural gas.6 If 15% of the company's sales are

CNG-fueled, with a fuel economy of 203 mpg, the company could still achieve NHTSA's 2025 fuel economy requirement (49.6 mpg) so long as the remaining 85% of its sales were at least 43.77 mpg. Similarly, a car company could convert 15% of its total sales in 2025 to vehicles that run on E30—a blend of 30% ethanol and 70% gasoline that allows for some increased engine efficiency because of its high octane. Given growing awareness of the benefits of E30 as a sustainable and cleaner fuel choice, the administrator could grant a multiplier to E30 that functions in the same way as the current 0.15 multiplier for alternative fuels.8 A multiplier of 0.7 for E30, based on the 70% fuel content of E30, would allow the car company to meet NHTSA's 2025 requirement of 49.6 mpg with a fleet of cars that achieve only 47.4 mpg, so long as 15% of those vehicles were run on E30. These margins—6 mpg in the CNG example and 2.2 mpg in the E30 example—would provide car companies with flexibility to experiment with technological advances to satisfy consumer demand and reduce traditional pollution without fear of fines. That opportunity is precisely the type of incentive that the EISA, amending the Energy Policy and Conservation Act, was enacted to create: as NHTSA recognizes in its "portion" of the joint rulemaking proposal, EISA was enacted to promote fuel economy and displace foreign oil. It is irrelevant that companies may have made downsizing commitments in anticipation of continued high oil prices and may therefore never need the maximum leeway theoretically provided. The key is at the margins, and the need for car companies to steer clear of problems that cannot be anticipated, such as a changing consumer preferences and fluctuating oil prices. [EPA-HQ-OAR-2010-0799-9506-A1, pp. 2-3]

In practice, NHTSA's incentive structure is a mirage, because it is nullified in substance by EPA's greenhouse gas emissions regulations. Under the EPA's proposed rules, a car company could not fully utilize the 0.15 multiplier, as hypothesized above, to convert 15% of its sales to CNG, because the total emissions for all cars sold, including gasoline-fueled cars making up 85% of total sales, would far exceed EPA's maximum emissions limits. The company's total vehicle stock—15% CNG-fueled vehicles, with a statutory fuel economy of 203 mpg; and 85% gasoline-fueled vehicles, with a fuel economy of 43.77 mpg—would produce emissions averaging approximately 203 g/mi, 25% more than the EPA's proposed 2025 limit of 163 g/mi.10 Perhaps more to the point, today's CNG vehicles could not satisfy EPA's 2025 CO_2 requirements, despite the multiplier, even though CNG vehicles produce almost 30% less CO_2 emissions than gasoline vehicles do, because the EPA rules require a CO_2 reduction by 2025 larger than 30% (i.e., 163 g/mi verses 203 g/mi). Put another way, CNG vehicles alone would produce more CO_2 than a gasoline car that has been downsized and otherwise redesigned to meet a163 g/mi CO_2 rating.11 [EPA-HQ-OAR-2010-0799-9506-A1, p. 3]

In other words, the EPA's rules eliminate the flexibility that EISA, as implemented by NHTSA, is supposed to create for automakers. EPA's proposal caps car companies' ability to utilize NHTSA's 0.15 multiplier. EPA's proposal effectively repeals much of DOT's import-reduction efforts, and the 2007 statute on which DOT's efforts are based. [EPA-HQ-OAR-2010-0799-9506-A1, p. 4]

As noted above, the agencies cannot avoid this conflict by asserting that car companies are unlikely to want to utilize the 0.15 multiplier to an extent that would violate EPA's greenhouse gas limits. In fact, this scenario is much more likely than the agencies might admit, because the agencies own efforts to promote electric cars may be unrealistic. While the agencies presume that a significant segment of the market will move to hybrid and plug-in electric vehicles, actual electric car sales have fallen far short of the agencies' hopes; even going forward, electric vehicles' future is clouded by limited access to low priced rare metals essential to large scale battery production. Moreover, the future of solar and wind renewable energy is much less robust today than just a year ago, given the well publicized difficulties with solar investments and the very low price of natural gas. This could mean a much higher CO_2 profile for electric vehicles over the long haul (beyond the first 200,000 which are exempt from the life cycle analysis that applies to other alternative fuels). [EPA-HQ-OAR-2010-0799-9506-A1, p. 4]

Indeed, while market forces are making electric vehicles less attractive, market forces are making alternative-fueled vehicles more attractive. Natural gas vehicles will benefit from the low price of natural gas, which stems largely but not exclusively from the gas shale revolution. At the same time, biofuels will become more popular: ethanol produces less CO_2 than gasoline, on a life-cycle basis; but like natural gas, it still produces much more than a downsized gasoline car. It is not hard to envision a combination of natural gas and biofuel growth encouraged by the 2007 legislation that quickly challenges the CO_2 limits imposed by EPA. [EPA-HQ-OAR-2010-0799-9506-A1, p. 4]

Which regime takes precedence, EPA's or DOT's? The former is based on the Clean Air Act (CAA), the latter, on the 2007 EISA. The relevant CAA provisions were enacted as far back as 1970 and 1990, when climate change policy-making was in its infancy; there has been no relevant CAA legislation since 1990. If there is an irreconcilable conflict between the statutes, then the EISA will likely control the CAA, because the later enactment ordinarily displaces the earlier. [EPA-HQ-OAR-2010-0799-9506-A1, p. 4]

And in this case, the legislative history makes the EISA's displacement of the CAA even clearer. The Supreme Court ruled in Massachusetts v. EPA (2007) that CO_2 was a "pollutant" within the meaning of the CAA and thus subject to regulation upon a finding by EPA that CO_2 endangers the environment—a finding subsequently made by EPA that is now on appeal. In the Massachusetts v. EPA litigation, the EPA had argued that they could not regulate greenhouse gas emissions because doing so would be equivalent to regulating fuel economy, a subject committed to DOT's jurisdiction by the Energy Policy Conservation Act. The Supreme Court observed, without providing any details, that "there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency." That hypothetical co-existence might have been possible in 2006, but Congress's enactment of the EISA later that year ended any hope for co-existence. The EISA reaffirmed the 0.15 "multiplier," and it stated Congress's position that the country must "reduce the dependence of the United States on energy imported from volatile regions of the world that are politically unstable," and that "increased energy production from domestic renewable resources would attract substantial new investments in energy infrastructure, create economic growth, develop new jobs for the citizens of the United States, and increase the income for farm, ranch, and forestry jobs in the rural regions of the United States." [EPA-HQ-OAR-2010-0799-9506-A1, pp. 4-5]

As is often the case in state preemption and federal displacement cases, Congress did not address any possible conflict between the new CAFE statute and the much older CAA, which makes no mention of climate change or CO_2 regulation. But coming after the Supreme Court decision, there can be little question that if there is a conflict between the statutes, then the CAA must defer to the highly detailed 2007 legislation. At the very least, it is difficult to argue that EPA's CO_2 limits can be allowed to negate the multiplier. [EPA-HQ-OAR-2010-0799-9506-A1, p. 5]

Without acknowledging this potential conflict, EPA does request comment on whether natural gas vehicles should receive a CO_2 multiplier similar to that which EPA provides for electric vehicles. But EPA does not explain the basis for calculating the EV multiplier; it is therefore difficult to determine from the EV example how this should be done. An approach more clearly rooted in the statute would be to provide a CO_2 multiplier equivalent to the 0.15 multiplier EISA provides for alternative fuels, and make it similarly available to fuels like ethanol and natural gas. The result would be a CO_2 averaging number that companies could assign to non-petroleum cars in the same way that the 0.15 multiplier results in an mpg number for calculating a manufacturer's fleetwide average fuel economy. The agencies could in this way keep the two regulatory regimes from potentially troublesome legal conflict. [EPA-HQ-OAR-2010-0799-9506-A1, p. 5]

Organization: Chrysler Group LLC

Chrysler supports EPA's proposals regarding natural gas vehicles and recommends that the Agencies take steps to further harmonize the greenhouse gas and CAFE program treatment of the vehicles. (Attachment 4)

Current statutes and regulations limit the regulatory support for natural gas vehicles ("NGV"s). Chrysler recommends that the agencies establish a category of "extended-range" dual fuel NGVs which would be treated as dedicated NGVs. Chrysler supports EPA's proposal to weight dual fuel NGV fuel use using a utility factor-based approach. This approach is consistent with the expected real-world CNG utilization of this vehicle type. Given the additional expense of NGVs and the state of infrastructure development, Chrysler also supports EPA's proposed incentive multipliers for the production of these vehicles. [EPA-HQ-OAR-2010-0799-9495-A1, p. 6]

In his January 24, 2012 State of the Union Address, President Obama laid out a Blueprint for an America Built to Last, underscoring his commitment to an all-of-the-above approach that develops every available source of American energy. This commitment includes a plan to promote the safe, responsible development of the near 100-year supply of natural gas, supporting more than 600,000 jobs while ensuring public health and safety. Encouraging the development of the CNG refueling infrastructure and CNG vehicles supports this commitment. [EPA-HQ-OAR-2010-0799-9495-A1, p. 18]

Both dedicated and dual fuel compressed natural gas vehicles ("NGVs") represent a significant opportunity to reduce greenhouse gas emissions and to improve energy independence. The benefits of compressed natural gas include abundant domestic production, lower smog-forming and greenhouse gas emissions when burned, and a price advantage over gasoline. However, several roadblocks exist to the wide-spread adoption of NGVs. These include limited vehicle availability and a lack of public fueling infrastructure. [EPA-HQ-OAR-2010-0799-9495-A1, p. 18]

In the NPRM, the Agencies take positive steps towards enabling the successful deployment of NGVs, including the establishment of a utility factor-based method for dual fuel CNG vehicles. The Agencies can build on these positive first steps by developing a harmonized approach between the greenhouse gas and CAFE rules, extending EPA utilization of the NHTSA 15% fuel content factor under the greenhouse gas rules, and providing volume multipliers consistent with those proposed for electric and plug-in hybrid electric vehicles. [EPA-HQ-OAR-2010-0799-9495-A1, p. 18]

A special category of “extended-range” NGVs should be created

Chrysler believes that the creation of a special “extended-range” category for certain dual fuel NGVs would be helpful in encouraging manufacturers to produce NGVs while providing adequate reserve range where a re-fueling infrastructure is not readily available. This type of vehicle could provide significant CNG range, with a reserve of conventional fuel to reduce customer range anxiety. [EPA-HQ-OAR-2010-0799-9495-A1, p. 18]

Under current regulations, the incentives to undertake a dual fuel NGV are minimal for manufacturers which already meet the maximum dual fuel credit values through the production of dual fuel bio-fuel vehicles. If this special category of extended-range NGVs were treated, for regulatory purposes, as dedicated alternative fuel vehicles, this barrier would be removed and manufacturers would be incentivized to produce a greater number of NGVs, thereby also promoting infrastructure development. [EPA-HQ-OAR-2010-0799-9495-A1, p. 18]

Chrysler supports the proposed utility factor-based methodology to weight greenhouse gas emissions for dual fuel NGVs.

EPA proposes to apply a utility factor-based methodology to weighting greenhouse gas emissions on CNG and conventional fuel for dual fuel NGVs. Chrysler agrees that this approach is appropriate for this type of vehicle and will more accurately reflect the relative use of CNG and conventional fuels. As noted above, once the proportion of CNG to conventional fuel driving range exceeds a certain threshold, the Agencies should treat this type of vehicle as a dedicated alternative fuel vehicle. [EPA-HQ-OAR-2010-0799-9495-A1, p. 18]

The utility factor-based calculation should be made available for greenhouse gas and CAFE compliance purposes starting 2012MY.

Treatment of NGVs as Advanced Technology Vehicles

EPA requests comment on the merits of providing multipliers to NGVs similar to those for electric and plug-in hybrid electric vehicles. Chrysler supports this approach to providing regulatory incentives for this beneficial technology. Such an approach not only improves the business case for NGVs, but also provides a more technology-neutral approach to reducing greenhouse gas emissions and oil consumption. Chrysler recommends that dedicated and “extended-range” natural gas vehicles receive at least the same multipliers as electric vehicles, and that dual fuel NGVs receive at least the same multipliers as plug-in hybrid electric vehicles. [EPA-HQ-OAR-2010-0799-9495-A1, p. 19]

EPA is proposing “to allow the option, at the manufacturer’s discretion, to use the proposed utility factor-based methodology” for model year 2012-2015 greenhouse gas compliance calculations. Chrysler supports this proposal. [EPA-HQ-OAR-2010-0799-9495-A1, p. 19]

EPA further proposes to begin use of the utility factor-based approach for CAFE purposes starting in model year 2020. The goal of harmonizing greenhouse gas and CAFE compliance requirements would be best served if these vehicles were treated the same under both programs by using the utility factor-based approach in CAFE compliance calculations. [EPA-HQ-OAR-2010-0799-9495-A1, p. 19]

EPA should continue to apply the 15% fuel content factor to greenhouse gas emissions through 2025 model year.

Under current regulations, for model years 2012 through 2015, the greenhouse gas emissions for dual fuel NGVs are multiplied by a 0.15 fuel content factor, similar to their treatment in the CAFE program. In the 2016 and later model years, this fuel content factor is discontinued for greenhouse gas emission purposes, resulting in reduced harmonization with the CAFE program. To increase harmonization of the two programs, and to incentivize production of NGVs, EPA should extend this 0.15 fuel content factor through the 2025 model year, consistent with the CAFE program. [EPA-HQ-OAR-2010-0799-9495-A1, p. 19]

Organization: Clean Energy

PRESIDENT OBAMA'S COMMENTS ON NATURAL GAS VEHICLES ON JANUARY 26, 2012. [EPA-HQ-OAR-2010-0799-9511-A1, p.2]

On January 26, 2012, the President of our United States shared his views on the importance of natural gas use in vehicles at a Clean Energy refueling station serving the United Parcel Service in Las Vegas, Nevada. His remarks were so important, that we felt compelled to include them in our comments. Below is an important excerpt of his speech that day (emphasis in 'bold' added). [EPA-HQ-OAR-2010-0799-9511-A1, p.2]

Now, part of my blueprint and what I want to focus on a little bit today is for on economy built to last with American energy. That's why we're here. For decades, Americans have been talking about how do we decrease our dependence on foreign oil. Well, my administration has actually begun to do something about it. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

Over the last three years, we negotiated the toughest new efficiency standards for cars and trucks in history. We've opened millions of new acres for oil and gas exploration. Right now, American oil production is the highest that it's been in eight years. Eight years. Last year, we relied less on foreign oil than in any of lost 16 years. That hasn't gotten a lot of attention, but that's important. (Applause.) We're moving in the right direction when it comes to oil and gas production. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

And today, I'm announcing that my administration will soon open up around 38 million acres in the Gulf of Mexico for additional exploration and development, which could result in a lot more production of domestic energy. (Applause.) [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

But as I said on Tuesday, and as the folks here at UPS understand, even with all this oil production, we only have about 2 percent of the world's oil reserves. So we got to have an all-out, all-in, all-of-the-above strategy that develops every source of American energy - a strategy that is cleaner and cheaper and full of new jobs. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

Now, a great place to start is with natural gas. Some of you may not have been following this, but because of new technologies, because we can now access natural gas that we couldn't access before in an economic way, we've got a supply of natural gas under our feet that can last America nearly a hundred years. Nearly a hundred years. Now, when I say under our feet, I don't know that there's actually gas right here. (Laughter.) I mean in all the United States. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

And developing it could power our cars and our homes and our factories in a cleaner and cheaper way. The experts believe it could support more than 600,000 jobs by the end of the decade. We, it turns out, are the Saudi Arabia of natural gas. (Applause.) We've got a lot of it. We've got a lot of it. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

Now, removing that natural gas obviously has to be done carefully. And I know that there are families that are worried about the impact this could have on our environment and on the health of our communities. And I share that concern. So that's why I'm requiring - for the first time ever -- that aft companies drilling for gas on public lands disclose the chemicals they use. We want to make sure that this is done properly and safely. (Applause.) America will develop this resource without putting the health and safety of our citizens at risk. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

But we've got to keep at it. We've got to take advantage of this incredible natural resource. And think about what could happen if we do. Think about an America where more cars and trucks are running on domestic natural gas than on foreign oil. Think about an America where our companies are leading the world in developing natural gas technology and creating a generation of new energy jobs; where our natural gas resources are helping make our manufacturers more competitive for decodes. We can do this. And by the way, natural gas bums cleaner than oil does, so it's also potentially good for our environment as we make this shift. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

So lost April, we issued II challenge to shipping companies /Ike UPS. We sold if you upgrade your fleets to run on less oil or no oil at all, we're going to help you succeed. We wont to help you with that experiment. So we started out with five companies that accepted the challenge. And of course, UPS was one of the first. That's how they roll. (Laughter and applause.) [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

So less than a year later, we've got 14 companies an board, and together they represent 1 million vehicles on the rood. That's a lot of trucks. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

We should do more, though. And that's why we're here today. First, let's get more of these natural gas vehicles on the road. Let's get more of them on the road. (Applause.) The federal fleet of cars is leading by example. Tums out the federal government has a lot of cars. (Laughter.) We buy a lot of cars. So we've got to help not only the federal government but also local governments upgrade their fleet. If more of these brown trucks are going green, mare city buses should, too. There's no reason why buses can't go in the some direction. [EPA-HQ-OAR-2010-0799-9511-A1, p.3]

Second, let's offer new tax Incentives to help companies buy more clean trucks like these. (Applause.) [EPA-HQ-OAR-2010-0799-9511-A1, p.4]

Third, let's make sure all these new trucks that are running on natural gas hove places to refuel. That's one of the biggest impediments, is the technology. We know how to make these trucks, but if they don't have a place to pull in and fill up, they got problems. [EPA-HQ-OAR-2010-0799-9511-A1, p.4]

So we're going to keep working with the private sector to develop up to five natural gas corridors along our highways. These are highways that have natural gas fueling stations between cities, just like the one that folks at UPS, South Coast Air and Clean Energy Fuels are opening today between Las Angeles and Salt Lake City. That's a great start. (Applause.) So now one of these trucks can go from Long Beach all the way to Salt Lake City. And they're going to be able to refuel along the way. [EPA-HQ-OAR-2010-0799-9511-A1, p.4]

And finally, to keep America on the cutting edge of clean energy technology, I want my Energy secretary, Steven Chu, to launch a new competition that encourages our country's brightest scientists and engineers and entrepreneurs to discover new breakthroughs for natural gas vehicles. [EPA-HQ-OAR-2010-0799-9511-A1, p.4]

So we're going to keep moving on American energy. We're going to keep boosting American manufacturing. We're going to keep training our workers for these new jobs. But an economy that's built to last also means a renewal of the values that made us who we are: hard work, fair play and shared responsibility. [EPA-HQ-OAR-2010-0799-9511-A1, p.4]

The Proposed Regulatory Incentives for NGVs Do Not Reflect the President's Vision [EPA-HQ-OAR-2010-0799-9511-A1, p.4]

Clean Energy found that the incentives outlined in the proposed rule for NGVs are not adequate or consistent, especially when compared to electric vehicle incentives, to support greater natural gas vehicle adoption and advancement as the President urged his Administration to do last month. For dedicated NGVs after 2016, the 0.15 divisor would no longer be available, so GHG incentives for manufacturers would be negligible. For dual fuel vehicles, the use of the 0.15 divisor would end after 2015 - virtually eliminating the value of dual-fuel vehicle GHG benefits. [EPA-HQ-OAR-2010-0799-9511-A1, pp.4-5]

If the purpose of these regulations is to encourage manufacturers to produce vehicles that produce fewer greenhouse gases, this aspect of the proposed rules makes little sense. NGVs produce less GHGs than comparable gasoline vehicles - especially when the upstream emissions are considered. Without continued use of the 0.15 divisor for dual-fuel GHG calculations, the incentive for manufacturers to produce NGVs would be significantly reduced. [EPA-HQ-OAR-2010-0799-9511-A1, p.5]

Clean Energy's Recommends the Following Changes [EPA-HQ-OAR-2010-0799-9511-A1, p.5]

1. Provide Dual-Fuel NGVs a separate Track from E85 Vehicles [EPA-HQ-OAR-2010-0799-9511-A1, p.5]

The large number of E85 vehicles being manufactured, in effect, nullifies the value of other dual-fuel vehicle FE credits. Clean Energy recommends that the agencies develop a separate track for dual-fuel NGVs to make the incentives truly effective. Dual-fuel NGVs (and any other alternative fuel vehicles) certified under this track should earn unlimited (uncapped) FE and GHG credits. [EPA-HQ-OAR-2010-0799-9511-A1, p.5]

2. Apply the Utility Factor for Dual-Fuel NGVs for GHG and FE Credits In 2012 [EPA-HQ-OAR-2010-0799-9511-A1, p.5]

The utility factor (UF) should apply to dual-fuel vehicles beginning with MY 2012 for GHG and FE credits as the agencies have articulated sufficient legal justification for adopting the use of the utility factors for fuel economy for MY 2020 forward, and EPA has already proposed making the utility factors retroactive back to 2012 for GHG certification. This same rationale supports extending the utility factor to the FE calculations prior to 2020. Providing one credit but not the other is highly problematic and is not consistent with the intent of harmonization under one single national fuel economy/greenhouse gas program. That is why some credit provisions in the rules (e.g., FFVs, EVs, hybrid trucks) attempt to provide periods where both incentives overlap. Combining the incentives and providing consistent treatment of FE and GHG credits for dual-fuel NGVs is extremely important to ensure compliance with these extremely complex regulations. [EPA-HQ-OAR-2010-0799-9511-A1, p.5]

3. Apply the 0.15 GHG Divisor Beyond 2015 [EPA-HQ-OAR-2010-0799-9511-A1, p.5]

The use of the 0.15 divisor for GHGs for both dual-fuel and dedicated NGVs currently terminates after 2015 making them ineffective. These credits must be extended beyond 2015 so that manufacturers have sufficient time to respond to them and they should remain in place until a certain market penetration is achieved. Such a phase-out of incentives would be consistent with the approach taken with respect to electric drive vehicles. We believe that providing these credits until a manufacturer's sale of NGVs reaches several hundred thousand (300,000 in the case of EVs) is warranted. [EPA-HQ-OAR-2010-0799-9511-A1, p.5]

Sales Multipliers [EPA-HQ-OAR-2010-0799-9511-A1, p.6]

In its notices, the agencies have asked for comment on whether to provide a production or sales multiplier for dedicated and dual-fuel NGVs. The agencies have proposed adopting such multipliers for other technologies (e.g., a multiplier of 1.3-2.0 is proposed for EVs, FCVs, and

PHEVs) for 2017 - 2021. In order to ensure equitable treatment, the agencies should provide similar credits to NGVs. And since EVs and other electric-drive vehicles already receive extremely generous treatment in the rules, we believe that the provision of a sales multiplier for NGVs should be in addition to any other credits also provided for NGVs in order to further encourage manufacturers to offer such vehicles. In terms of credit values, we support NGV America's proposal that dedicated NGVs should be treated like EVs and that dual fuel NGVs should be treated like PHEVs. The result of this more equitable treatment would be to provide a level playing field to incentivize the manufacture of all alternative fuel vehicles and not favor one technology over another. Therefore, we support NGV America's proposed multiplier credits for NGVs: [EPA-HQ-OAR-2010-0799-9511-A1, p.6] [For the associated figure, please refer to EPA-HQ-OAR-2010-0799-9511-A1, p.6]

Clean Energy once again would like to thank EPA and NHTSA for the opportunity to provide comments on this important rule. While we certainly appreciate the inclusion of NGV incentives in the current proposal, we strongly believe that they need to be enhanced in order to be effective. Further, we believe it is in the agencies' best interest to do so as NGVs provide an opportunity to significantly displace foreign oil, harness a domestic resource that can help create American jobs and boost American businesses, while significantly reducing greenhouse gas emissions generated on American roads. [EPA-HQ-OAR-2010-0799-9511-A1, p.7]

Organization: Edison Electric Institute (EEI)

C. If Offered, Incentives for Compressed Natural Gas Vehicles Should Not Be “Equivalent” to Incentives for EVs. [EPA-HQ-OAR-2010-0799-9584-A2, p. 8]

EPA requests comment on the merits of providing similar incentives as proposed for EVs to dedicated and/or dual fuel compressed natural gas (CNG) vehicles. See 76 Fed. Reg. at 75013. EPA should not provide similar multiplier incentives for CNG vehicles. While CNG vehicles reduce GHG emissions from LDVs, when compared to traditional fuel vehicles, they do not reduce tailpipe emissions of all pollutants (GHGs and criteria air pollutants) to 0.0 g/mile.4 Accordingly, EPA should not allow manufacturers to count CNG emissions as 0.0 g/mile when calculating compliance averages. [EPA-HQ-OAR-2010-0799-9584-A2, pp. 8-9]

CNG vehicles could play an important role to play in the diversification of transportation-sector fuels, particularly in the fleet and medium-duty sectors. If EPA believes that some sort of incentive for CNG vehicles is necessary, EPA must take into consideration the fact that CNG is comprised primarily of methane, a GHG that has a 100-year global warming potential (GWP) 25 times greater than that of carbon dioxide. To the extent that EV incentives are discounted to reflect the upstream emissions related to electricity generation and transmission, any incentives for CNG vehicles also must be discounted to reflect not only methane’s higher GWP, but also the upstream emissions related to natural gas production and transportation.5 [EPA-HQ-OAR-2010-0799-9584-A2, p. 9]

Organization: Encana Natural Gas Inc.

Natural gas vehicles can play an important role in increasing fuel efficiency and reducing vehicle emissions. Compared with traditional and available alternative fuels, natural gas can deliver material emission reductions of greenhouse gases ('GHGs'), criteria pollutants and hazardous air pollutants. America's affordable, abundant natural gas resources can help the u.s. achieve greater energy independence in the transportation sector. [EPA-HQ-OAR-2010-0799-9585-A2, p. 1]

As one of the largest producers of natural gas in North America and a strong proponent of clean, abundant, affordable, and domestic natural gas. Encana is an example of an early mover by adopting natural gas vehicles ('NGVs') in our own fleet. At the end of 2011, Encana had 15% of its vehicle fleet transitioned to dedicated or bi-fuel natural gas, along with 6 CNG and 1 LNG fueling stations operating to service its own fleet, those of our contractors and the public. Encana intends to continue transitioning its fleet vehicles to CNG, as well as opening new stations for CNG and LNG. [EPA-HQ-OAR-2010-0799-9585-A2, p. 1]

Natural gas as a transportation fuel is not a new concept with growing utilization in U.s. fleet vehicles and wide acceptance internationally. Unlike other alternative vehicle technologies, natural gas vehicles are not in need of early stage technology support which has an inherently uncertain future. In fact, proven technology makes natural gas the recognized leader in affordable alternative fuels. To accelerate market acceptance, it is necessary to promote a clean domestic energy supply through production incentives. Incentives for Original Equipment Manufacturers ('OEMs') are critical to ensure market penetration of NGVs matches the pace of natural gas fueling infrastructure build-out. [EPA-HQ-OAR-2010-0799-9585-A2, p. 2]

As outlined in detail below, Encana respectfully requests that the EPA and NHTSA avoid picking technology winners and give all viable alternative fueled vehicles the opportunity for accelerated market acceptance. All alternative fueled vehicles should be treated equally. [EPA-HQ-OAR-2010-0799-9585-A2, p. 2]

GHG and Other Emission Benefits of Natural Gas Fuel

Clean burning natural gas offers many advantages over other fossil fuels such as gasoline and diesel. Natural gas is composed of nearly 100% methane, which has a simple molecular structure with one carbon atom per molecule. Due to this simple molecular structure, natural gas has the lowest carbon content of any of the commonly used fuels in the United States. Natural gas contains approximately 74% of the carbon content of gasoline per unit of energy produced (EPA 2010). As such, replacing traditional transportation fuels with natural gas can reduce GHG emissions by about 25%. [EPA-HQ-OAR-2010-0799-9585-A2, p. 2]

Additionally, natural gas combustion produces lower emissions of several other pollutants including sulfur dioxide, hazardous air pollutants, volatile organic compounds, and fine particulate matter. [EPA-HQ-OAR-2010-0799-9585-A2, p. 2]

Availability and Abundance of Natural Gas

As noted above, natural gas is an abundant resource in North America presenting over 100 years of supply at current consumption levels. The U.s. Energy Information Agency ('EIA') recognizes the significant new supplies of natural gas in the Annual Energy Outlook ('AEO') 2012 Early Release Overview forecasting greater demand for natural gas and lower prices over the same time period. Recent shale gas discoveries, technological innovation and the on-going expansion of the natural gas pipeline network are combining to make natural gas available throughout the continental United States. [EPA-HQ-OAR-2010-0799-9585-A2, p. 2]

According to the EIA AEO 2011, production from shale formations in the United States grew by an average annual rate of 17% per year from 2000 to 2006. While 17% is impressive for those years, in the years from 2006 to 2010, United States shale gas production grew by an average annual growth rate of 48%[1]. The natural gas industry will continue to find new shale gas resources and by using enhanced technologies such as horizontal drilling and hydraulic fracturing, this success rate will continue to outpace demand. [EPA-HQ-OAR-2010-0799-9585-A2, p. 2]

Affordability of Natural Gas [EPA-HQ-OAR-2010-0799-9585-A2, p. 2]

According to the AEO 2012 Early Release Overview, with increased domestic natural gas production, average annual wellhead prices for natural gas remain below $5 per thousand cubic feet (2010 dollars) through 2023 in the AE02012 Reference case. These projections are reflective of natural gas decoupling from international crude oil market prices. US consumers can now take advantage of the stable and low natural gas prices that will be realized through the life of this proposed rule. [EPA-HQ-OAR-2010-0799-9585-A2, pp. 2-3]

Advantages of a Domestic Fuel Supply

The US is in dire need of job growth to enable an economic recovery and the natural gas industry can provide a significant boost towards this end. In fact, during President Barak Obama's 2012 State of the Union Address, he highlighted a potential to grow 600,000 jobs producing domestic oil and gas in this decade alone. [EPA-HQ-OAR-2010-0799-9585-A2, p. 3]

Regulatory Incentives for 2012 2015

Under existing regulations, the EPA and NHTSA attempt to provide incentives to encourage manufacturers to produce dual-fuel NGVs in 2012 -2015 by providing favorable treatment of greenhouse gas GHG emissions and fuel economy ('FE') credits. This is done, in part, by using a multiplier (0.15) to compute GHG credits and a divisor (0.15) to compute FE levels. The use of the 0.15 divisor was first authorized for FE calculations as part of the Alternative Motor Fuels Act of 1988 (P. 1. No. 100-94). [EPA-HQ-OAR-2010-0799-9585-A2, p. 3]

As part of the current rulemaking, the EPA proposed modifying its regulations for MY 2012 and later years to improve the GHG credits provided for dual-fuel NGVs. The proposed change would include the use of a utility factor ('UF') to determine the percentage of time a vehicle is deemed to operate on alternative fuel. [EPA-HQ-OAR-2010-0799-9585-A2, p. 3]

Encana supports the EPA and NHTSA's previous decision to use the 0.15 factor to compute GHG and FE credits in MYs 2012 - 2015. We also support the proposal in this rulemaking to use

UFs to compute GHG emissions (and eventually FE-see below) for dual-fuel vehicles. [EPA-HQ-OAR-2010-0799-9585-A2, p. 3]

However, Encana wishes to point out several inconsistencies in the existing and proposed rules that undermine or eliminate the intended benefits of those rules. [EPA-HQ-OAR-2010-0799-9585-A2, p. 3]

First, the benefit of the FE credits is limited or non-existent since there currently are restrictions on the total amount of fuel economy credits manufacturers can use for dual fuel and flex-fuel vehicles. Federal law prescribes an upper bound on the maximum amount of fuel economy credit a manufacturer may earn and phases-out the credits after 2019 (although they are reinstated without a cap beginning 2020). Because of the significant number of E85 vehicles offered by manufacturers, it is expected that manufacturers will reach their fuel economy credit limit primarily via their E85 products. Any additional offerings of dual fuel NGVs will probably not earn the automakers any usable FE credits in MYs 2012 - 2015. There needs to be another avenue - not blocked by E85 vehicles - for manufacturers to take advantage of the FE credits generated by dual fuel NGVs. [EPA-HQ-OAR-2010-0799-9585-A2, p. 3]

Second, it is true that manufacturers that offer dual-fuel NGVs will earn enhanced GHG credits for MY 2012 - 2015 vehicles, and the value of these GHG credits will be further improved by the use of the proposed utility factors. However, manufacturers are unlikely to find these GHG credits sufficiently attractive to produce dual-fuel NGVs (even if the credits can be carried forward for use in later years) unless they can simultaneously earn enhanced GHG and FE credits. [EPA-HQ-OAR-2010-0799-9585-A2, p. 3]

It should be noted that, for 2012-2015, dedicated NGVs would continue to be of value to OEMs. They qualify for FE credits and there is no cap that limits the amount of the credits that manufacturers can use. The 0.15 factor also applies to dedicated vehicles' FE and GHG calculations. While we certainly support the proposed incentives for dedicated vehicles, it is also important to provide meaningful incentives for dual-fuel NGVs. Most consumers and even some fleets are likely to prefer dual-fuel vehicles over dedicated vehicles while natural gas fueling infrastructure continues to expand. [EPA-HQ-OAR-2010-0799-9585-A2, p. 4]

Regulatory Incentives for 2016 & Beyond

The incentives proposed for 2016 and beyond (as explained below) do not provide adequate or consistent incentives for NGVs (especially as compared to electric vehicles (EVs')) and, therefore, are unlikely to be adequately effective. [EPA-HQ-OAR-2010-0799-9585-A2, p. 4]

For dedicated NGVs, the proposed rules would continue to use the existing 0.15 FE divisor in 2016 and beyond (as required by law). For GHG calculations, after 2016, the 0.15 divisor would no longer be available, so GHG incentives for manufacturers are negated while EVs, hybrids during electric operation and fuel cell vehicles continue to enjoy a 0 g/mi tailpipe emission rate. [EPA-HQ-OAR-2010-0799-9585-A2, p. 4]

For dual fuel vehicles, the proposed rules would also continue to use the existing 0.15 divisor for FE in 2016 and beyond (as required by law). For FE purposes during 2016-2019, dual-fuel vehicles would be assumed to operate 50/50 on natural gas and petroleum. However, the need for FE credits, already limited by the cap and the production of E85 vehicles, would be further constrained by declining the cap. From 2020, the 50/50 rule would be replaced by the use of the UF. [EPA-HQ-OAR-2010-0799-9585-A2, p. 4]

For GHG emissions for dual fuel vehicles, the use of the UF also would replace the use of the 50/50 rule from 2012 and thereafter. However, the use of the 0.15 multiplier would end after 2015 - virtually eliminating the value of dual fuel vehicle GHG benefits. This aspect of the proposed rule fails to satisfy one of the primary drivers of the rule: to encourage manufacturers to produce vehicles that produce fewer GHGs. [EPA-HQ-OAR-2010-0799-9585-A2, p. 4]

Encana's Recommended Changes

1. Provide a Separate Track for Dual-fuel NGVs

As discussed above, the large number of E85 vehicles, in effect, nullifies the value of dual-fuel vehicle FE credits. Encana recommends that, in order to make the incentives for dual-fuel NGVs truly effective, the agencies should develop a separate certification and FE calculation track for these vehicles. Dual-fuel NGVs, and any other alternative fuel vehicles except E85 vehicles, certified under this track would earn unlimited and uncapped FE and GHG credits. [EPA-HQ-OAR-2010-0799-9585-A2, p. 4]

2. Apply the Utility Factor for Both GHG and FE Beginning in 2012 [EPA-HQ-OAR-2010-0799-9585-A2, p. 4]

The utility factors should apply to dual-fuel vehicles beginning with MY 2012 for GHG and FE credits. The agencies have articulated sufficient legal justification for adopting the use of the utility factors for fuel economy for MY 2020 forward, and the EPA has already proposed making the utility factors retroactive back to 2012 for GHG certification. This same rationale supports extending the utility factor to the FE calculations leading up to 2020. The EPA and NHTSA appear to understand that providing one credit but not the other is highly problematic. That is why some credit provisions in the rules (e.g., FFVs, EVs, hybrid trucks) attempt to provide periods where both incentives overlap. Combining the incentives and providing consistent treatment of FE and GHG credits for NGVs is extremely important in ensuring compliance with these extremely complex regulations and further promoting GHG reductions in the transportation sector. [EPA-HQ-OAR-2010-0799-9585-A2, pp. 4-5]

3. Continue the Use of the 0.15 GHG Multiplier Beyond 2015

As discussed above, the use of the 0.15 multiplier for GHGs for both dual fuel and dedicated NGVs currently terminates after 2015. But, these credits in order to be effective must be extended beyond 2015. OEMs have already made preparations for MYs 2012-2015 and are unlikely to have sufficient time to respond to these incentives in that short timeframe. Therefore, to encourage more NGVs, the EPA and NHTSA should extend the credits provided for NGVs until a certain market penetration is achieved. The phase-out of such incentives should be consistent with the approach taken with respect to electric drive vehicles. Enhanced credits for NGVs would only expire after reaching a certain level of market penetration. We believe that providing these credits until a manufacturer's sale of NGVs reaches several hundred thousand (300,000 in the case of EVs) is warranted. [EPA-HQ-OAR-2010-0799-9585-A2, p. 5]

4. Other Credit Provisions

In addition to urging the agencies to adopt the incentive described above, we offer the following comments with respect to several other incentives proposed as part of this rulemaking (i.e., the use of sales multipliers, and advanced pickup truck credits). [EPA-HQ-OAR-2010-0799-9585-A2, p. 5]

Sales Multipliers

In its notices, the agencies have asked for comment on whether to provide a production or sales multiplier for dedicated and dual fuel NGVs. The agencies have proposed adopting such multipliers for other technologies (e.g., a multiplier of 1.3 - 2.0 is proposed for EVs, FCVs, and PHEVs) for 2017 - 2021. These credits appear to be limited to GHG credits. In order to ensure equitable treatment, the agencies should provide similar credits to NGVs. We believe that a sales multiplier for NGVs should be in addition to any other credits also provided for NGVs in order to further encourage manufacturers to offer such vehicles. In terms of credit values, we believe that dedicated NGVs should be treated like EVs and that dual-fuel NGVs should be treated like PHEVs. Therefore, we propose the following multiplier credits for NGVs: [See table on p. 5 of Docket number EPA-HQ-OAR-2010-0799-9585-A2] [EPA-HQ-OAR-2010-0799-9585-A2, p. 5]

• For dual fuel NGVs, provide a separate certification and FE calculation track and allow unlimited and uncapped FE and GHG credits;

• Allow UF use for both GHG and FE calculations through 2019;

• Extend the 0.15 GHG multiplier beyond 2015 and provide a phase out that is similar to EVs;

• Provide Sales Multipliers for NGVs;

Encana appreciates the opportunity to provide public comment on this rulemaking. Encana requests that the EPA and NHTSA incorporate the additional incentives described in this letter for natural gas vehicles. The following summarizes the additional incentives Encana believes will provide fair and equitable treatment of NGVs: [This comment can also be found in section 5 of this comment summary] [EPA-HQ-OAR-2010-0799-9585-A2, p. 7]

Natural gas vehicles can play an important role in increasing fuel efficiency and reducing vehicle emissions. Accelerating NGV market acceptance by providing NGV incentives for the OEMs will aid our country's goal of energy independence in the transportation sector. Compared with traditional and available alternative fuels, natural gas can also deliver material emission reductions of GHGs, criteria pollutants and hazardous air pollutants. [EPA-HQ-OAR-2010-0799-9585-A2, p. 7]

---

1 The Annual Energy Outlook 2011 is used since the AEO 2012 Early Release does not provide this level of granularity.

Organization: Ford Motor Company

EPA further requested comment on the merits of providing similar multipliers for dedicated and/or dual fuel compressed natural gas vehicles. Ford supports providing multipliers for natural gas fueled vehicle, and further requests that the same multiplier be provided for dedicated and/or dual fuel liquefied petroleum gas vehicles. Both gaseous fuels provide substantial reductions in greenhouse gas emissions, as well as support the diversification of our energy supply, providing greater energy security. However, the vehicle technologies required to allow operation on these fuels is expensive, and the market availability of the fuel, similar to the availability of public charging stations for electric vehicles, remains very limited. Therefore, we believe that the multiplier is appropriate to encourage the investment in these technologies for broader new vehicles applications, and drive the volumes that will encourage greater investment in the necessary re-fueling infrastructure. We further recommend that the credit values for dedicated and bi-fuel gaseous vehicles be aligned with those provided for dedicated and bi-fuel electricity fueled vehicles. [EPA-HQ-OAR-2010-0799-9463-A1, p. 18]

Organization: Manufacturers of Emission Controls Association (MECA)

MECA also believes that EPA's proposed advanced technology vehicle credits should be expanded to include other ultra-low GHG vehicle technologies beyond battery electric vehicles, plug-in hybrids, and fuel cell electric hybrids. MECA believes that it is important for these advanced technology vehicle credits to be technology neutral in order to provide a more level playing field that encourages vehicle manufacturers to put into the market a range of technologies that can offer significant reductions in GHG emissions. Examples of other types of advanced vehicles that should also be considered for such credits are dedicated natural gas vehicles or vehicles that employ carbon emission capture strategies. MECA believes that it is too early in the development process for EPA to pick advanced technology vehicle "winners." MECA urges EPA to expand the vision of advanced technology vehicle credits in its final rule with a more technology neutral approach. [EPA-HQ-OAR-2010-0799-9452-A3, p.4]

Organization: Mercedes-Benz USA, LLC

DAG also suggests that EPA consider a multiplier for dedicated CNG vehicles. While electric and fuel cell vehicles are likely to dominate in the advanced technology vehicle space during this timeframe, both dual fueled and dedicated CNG vehicles take advantage of the United States' abundant supply of natural gas to provide an alternative energy source. As with battery electric and fuel cell vehicles, supporting CNG vehicles in the fleet will take substantial amounts of infrastructure development. The potential for CNG vehicles to contribute to the future U.S.

vehicle fleet should be supported along with battery electric vehicles. Incentives should not be limited to dual-fueled vehicles using CNG. An incentive program should be applied to dedicated CNG vehicles as well.[12] In light of the infrastructure needs to support these vehicles, DAG suggests that a multiplier of 3 be attached to dedicated CNG vehicles. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-6]

---

12 Factory built CNG vehicles in the United States include the Honda Civic GX, the Chevy Express Van and the GMC Savanna Cargo Van. A number of vehicles are also supported by EPA Certified Conversion Kits, including the Dodge Ram 1500, Dodge Dakota, Chevy Impala, Chevy Silverado, Chevy Tahoe, Chevy Express, GMC Sierra, GMC Yukon, GMC Savanna, Cadillac Escalade, Ford Focus, Ford Transit Connect, Ford Fusion, Ford Expedition and Ford F-Series. These vehicles, and others, are candidates for factory built CNG support if provided with a GHG compliance credit.

Organization: National Propane Gas Association (NPGA)

NPGA believes it is imperative that the proposed rulemaking clearly establish parity among the various alternative vehicle fuels, including autogas, thereby removing any fuel bias or disincentive toward the production or sale of autogas fueled vehicles. We further believe that any manufacturing incentive such as a Gallon-Gasoline Equivalency (GGE) multiplying factor be implemented immediately and when authorized by statute, extended through 2025. A GGE value for autogas normalizes comparisons of fuel efficiencies[5]and reduced CO_2 emissions on a per mile basis for various alternative vehicle fuels. To this end, we believe the following discussion provides adequate substantiation to specifically codify a section in the final rule for autogas and its (GGE) value based upon energy density. [EPA-HQ-OAR-2010-0799-9482-A1, p. 3]

The need for a clearly codified GGE value and specific autogas provisions within the regulations is demonstrated by misleading government statistics comparing autogas to other alternative vehicle fuels. For example, the U.S. Energy Information Agency compares vehicle fuels in native units per fuel type[6]. Using estimates for native units per fuel type, autogas consumption for 2009 is found to be 175,177 thousand gallons and CNG is found to be 24,038 million cubic feet. However, using EIA's thousand gasoline-gallon equivalent values[7], autogas appears to have lost considerable market share disproportional to other fuels that have a GGE value. [EPA-HQ-OAR-2010-0799-9482-A1, p. 3]

The most dire consequence of omitting a GGE factor for calculating autogas CAFE credits results from the compounding effect realized when the Congressional allowance afforded alternative fuels to account for only 15% of fuel consumed is applied without the appropriate GGE value compensating for AFV energy densities. The 15% rule effectively increases the miles per gallon of autogas consumed by a factor of 6.67. And, applying the GGE factor to autogas miles per gallon produces a total CAFE credit equal to "miles per 9.2 gallons of propane (1.38 x 6.667)." For illustrative purposes, this means that for every dedicated propane vehicle that an OEM sells it would be able to claim a theoretical CAFE credit of 9.2 times the base vehicle's actual mpg. For every 20 mpg base-gasoline vehicle that an OEM manufactures using autogas, they receive a fleet credit of 6.67 miles per gallon of fuel consumed yielding an effective 133 mpg for their CAFE number. However, if the GGE factor of 1.38 is provided and applied for dedicated autogas fueled vehicles, the combined credits produce an effective CAFE credit of 184 mpg per vehicle. [EPA-HQ-OAR-2010-0799-9482-A1, pp. 3-4]

The following derivation compares autogas to gasoline on an energy content basis. Based upon the energy contents of autogas and gasoline, NPGA proposes that the CAFE standards specifically incorporate a GGE factor of 1.38 for autogas. [The derivation and Table 1 can be found on p. 4 of Docket number EPA-HQ-OAR-2010-0799-9482-A1] [EPA-HQ-OAR-2010-0799-9482-A1, p. 4]

The need to promote a GGE for propane is further supported by the similar approach for evaluating GHG emissions based upon energy density, i.e. “Carbon Equivalent Units” used by the U.S. Department of Energy’s Energy Information Administration[9]. [EPA-HQ-OAR-2010-0799-9482-A1, p. 4]

Full-Fuel-Cycle Analysis

NPGA believes it is imperative that the EPA/NHTSA establish principles implementing full-fuel- cycle (FFC) analysis consistent with accepted scientific findings and other government agencies. Evaluating GHG emissions from the vehicle’s tailpipe is consistent with current evaluation methodologies, but does little to accurately measure consumption of primary energy resources, emission of GHGs or smog forming pollutants attributable to the production of gasoline or the generation of electricity. Full-fuel-cycle measurement (well-to-wheels) captures the additional energy consumption and emissions derived from the extraction, processing, transportation, conversion, and distribution of energy to the vehicle. For electric and plug-in hybrid electric vehicles (EV and PHEV) that re-charge their batteries using power from the utility grid, point-of-use measurement such as a vehicle’s tailpipe misleads the consumer to believe the tailpipe is the only source of emissions and engine efficiency is the only source of energy consumption when, in fact, they are not. [EPA-HQ-OAR-2010-0799-9482-A1, p. 4]

NPGA commented on the EPA/NHTSA’s previous proposed rulemaking[10] on vehicle labeling discussing the positive attributes associated with using full-fuel-cycle energy metrics. We believe the EPA/NHTSA vehicle labels should provide consumers the more robust accounting of actual GHG emissions and energy efficiencies found with FFC measurement. We strongly believe to only present greenhouse gas performance values consistent with emissions measured at the tailpipe erodes any desired transparency of evaluating true fuel efficiencies and GHG emissions. In our opinion, to continue using point-of-use evaluations for vehicle emissions and fuel efficiencies is inaccurate and conveys only a partial story further promoting fuel biases. [EPA-HQ-OAR-2010-0799-9482-A1, pp. 4-5]

Scientific Findings

NPGA supports the use of the Source Energy and Emissions Analysis Tool[11] (SEEAT) developed by the Gas Technology Institute (GTI). This computer modeling tool calculates source energy and GHG emissions attributable to point-of-use energy consumption by vehicle fuel type.

SEEAT includes a source energy and carbon emission calculation methodology that accounts for primary energy consumption and related emissions for the full-fuel-cycle of extraction, processing, transportation, conversion, distribution, and consumption of energy. GTI researchers have calculated source-based fuel economies for various vehicle options and found more rational comparisons of vehicle efficiencies using ‘Source Fuel Economies’ than point-of-use fuel economies. [EPA-HQ-OAR-2010-0799-9482-A1, p. 5]

Another scientifically accepted modeling tool is the Greenhouse Gas, Regulated Emissions and Energy Use in Transportation (GREET) model developed by Argonne National Laboratory[12]. The GREET model estimates the upstream portion of the life-cycle GHG emissions of various vehicle fuels. This model calculates emissions in grams per million Btu, of multiple pollutants, including CO_2, CH_4, and N_2O to derive a total CO_2 equivalent. [EPA-HQ-OAR-2010-0799-9482-A1, p. 5]

NPGA supports the Department of Energy’s intended use of the GREET model to perform the national impact analyses and environmental assessments included in the review of proposed energy conservation appliance standards. Further affirming our support of the GREET model, the Propane Educational Research Council (PERC) conducted a study using the GREET model (version 1.8c) comparing autogas to other fuel sources. The study, titled “Propane Reduces Greenhouse Gas Emissions: A Comparative Analysis 2009” looked at thirteen (13) different applications where autogas was used including a GM 6.0L engine, Ford 150, Ford 250, school buses, forklifts, and commercial mowers. The comparisons looked at energy end-use and annual life-cycle GHG emissions for a variety of fuel sources. [EPA-HQ-OAR-2010-0799-9482-A1, p. 5]

A comparison by GTI found that the GREET and SEEAT vehicle source energy factors indicate excellent agreement between the two methodologies for both full-fuel-cycle efficiency factors and GHG emission factors. Minor differences appear to be based on underlying data sources and default values. Based on the national average fuel mix for electricity calculated using GTI’s SEEAT, the source energy conversion factor for electricity is 3.29 Btu/Btu. Conversion factors for fossil fuels directly consumed at the point-of-use are as follows: Natural gas: 1.09 Btu/Btu; Autogas: 1.12 Btu/Btu; Fuel oil: 1.13 Btu/Btu. [EPA-HQ-OAR-2010-0799-9482-A1, pp. 5-6]

It is NPGA’s contention that establishing a Gallon-Gasoline Equivalency for autogas, a clean burning alternative fuel, will provide automakers an incentive to manufacture autogas fueled light-duty vehicles. However, due to the lower energy density of autogas compared to gasoline, any legislation based upon “miles per gallon” obscures the positive benefits of using autogas. The CAFE standards provide a GGE value for CNG comparing equivalent energy densities instead of miles per equivalent volume of fuel and 49 U.S. Code 32905 provides gallon equivalents for gaseous fuels. In order to achieve parity among other alternative fuels, we believe that autogas should be treated comparably to CNG and other alternative fuels by providing its own unique section of regulation including its own GGE value based upon energy density. [EPA-HQ-OAR-2010-0799-9482-A1, p. 6]

NPGA respectfully requests the EPA/NHTSA codify by final rulemaking a Gallons of Gasoline Equivalency value of 1.38 for propane autogas establishing unambiguous parity among alternative light-duty vehicle fuels. [EPA-HQ-OAR-2010-0799-9482-A1, p. 6]

We also urge you to evaluate energy efficiency and GHG emission using FFC analysis thereby providing a complete and robust energy consumption and GHG emissions profile for all light-duty vehicles. Limiting emissions analysis to point-of-use metrics (tailgate emissions) ignores the fact that most energy losses associated with non-gaseous fuels, e.g. electricity, occur upstream and ignore greenhouse gas emissions. NPGA urges the EPA/NHTSA to account for upstream production and distribution emissions by applying readily available and scientifically accepted modeling technologies such as GREET and SEEAT. [EPA-HQ-OAR-2010-0799-9482-A1, pp. 6-7]

In today's world, consumers are repeatedly faced with making choices that are environmentally friendly and this observation is even more prevalent in the automotive industry. The shift by various federal agencies to a full-fuel-cycle analysis facilitates the ability of consumers to make informed decisions whom otherwise might not be aware of the environmental shortcomings of point-of-use energy analysis and labeling. Accurate and unbiased accounting of motor vehicle fuel efficiency and GHG emissions can be achieved today by using tools developed and accepted by the scientific community and readily available to the public. We believe these computer modeling tools should be harmonized across all federal agencies. And, to that end, we recommend that the promulgation of future GHG emissions and CAFE standards be established immediately recognizing FFC analysis and GGE energy values. [EPA-HQ-OAR-2010-0799-9482-A1, p. 7]

---

5 49 U.S.C. 32905 § 538.8 Gallon Equivalents for Gaseous Fuels

6 U.S. Energy Information Administration – Independent Statistics & Analysis, Renewable & Alternative Fuels, Estimated Consumption of Vehicle Fuels in Native Units, by Fuel Type, 2011

7 U.S. Energy Information Administration – Independent Statistics & Analysis, Renewable & Alternative Fuels, Estimated Consumption of Vehicle Fuels in the United States, by Fuel Type, 2011

9 Energy Information Administration (EIA), 2007. Voluntary Reporting of Greenhouse Gases Program.

10 NPGA 11/22/2010 Comments: (Docket ID Nos. EPA–HQ–OAR–2009–0865 and NHTSA 2010–0087 Revisions and Additions to Motor Vehicle Fuel Economy Label)

11 Source Energy and Emissions Analysis Tool, Carbon Management Information Center; Gas Technology Institute, July 2011

12 The Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model. Argonne National Laboratory, Center for Transportation Research. UChicago Argonne, LLC.

Organization: Natural Resources Defense Council (NRDC)

3. Dual Fuel Natural Gas Vehicles Require Further Constraints on Eligibility to Demonstrate Actual Natural Gas Use

NRDC believes that any emissions credits awarded to natural gas vehicles should be commensurate with real-world GHG reductions. Dual fuel natural gas vehicles that can be powered by onboard supplies of either natural gas or gasoline must have emission scores that reflect the actual use of each fuel. The use of a utility factor to represent the use of each fuel is a reasonable approach but further constraints on vehicle design on dual fuel natural gas vehicles must be included in the program for them to be eligible for separate natural gas and petroleum emissions accounting. If the design constraints are not met, the emissions ratings for dual fuel natural gas vehicles should be for operation only on gasoline. [EPA-HQ-OAR-2010-0799-9472-A2, p. 13]

The design constraints help ensure that the vehicle preferentially operates on natural gas. Dual fuel natural gas vehicles are powered by a combustion engine that can switch between gasoline and natural gas. If natural supplies are unavailable (or higher priced), then operation on gasoline might dominate. EPA has suggested several constraints that should be considered for adoption including “placing a minimum value on CNG tank size or CNG range, a maximum value on gasoline tank size or gasoline range, a minimum ratio of CNG-to-gasoline range, and requiring an onboard control system so that a dual fuel CNG vehicle is only able to access the gasoline fuel tank if the CNG tank is empty.”37 NRDC urges the agency to adopt some or all constraints before making dual fuel natural gas vehicles eligible for natural gas emissions ratings. The agencies should consider prioritizing a minimum requirement for natural gas-to-gasoline range of at least 80 percent on natural gas. [EPA-HQ-OAR-2010-0799-9472-A2, p. 13]

Organization: NGV America

These comments primarily focus on the incentives proposed in the rules. We strongly support the agencies’ efforts to craft incentives that will encourage automakers to accelerate the introduction of transformational technologies like natural gas vehicles (NGVs). In particular, we applaud the agencies for the incentives that have been proposed with respect to dedicated and dual-fuel NGVs. While much of the focus is on encouraging and facilitating the development of electric vehicles, the proposed rules do include some important, comparable provisions regarding the development of NGVs. We are encouraged by the inclusion of some incentives and the apparent recognition that natural gas fueled cars and trucks can and should be a part of transforming the U.S. automotive fleet. However, we believe that the incentives as proposed should be modified in order to be effective beyond the time period set out in the proposed rules and also to provide equitable treatment for NGVs. Given President’s Obama’s recent remarks concerning the benefits of NGVs and his desire to accelerate their use, we are extremely hopeful that the agencies will welcome the proposed changes we have offered here. [EPA-HQ-OAR-2010-0799-9461-A1, pp. 1-2]

At the outset it is important to clarify what we mean about transformational technologies. Transformational technologies in our view are those applications that have the potential to greatly change the transportation sector as it exists today. Any technology that has the ability to significantly reduce greenhouse gas and other emissions, lessen dependence on foreign oil, position the U.S. as an exporter of vehicle technology, and improve the economic well-being of our economy should be viewed as transformational. Natural gas and electric vehicles have these attributes As such, we believe any effort to stimulate the market for new technologies must be equitable in its treatment of natural gas and electric vehicles, and should not favor one over the other. [EPA-HQ-OAR-2010-0799-9461-A1, p. 2]

A. Benefits of Encouraging NGVs

An Abundant and Economical Domestic Resource

Reliance on foreign oil exacts a high toll on the U.S. in terms of direct economic costs and indirect energy security costs. During the three-year period from 2008 through 2010, the U.S. spent nearly $700 billion on imported petroleum. More recently, the cost of imported oil has been much higher as oil prices have once again exceeded $100 per barrel. In the coming decade, the U.S. Energy Information Agency (EIA) forecasts total expenditures for petroleum imports to top $3.3 trillion dollars.1 America's reliance on oil not only affects our trade balance but makes the U.S. vulnerable to price spikes and supply disruptions. And high oil prices results in a windfall for regimes that may not be friendly to the America. [EPA-HQ-OAR-2010-0799-9461-A1, p. 2]

Fortunately, the U.S. has an unprecedented opportunity to displace petroleum with domestic natural gas. As President Obama recently declared, the U.S. is "the Saudi Arabia of natural gas." The EIA, the Potential Gas Committee and other expert bodies now estimate that the U.S. has up to a 100 year supply of natural gas. The Potential Gas Committee's 2011 bi-annual report indicates that the U.S. now has a total future supply of 2,170 trillion cubic feet of natural gas. This is 89 Tcf more than estimated in the 2009 report. As was the case with the 2009 report, the 2011 report includes the highest resource estimate in the Committee's history. The availability of this significant domestic resource provides an unprecedented opportunity to solve a number of pressing national objectives like transforming the transportation sector. [EPA-HQ-OAR-2010-0799-9461-A1, pp. 2-3]

Increasing the use for natural gas in transportation will keep our economy growing by supporting new jobs and economic development. In 2008, U.S. production of 20 Tcf of natural gas supported nearly 3 million jobs.2 In his State of the Union remarks before Congress, the President indicated that new development of natural gas could result in 600,000 new jobs in this decade alone. Thus, increasing demand for natural gas as a transportation fuel will help put more people to work and ensure that we put this natural gas to good use. [EPA-HQ-OAR-2010-0799-9461-A1, p. 3]

Natural gas also benefits our economy because it is a low cost energy that helps businesses grow while at the same time controlling costs. Natural gas is priced much lower than petroleum. The two fuels no longer track one another -- and haven't for many years. The current contract price for natural gas (NYMEX) is trading at less than $3.00 per million Btu, and some analysts believe it could go below $2 per MMBtu. At $3.00 per MMBtu, the price of natural gas equates to a per-barrel of oil price of only $17.40 at a time when oil is trading near $100 a barrel. The low price of natural gas translates into significant savings for fleets and consumers who use natural gas to fuel their vehicles. In most areas of the country, natural gas sells at about a $1.50 discount compared to gasoline and diesel fuel. EIA's long-term forecast projects that differential between natural gas and petroleum fuels will remain as high as $2 per energy-equivalent unit. [EPA-HQ-OAR-2010-0799-9461-A1, p. 3]

Environmental Benefits

The same clean burning properties that make natural gas an excellent fuel for traditional applications like electricity generation, residential heating, and industrial applications, also make it an excellent fuel for transportation. Natural gas burns cleaner than gasoline and diesel fuel and most other transportation fuels as well. Not surprisingly, the first vehicles certified to the U.S. Environmental Protection Agency's (EPA) ultra-low emission, super-ultra low-emission and Tier 2/Bin 2 standards were NGVs. The natural gas-powered Honda Civic GX has won numerous awards for its outstanding environmental performance. In 2011, the Civic GX was rated the "Greenest Car in America" by the American Council for an Energy-Efficient Economy – for an amazing eight years in a row! It also was named the 2012 car of the year by the Green Car Journal. Compared to the gasoline Civic, the natural gas-powered Civic produces 95 percent fewer emissions of volatile organic compounds and 75 percent less emissions of nitrogen oxides – pollutants that contribute to ozone formation. [EPA-HQ-OAR-2010-0799-9461-A1, pp. 3-4]

The environmental benefits of NGVs are expected to continue to improve as new automotive technologies become available. EPA's own website describes natural gas as an inherently cleaner transportation fuel. That means that given the same amount of emissions control and technological advancement, natural gas should always produce lower emission than comparable gasoline and diesel-fueled vehicles. As long as the internal combustion engine is with us and as long as refinements to it are made, natural gas will be the cleanest transportation fuel to use in it. A National Academy of Science (NAS) report[3] that analyzed vehicle technologies as of 2005 and expected by 2030, projected that, with further expected improvements in vehicle technology and fuel efficiency, natural gas powered vehicles will provide superior benefits in terms of criteria pollutant reductions compared to nearly all other types of vehicles, even electric and plug-in hybrid electric vehicles. The reason, in part, is due to the fact that the internal combustion engine will continue to get much more fuel-efficient and cleaner, and internal combustion engines can always use natural gas. Electric vehicles sometimes use electricity produced from cleaner natural gas but they will likely continue to use electricity produced from coal, offsetting the benefits that otherwise would be provided by such vehicles. Electric vehicles also require more energy to produce them. [EPA-HQ-OAR-2010-0799-9461-A1, p. 4]

Natural gas vehicles will play a key role in reducing greenhouse gas emissions. Per unit of energy, natural gas contains less carbon than any other fossil fuel, and, therefore, produces lower carbon dioxide (CO_2) emissions per vehicle mile traveled. While NGVs do emit methane, another principal greenhouse gas, the increase in methane emissions is more than offset by a substantial reduction in CO_2 emissions compared to other fuels. The California Air Resources Board (CARB) has conducted extensive analyses on this issue, and has concluded that burning compressed natural gas produces about 22 percent less GHGs than burning diesel, and 29 percent less than burning gasoline.[4] The comparisons are based on well-to-wheels analyses, and include methane emissions. These reductions are equal to -- or better than -- some renewable liquid fuels. Most of the available studies show that given similar fuel efficiency, NGVs fueled by domestic natural gas will deliver about 20–30 percent improvement in GHG emissions. [EPA-HQ-OAR-2010-0799-9461-A1, p. 4]

Another important benefit of NGVs is that, in addition to the tailpipe reductions, they also provide upstream emission reductions of greenhouse gases. Therefore, any direct tailpipe reductions provided by introduction of NGVs resulting from this rulemaking will be increased by the additional emission offsets associated with upstream activities relative to petroleum upstream emissions, which these rules do not take into account. The fact that NGVs deliver these upstream emission reductions provides a rationale and quantifiable justification for providing additional emission reduction credits for NGVs in this rulemaking. These are real benefits that are provided not only by the NGVs incentivized by this rulemaking but also by NGVs sold after any incentives have expired. [EPA-HQ-OAR-2010-0799-9461-A1, p. 5]

The Potential for Natural Gas Vehicles

The current market for NGVs here in the U.S. is relatively small. Today, NGVs (and electric vehicles) are not yet economic for most owners of light-duty vehicles. The primary reason is that these vehicles have higher initial purchase costs than conventionally fueled vehicles, but are not driven enough miles or consume enough lower-cost fuel for the fuel cost savings that they offer to offset this higher purchase cost in a reasonable number of years. In fleet applications, however, where fuel consumption per vehicle is much greater, NGVs can be economically attractive to an increasing percentage of businesses and government agencies. [EPA-HQ-OAR-2010-0799-9461-A1, p. 5]

Outside the U.S., demand for NGVs is growing at a rapid pace, and much of this growth is in the light-duty vehicle market. In the last seven years, the global market for NGVs has more than tripled with a compound growth rate of over 17 percent per year. In fact, NGVs are the fastest growing alternative to petroleum vehicles in the world. In 2003, there were only about 2.8 million NGVs globally. Today, there are over 14 million NGVs in operation worldwide. This rapid growth points to the fact that rapid scaling up of NGVs is possible. The NGV Global (the international NGV association) forecasts that, by 2020, there will be 65 million NGVs on the world's roads. Unfortunately, the U.S. currently ranks fourteenth in the world in total number of NGVs – despite having more vehicles on the road than all the other fourteen countries combined. [EPA-HQ-OAR-2010-0799-9461-A1, p. 5]

As noted above, most of the new NGVs sold outside the U.S. are light-duty vehicles. Outside the U.S., tax and other government policies make NGVs even more economically attractive to consumers. As a result, in overseas markets, NGVs are now available from almost all major

OEMs, including: Ford, GM, Toyota, Honda, Nissan, Hyundai, Fiat, Volkswagen and Mercedes. In 2009, Fiat offered 14 separate NGV models, and more than 100,000 NGVs were sold in that year in Italy alone, comprising some 7 percent of the new vehicle market. Most U.S. manufacturers currently offer NGVs in Europe, South America and Asia, but only Honda currently offers a light-duty OEM NGV product in the U.S. -- the Honda Civic Natural Gas. [EPA-HQ-OAR-2010-0799-9461-A1, p. 5]

General Motor currently offers the GMC medium-duty Savana and Chevrolet Express vans as fully- backed, factory produced NGVs rated above 8,500 lbs. GVWR. And later this year, General Motors and Chrysler will begin offering factory built natural gas powered pickup trucks. As these offerings show, U.S. automakers certainly have the capability to produce NGVs – IF the proper incentives are in place. [EPA-HQ-OAR-2010-0799-9461-A1, p. 6]

Recent events are clearly pointing to a viable domestic market for light-duty NGVs. We are particularly encouraged by the unprecedented Memorandum of Understanding (MOU) concerning NGVs that has now been signed by ten state governors. The MOU urges U.S. automakers to expand their offerings of NGVs and attempts to stimulate the market for such vehicles by signaling the intent of these states to purchase NGVs. As noted above, in just the past two years, GM and Chrysler have announced plans to produce NGVs for the U.S. market. Honda also has expanded its production capacity for the Honda NGV offering, and is now marketing the car to consumers as well as fleets. Another telling factor is the significant growth in the aftermarket offerings here in the U.S., where nearly a dozen manufacturers offer systems to retrofit light-duty vehicles to operate on natural gas. These offerings include systems for the Fusion, Focus, Impala, Malibu, Milan, Transit Connect, in addition to a variety of popular pickup truck offerings. Ford, while not offering a factory NGV, has been working closely with the aftermarket industry to ensure that aftermarket systems offered for its vehicles meet its demanding standards for quality. These activities clearly show that there is very strong interest in bringing more NGV products to the U.S. passenger car and light-duty segment. [EPA-HQ-OAR-2010-0799-9461-A1, p. 6]

NGVAmerica believes that there could be a substantial market for NGVs in all applications, including the light-duty passenger car market. The most immediate opportunity for displacing petroleum and increasing the use of natural gas as transportation fuel lies with light-, medium- and heavy-duty fleets – especially trucks, buses and other heavier vehicles. America currently has a large selection of medium- and heavy-duty NGVs available in the U.S. and the market for natural gas trucks is beginning to ramp up. As a result, natural gas fueling infrastructure development is once again on the rise, recently exceeding 1,000 stations. More importantly, major industry players are now laying the groundwork for a national fueling infrastructure connecting major transportation routes across the country. Furthermore, President Obama's Blueprint for Energy, announced on January 26th, now calls for development of additional natural gas corridors. In that announcement, the President also called upon the Energy Department and national laboratories to focus their energies on bringing about technological breakthroughs in the use of natural gas as a transportation fuel. [EPA-HQ-OAR-2010-0799-9461-A1, p. 6]

These efforts will directly benefit the light-duty NGV market since increased fueling infrastructure is one of the key factors limiting the market for NGVs in the passenger car market. The economic outlook appears to be excellent. Lower natural gas prices and lower first cost premiums (brought about by mass production, economies of scale and more competition) mean that, in the future, even passenger cars could become economic. Adopting policies that encourage manufacturers to produce NGVs, just like policies that encourage manufacturers to offer EVs, are critically important. Tax policy certainly helps, and many in Congress -- as well as the President -- have indicated they support tax incentives for NGVs. But the Administration could do even more by adopting incentives for NGVs as part of this rulemaking. Just as with EVs, regulatory incentives combined with these other factors would help accelerate the introduction of NGVs into the light-duty passenger car market. [EPA-HQ-OAR-2010-0799-9461-A1, pp. 6-7]

Pathway to Hydrogen Fueled Vehicles

In addition to providing many near-term benefits, NGVs also likely will play an important role in facilitating the market penetration of fuel cell electric vehicles (FCEVs). Since the first wave of NGV adoption in the 1990s, the development of NGVs – and particularly natural gas refueling infrastructure – has long been recognized as a key bridge technology on a “path to hydrogen.”[5]Natural gas is largely composed of hydrogen, with four hydrogen atoms for every carbon atom in a molecule of methane. Due to the chemical and physical similarities of these two gases, they share a number of technology synergies, so that the proliferation of NGVs and natural gas fueling infrastructure will facilitate and accelerate deployment of FCEVs. Indeed, the development of the NGV market serves to reduce or eliminate all four of the near-term market barriers to FCEV adoption identified by the Agencies: [EPA-HQ-OAR-2010-0799-9461-A1, p. 7]

- Low-GHG Fuel Production and Distribution Infrastructure: NGV refueling infrastructure utilizes most of the same hardware (compressors, storage tanks, dispensers) that will be used to dispense hydrogen fuel, allowing natural gas refueling stations to be straightforwardly adapted for hydrogen dispensing. In fact, virtually all the hydrogen fueling component manufacturers are NGV fueling component manufacturers. Natural gas can also be used as a feedstock for hydrogen fuel production via distributed steam reforming at the refueling station, a fuel production pathway identified by the U.S. Department of Energy’s FreedomCAR & Fuel Partnership as the “most viable approach to begin building [the] hydrogen market in near term.” [6]Distributed steam reforming of natural gas for hydrogen production also yields just half of the lifecycle GHGs as production of hydrogen via electrolysis using grid electricity, according to Argonne National Laboratories’ GREET model.[7] [EPA-HQ-OAR-2010-0799-9461-A1, p. 7]
- Fuel Cost: Production of hydrogen from natural gas via distributed steam reformers also represents the “lowest current cost” hydrogen pathway compared to electrolysis and other methods, according to the FreedomCAR roadmap.[8] [EPA-HQ-OAR-2010-0799-9461-A1, p. 8]
- Vehicle Cost: NGV development will help reduce FCEV vehicle costs by advancing on-board gaseous storage and fuel management technologies, allowing more fuel to be stored safely with less weight and/or space. In a sense, the FCEV represents the ultimate

union of NGVs and EVs, with EVs providing the electric drive-train and NGVs ensuring the development of hydrogen storage technologies. [EPA-HQ-OAR-2010-0799-9461-A1, p. 8]

- Consumer Acceptance: By increasing familiarity and comfort with gaseous fuel vehicles and refueling, NGVs will help pave the way for consumer acceptance of FCEVs. NGV deployment will also serve the role of developing experience with gaseous-fueled vehicles for auto dealers, mechanics, and other important stakeholders that directly interface with consumers. [EPA-HQ-OAR-2010-0799-9461-A1, p. 8]

Thus, the market penetration of NGVs helps ensure that the necessary fuel and technologies will be in place for FCEVs, accelerating and lowering the costs of this transition. Much like the role that plug-in hybrid electric vehicles are playing in facilitating adoption of EVs, NGVs – and particularly dual-fuel NGVs (which mitigate “range anxiety” for early adopters) are essential for facilitating the market penetration of FCEVs. [EPA-HQ-OAR-2010-0799-9461-A1, p. 8]

B. Adopting Effective Regulatory Incentives

Regulatory Incentives for 2012 – 2015

Under the existing regulations, EPA and NHTSA attempt to provide incentives to encourage manufacturers to produce dual-fuel NGVs in 2012-2015 by providing favorable treatment of greenhouse gas (GHG) emission and fuel economy (FE) credits. This is done, in part, by using a divisor (0.15) to compute GHG and FE levels. The use of the 0.15 divisor was first authorized for FE calculations as part of the Alternative Motor Fuels Act (AMFA) of 1988 (P. L. No. 100-94). [EPA-HQ-OAR-2010-0799-9461-A1, p. 8]

As part of the current rulemaking, EPA also has proposed modifying its regulations for MY 2012 and later years to improve the GHG credits provided for dual-fuel NGVs, including the use of a “utility factor” to determine the percentage of time a vehicle is deemed to operate on alternative fuel. The current regulations calculate fuel economy and greenhouse gas emissions by assuming that dual-fuel vehicles operate only (and always) 50 percent of the time on conventional fuel and 50 percent of the time on alternative fuel. Like the 0.15 divisor, the 50/50 fuel consumption factor is prescribed in AMFA. The benefit of the proposed utility factor (UF)[9] is that, for most dual-fuel vehicles, the vehicles will be credited for operating more than 50 percent of the time on the alternative fuel. The UF takes into account typical consumer range requirements and a vehicles operational range on alternative fuel when calculating the percentage of time a vehicle is likely to operate on alternative fuel. The effect is that most dual-fuel natural gas vehicles will now be given credit for higher use of natural gas and lower GHG emissions. [EPA-HQ-OAR-2010-0799-9461-A1, pp. 8-9]

NGVAmerica supports EPA and NHTSA’s previous decision to use the 0.15 divisor to compute GHG and FE credits in MYs 2012 – 2015. We also support the proposal in this rulemaking to use UFs to compute GHG emissions (and eventually FE—see below) for dual-fuel vehicles. While the fuel economy program’s use of the 0.15 divisor are prescribed by federal law, the agencies apparently rely upon their general discretion to use the 0.15 factor to provide GHG credits for dual-fuel vehicles – and NGVAmerica supports that. [EPA-HQ-OAR-2010-0799-9461-A1, p. 9]

However, NGVAmerica wishes to point out several infirmities in the existing and proposed rules that undermine or eliminate the intended benefits of those rules. [EPA-HQ-OAR-2010-0799-9461-A1, p. 9]

First, in reality, the benefit of the FE credit is limited or non-existent since there currently are restrictions on the total amount of fuel economy credits manufacturers can use for dual fuel and flex-fuel vehicles. Federal law prescribes an upper bound on the maximum amount of fuel economy credit a manufacturer may earn and phases-out the credits after 2019 (although they are reinstated without a cap beginning 2020). Because of the significant number of E85 vehicles offered by manufacturers, it is expected that manufacturers will reach their fuel economy credit limit primarily via their E85 products. Any additional offerings of dual fuel NGVs will probably not earn the automakers any usable FE credits in MYs 2012–2015. There needs to be another avenue – not blocked by E85 vehicles – for manufacturers to take advantage of the FE credits generated by dual-fuel NGVs. [EPA-HQ-OAR-2010-0799-9461-A1, p. 9]

Second, it is true that manufacturers that offer dual-fuel NGVs will earn enhanced greenhouse gas emission credits for MY 2012--2015 vehicles, and the value of these GHG credits will be further improved by the use of the proposed utility factors. However, manufacturers are unlikely to find these GHG credits sufficiently attractive to produce dual-fuel NGVs (even if the credits can be carried forward for use in later years) unless they can simultaneously earn enhanced GHG and FE credits. [EPA-HQ-OAR-2010-0799-9461-A1, pp. 9-10]

It should be noted that, for 2012-2015, dedicated NGVs would continue to be of value to OEMs since they qualify for FE credits and there is no cap that limits the amount of the credits that manufacturers can use. (The 0.15 divisor also applies to dedicated vehicles' FE and GHG calculations.) While we certainly support the proposed incentives for dedicated vehicles, it is also important to provide useful and effective incentives for dual-fuel NGVs, too. Most consumers and even some fleets are likely to prefer dual-fuel vehicles over dedicated vehicles until the natural gas fueling infrastructure is significantly expanded. Dual-fuel vehicles will be a critical enabler to alleviate consumer concerns with range anxiety and will serve as an important vehicle option to help facilitate the transition to alternative fuel vehicles and spur consumer willingness to buy the types of vehicles that will be needed to comply with the new standards. [EPA-HQ-OAR-2010-0799-9461-A1, p. 10]

Regulatory Incentives for 2016 & Beyond

The incentives proposed for 2016 and beyond (as explained below) do not provide adequate or consistent incentives for NGVs (especially as compared to electric vehicles) and, therefore, are unlikely to be effective. [EPA-HQ-OAR-2010-0799-9461-A1, p. 10]

For dedicated NGVs, the proposed rules would continue to use the existing 0.15 FE divisor in 2016 and beyond (as required by law). However, for GHG calculations, after 2016, the 0.15

divisor would no longer be available, so GHG incentives for manufacturers would be negligible. [EPA-HQ-OAR-2010-0799-9461-A1, p. 10]

For dual fuel vehicles, the proposed rules would also continue to use the existing 0.15 divisor for FE in 2016 and beyond (as required by law). For FE purposes during 2016-2019, dual-fuel vehicles would be assumed to operate 50/50 on natural gas and petroleum. However, the need for FE credits, already limited by the cap and the production of E85 vehicles, would be further constrained by declining the cap. From 2020, the 50/50 rule would be replaced by the use of the UF. [EPA-HQ-OAR-2010-0799-9461-A1, p. 10]

For GHG emissions for dual-fuel vehicles, the use of the UF also would replace the use of the 50/50 rule from 2012 and thereafter. NGV America supports this. However, the use of the 0.15 divisor would end after 2015 – virtually eliminating the value of dual-fuel vehicle GHG benefits. If the purpose of these regulations is to encourage manufacturers to produce vehicles that produce fewer greenhouse gases, this aspect of the proposed rules makes little sense. As discussed above, NGVs produce less GHGs than comparable gasoline vehicles – especially when the upstream emissions are considered. Without continued use of the 0.15 divisor for dual-fuel GHG calculations, the incentive for manufacturers to produce NGVs would be significantly reduced. [EPA-HQ-OAR-2010-0799-9461-A1, p. 10]

NGV America's Recommended Changes

1. Provide a Separate Track for Dual-Fuel NGVs

As discussed above, the large number of E85 vehicles being manufactured, in effect, nullifies the value of other dual-fuel vehicle FE credits. NGVAmerica recommends that, in order to make the incentives for dual-fuel NGVs truly effective, the agencies should develop a separate track for these vehicles. Dual-fuel NGVs (and any other alternative fuel vehicles) certified under this track would earn unlimited (uncapped) FE and GHG credits. [EPA-HQ-OAR-2010-0799-9461-A1, p. 11]

2. Apply the Utility Factor for Dual-Fuel NGVs for Both GHG and FE Beginning in 2012

The utility factors should apply to dual-fuel vehicles beginning with MY 2012 for GHG and FE credits. The agencies have articulated sufficient legal justification for adopting the use of the utility factors for fuel economy for MY 2020 forward, and EPA has already proposed making the utility factors retroactive back to 2012 for GHG certification. This same rationale supports extending the utility factor to the FE calculations prior to 2020. EPA and NHTSA appear to understand that providing one credit but not the other is highly problematic and is not consistent with the intent of harmonization under one single national fuel economy/greenhouse gas program. That is why some credit provisions in the rules (e.g., FFVs, EVs, hybrid trucks) attempt to provide periods where both incentives overlap. Combining the incentives and providing consistent treatment of FE and GHG credits for dual-fuel NGVs is extremely important in ensuring compliance with these extremely complex regulations. [EPA-HQ-OAR-2010-0799-9461-A1, p. 11]

3. Continue the Use of the 0.15 GHG Divisor Beyond 2015

As discussed above, the use of the 0.15 divisor for GHGs for both dual-fuel and dedicated NGVs currently terminates after 2015. But these credits in order to be effective must be extended beyond 2015. Manufactures have already made preparations for MYs 2012-2015 and are unlikely to have sufficient time to respond to these incentives in that short timeframe. Therefore, to encourage more NGVs, EPA and NHTSA should extend the credits provided for NGVs until a certain market penetration is achieved. The phase-out of such incentives should be consistent with the approach taken with respect to electric drive vehicles. EPA and NHTSA have essentially proposed very generous treatment of such vehicles. Enhanced credits for such vehicles would only expire after these technologies reach a certain level of market penetration. We believe that providing these credits until a manufacturer's sale of NGVs reaches several hundred thousand (300,000 in the case of EVs) is warranted. Alternatively, EPA and NHTSA could establish one cap for all alternative fuel vehicles. [EPA-HQ-OAR-2010-0799-9461-A1, p. 11]

Other Credit Provisions

In addition to urging the agencies to adopt the incentive described above, we offer the following comments with respect to several other incentives proposed as part of this rulemaking:.

Sales Multipliers

In its notices, the agencies have asked for comment on whether to provide a production or sales multiplier for dedicated and dual-fuel NGVs. The agencies have proposed adopting such multipliers for other technologies (e.g., a multiplier of 1.3–2.0 is proposed for EVs, FCVs, and PHEVs) for 2017 – 2021. In order to ensure equitable treatment, the agencies should provide similar credits to NGVs. And since EVs and other electric-drive vehicles already receive extremely generous treatment in the rules, we believe that the provision of a sales multiplier for NGVs should be in addition to any other credits also provided for NGVs in order to further encourage manufacturers to offer such vehicles. In terms of credit values, we believe that dedicated NGVs should be treated like EVs and that dual-fuel NGVs should be treated like PHEVs. The result of this more equitable treatment would be to provide a level playing field to incentivize the manufacture of all alternative fuel vehicles and not favor one technology over another. Therefore, we propose the following multiplier credits for NGVs: [See table on p. 13 of Docket number EPA-HQ-OAR-2010-0799-9461-A1] [EPA-HQ-OAR-2010-0799-9461-A1, p. 12]

NGV America appreciates the opportunity to provide these comments. We applaud the agencies for the incentives that have been proposed for NGVs and other alternative fuel technologies. We urge the agencies to incorporate the changes we have proposed in our comments. The changes we have proposed will further stimulate the market for NGVs and other advanced technologies and provide significant economic, energy security and environmental benefits. We realize that this rulemaking is an enormously complicated and daunting undertaking and that EPA and NHTSA have a significant job ahead of them in terms of reviewing and evaluating the comments that have been submitted. We welcome the opportunity for additional dialogue and offer our assistance if necessary in understanding the proposals we have put forward in these comments. [EPA-HQ-OAR-2010-0799-9461-A1, p. 14]

1 See EIA, 2011 Annual Energy Outlook, Table 11 (April 2011).

2 “The Contributions of the Natural Gas Industry to the U.S. National and State Economies,” IHS Global Insight 2009, p.1.

3 National Research Council, “Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use.” Washington, DC: The National Academies Press, 2010.

4 See California Low Carbon Fuel Standard; http://www.arb.ca.gov/fuels/lcfs/121409lcfs_lutables.pdf.

5 Cannon, James S. “Gearing Up for Hydrogen: America’s Road to Sustainable Transportation.” Inform. 1998. http://www.informinc.org/gearinghydrogen.php

6 http://205.254.148.40/hydrogenandfuelcells/pdfs/h2_tech_roadmap.pdf

7 http://greet.es.anl.gov/results

8 http://205.254.148.40/hydrogenandfuelcells/pdfs/h2_tech_roadmap.pdf

9 Utility factors look at the driving range of vehicle on alternative fuel and assigns a utility factor for alternative fuel use (e.g., 70 miles on NG = 0.785 factor, 100 miles = 0.865, 150 miles = 0.925).

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 73.]

The NESCAUM states support EPA's proposal to calculate fuel economy for dedicated alternative fuel vehicles using only 15 percent of actual energy consumed as this provides a strong incentive for increased deployment of compressed national gas and fuel cell vehicles.

In the initial years of the standards, these vehicles will account for a very small fraction of overall sales and therefore own a small percentage of overall greenhouse gas emissions from the light-duty vehicle fleet.

Organization: Pennsylvania Department of Environmental Protection

Motor vehicles fueled by liquid petroleum remain a significant source of air emissions in Pennsylvania and this fact poses challenges to us in meeting and maintaining federal clean air standards. We are, however, seeing some promise from the dramatic increase in supplies and availability of domestic natural gas of swapping out our vehicle transportation fuel from imported foreign oil to domestic natural gas either directly or via electricity generated from domestic natural gas fuel. Indeed, this is the most significant opportunity we have had in our lifetime to clean our air, especially in urban areas where the burning of imported liquid transportation fuels is the most concentrated. This would dramatically improve the air quality of Pennsylvania and would, at the same time, significantly enhance our national security and energy independence to boot. We are encouraged by President Obama's statement made in January that natural gas could power America's long haul trucking fleet. Light-duty fleets could also benefit from the use of natural gas and we urge EPA to incorporate strategies in this regulation to promote natural gas light-duty vehicle development. [EPA-HQ-OAR-2010-0799-7821-A1, p. 1]

The Agencies Should Provide Similar Incentives to All Alternatively Fueled Vehicles.

We are concerned about the implications for provisions discussed below for encouraging the use of natural gas in light-duty vehicles. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Discard the Petroleum Equivalency Factor. The petroleum equivalency factor (PEF) should eventually be discarded in order that a fair and accurate accounting of GHG emissions be assessed among all vehicles so that the nation gets the most fuel efficient fleet possible. The agencies should work with Congress toward eliminating this statutory requirement. We recognize that the agencies are required by statute to count GHG emissions from electric vehicles (EV) using the PEF, which allows for only a partial counting of the actual GHG emissions produced by EVs. The PEF serves to incentivize manufacturers to produce more EVs. Discarding the PEF would level the incentive playing field among vehicles using different fuels, including natural gas, and allow for a more accurate accounting of GHG emissions. [EPA-HQ-OAR-2010-0799-7821-A1, pp. 3-4]

Organization: Plant Oil Powered Diesel Fuel Systems, Inc.

The Proposed Regulations assign to vehicles equipped to run on compressed natural gas ("CNG") a GHG emissions credit based on the amount of time the vehicle has been estimated by the Society of Automotive Engineers to run on CNG, as a function of the carbon emissions equivalency of this fuel as compared to petroleum. Id. [EPA-HQ-OAR-2010-0799-10337-A2, p. 6]

C. Natural Gas-Powered Vehicles

While natural gas produces less CO_2 per Btu than does coal or petroleum fuel oil, it entails the release into the atmosphere of fossilized carbon that constitutes a net addition to GHG's. EIA, "Natural Gas & the Environment," (Web: Feb. 3, 2012) (http://www.eia.gov/kids/energy.cfm?page=natural_gas_home-basics) (117 pounds versus 200 pounds versus 160 pounds, respectively). Proposed Regulations that encourage the use of a less-intensive GHG producing fossil fuel do not reduce GHG emissions going into the atmosphere; they only slow the pace of accumulation, still increasing Global Warming. Such incentives are, thus, contrary to the duty of EPA under the Clean Air Act to slow Global Warming. [EPA-HQ-OAR-2010-0799-10337-A2, p. 9]

Organization: Toyota Motor North America

ATV Multipliers [EPA-HQ-OAR-2010-0799-9586-A1, p.20]

EPA requests comment on extending to CNG vehicles a sales multiplier similar to those proposed for the advanced technology vehicles listed above. [EPA-HQ-OAR-2010-0799-9586-A1, p.20]

Toyota believes the primary consideration for including any technology in this provision should be its CO_2 reduction potential. The CAFE regulations already recognize the oil saving benefit of CNG vehicles by structuring the fuel economy calculations to provide a significant boost in their reported fuel economy. EPA's advanced technology provisions should be squarely focused on CO_2 benefits of a technology. [EPA-HQ-OAR-2010-0799-9586-A1, p.20]

Toyota opposes including CNG vehicles if it excludes other technologies that are more advanced and provide greater CO_2 reductions. While CNG vehicles typically emit about 20 percent less CO_2 compared to a convention gasoline engine, 'strong' gasoline electric hybrids typically emit 30 percent less. [EPA-HQ-OAR-2010-0799-9586-A1, p.20]

Toyota believes hybrid electric vehicles are a critical stepping-stone for the grid-connected technologies that are the focus of this proposed incentive. Hybrids share many of the same components as electric and plug-in hybrid vehicles (batteries, motors, and power electronics). Expanding hybrid vehicle penetration will help create economies of scale for these shared components while building manufacturing and supplier capabilities, ultimately supporting expansion of plug-in hybrid and electric vehicles. [EPA-HQ-OAR-2010-0799-9586-A1, p.20]

Therefore, if the agencies decide to grant CNG vehicles a multiplier under this proposed incentive, then hybrid vehicles should also be included and should be assigned a larger multiplier in recognition of their superior CO_2 reduction potential. Similarly, dual-fuel CNG systems should receive a lower multiplier than dedicated CNG systems based on expected real world CO_2 reductions. Finally, both the CNG and hybrid multipliers should be lower than those for plug-in hybrid electric vehicles. [EPA-HQ-OAR-2010-0799-9586-A1, p.20]

We also request the EPA revisit whether this provision should be continued beyond the 2021 model year as part of the mid-term review. [EPA-HQ-OAR-2010-0799-9586-A1, p.20]

Organization: Vehicle Production Group LLC (VPG)

Harmonization of Treatment of CNG Carbon Dioxide Emissions

Section 136 of the Energy Independence and Security Act of 2007 creates a government-backed loan program for the development of non-petroleum fuels for automotive applications. The Department of Energy administers this loan program through private banks. VPG was awarded a loan of approximately $50 million through this program for the development of our CNG offering. Among the benefits to OEM's responsible for compliance with CAFE regulations, and as a function of displacing the nation's dependence on foreign oil, there is a credit for the determination of the fuel economy of a dedicated CNG vehicle. [EPA-HQ-OAR-2010-0799-7985-A2, p. 3]

Congress has identified CNG for automotive fuel applications as strategically important to the extent that the above mentioned CAFE computation credit is granted, and government backed loans are offered for the development of CNG fueled vehicles; yet the carbon dioxide emissions from CNG fueled vehicles are handled in the same manner as CO_2 emissions from petroleum sources. Carbon dioxide emissions generated by VPG's gasoline and CNG vehicles as measured by the federal city and highway tests are detailed in Table 1. [See Table 1 on page 3 of Docket number EPA-HQ-OAR-2010-0799-7985-A2] [EPA-HQ-OAR-2010-0799-7985-A2, p. 3]

Since CO_2 emissions are essentially equivalent to fuel economy, and fuel economy of dedicated CNG fueled vehicles is adjusted to create a benefit for the CAFE calculation, VPG suggests the application of the same beneficial treatment of CO_2 generated from CNG as is given to fuel economy. The proposal forwarded by VPG shown in table 1 is an adjustment factor, consistent with the factor applied to fuel economy of dedicated CNG fueled vehicles in calculating CAFE. The adjustment is the use of a 0.15 factor applied to natural gas generated carbon dioxide emissions. [EPA-HQ-OAR-2010-0799-7985-A2, p. 3]

Organization: VNG Co. (VNG)

Section 1: Appropriate. Fair. and Consistent Incentives Are Needed for NGVs. [EPA-HQ-OAR-2010-0799-7941-A2, p. 1]

The success of VNG (and other fueling infrastructure providers) will thus be critical to achieving the Agencies' long-term environmental and energy security goals. However, the massive capital investments that will be required to build this infrastructure are dependent on automakers bringing substantial quantities of NGVs to market - and these production decisions are strongly influenced by the fuel economy and greenhouse gas ('GHG') regulations that are the subject of the present NPRM. [EPA-HQ-OAR-2010-0799-7941-A2, p. 2]

The Notice of Proposed Rulemaking ('NPRM') acknowledges the emissions and energy security benefits of NGVs and takes steps to support their production in ways that the Agencies do not in the current rules. As explained in more detail below, the NPRM includes several proposals that will benefit NGVs, including-

• Utility factors to determine natural gas fuel use for dual-fuel NGVs;

• Credits for deployment of 'game-changing' technologies for full-size pickups, potentially including NGV capability;

• Option to use new EPA rules for dual-fuel NGVs beginning in 2012; and,

• NHTSA's proposal for a strong regime for measuring fuel economy for dual-fuel NGVs after the expiration of statutory credits in 2019. [EPA-HQ-OAR-2010-0799-7941-A2, p. 2]

Despite these positive proposals, and despite the Agencies' desire 'to remain scrupulously neutral... to avoid picking technology 'winners',' electric vehicles ('EVs') receive far more consideration and incentives than NGVs under the NPRM. In order for the Agencies to facilitate the 'all out, all of the above' energy strategy advocated by the President in his recent State of the Union address,4 NGVs must also be provided with appropriate regulatory incentives relative to their unique benefits and contributions to near- and long-term emissions and energy security goals. Additional steps are required to establish appropriate, fair, and consistent incentives for NGVs:

• Multipliers for NGVs similar to those offered for PHEVs, EVs, and FCEVs;

• An extension of the current calculation of NGV GRG emissions as 0.15 times those of gasoline emissions (equivalent to CAFE credits), for a similar duration as the 0 g/mile emissions incentive for EVs; and,

• Appropriate fuel economy credits for dual-fuel NGVs between 2012 and 2019. [EPA-HQ-OAR-2010-0799-7941-A2, p. 2]

The long-term energy security, environmental, and technology innovation goals of the Agencies will have the greatest chance for success if the current NPRM establishes appropriate, fair, and consistent incentives for all alternative fuel vehicles, including NGVs, and refrains from picking 'winners.' Development of the NGV market is particularly important to the achievement of these goals because it serves two purposes: 1) NGVs are an essential technology to reduce emissions and replace petroleum consumption from ICE vehicles in the near term; and, 2) NGVs create a bridge to FCEV market development in the longer term. VNG urges the Agencies to consider their proposed rules and the following VNG comments in the context of this broader vision. [EPA-HQ-OAR-2010-0799-7941-A2, pp. 2-3]

Section 2: NGVs Will Benefit from New Economics of Natural Gas - But Require Appropriate Regulations to Meet Their Potential

The adoption of NGVs in the US will be driven by two core factors: consumer demand due to the new economics of natural gas in the US; and, regulations that recognize the ability of natural gas to address national environmental and energy security goals in both the near and long term. [EPA-HQ-OAR-2010-0799-7941-A2, p. 3]

The New Economics of US Gas: VNG - and increasingly, automakers - are optimistic about the future of NGVs in the United States due to the shale gas 'revolution.' The combination of established hydraulic fracturing techniques and new horizontal drilling technologies has been termed 'the biggest energy innovation of the decade' by energy expert Daniel Yergin for allowing drillers to economically access vast amounts of previously-untapped supplies of natural gas stored in shale rock formations.5 President Obama emphasized the importance of this new natural gas production for achieving US energy independence and environmental goals in his recent State of the Union, lauding a 'a supply of natural gas that can last America nearly 100 years."6 [EPA-HQ-OAR-2010-0799-7941-A2, p. 3]

This flood of new domestic natural gas has resulted in a surplus in the market and low prices, which are expected to remain much lower and more stable than oil for decades to come. Compressed natural gas (CNG) currently costs about $1.50 less per gasoline gallon equivalent (GGE) compared to gasoline,7 and according to forecasts from the Energy Information Administration (EIA), this pricing advantage is expected to grow to over $2 per GGE by 2020, and $3 per GGE by 2035.8 [EPA-HQ-OAR-2010-0799-7941-A2, p. 3]

This durable price advantage has the potential to drive widespread consumer adoption of NGVs, which automakers expect can be produced at an incremental cost of $3,000 or less.9 Presenting consumers with this favorable price-value proposition will require automakers to move from current small-volume, conversion kit production of NGVs to mass-produced, production line vehicles - a move that has been key to gaining market success in Europe. Before making necessary investments in mass-market NGV production, automakers will require assurance of fueling infrastructure availability and a regulatory framework that provides appropriate, fair and consistent incentives for NGVs. [EPA-HQ-OAR-2010-0799-7941-A2, p. 3]

Contributes to Energy Security and Environmental Goals: Natural gas is a 100 percent North American fuel that can directly replace imported oil in the transportation sector, in line with the energy security goals of the current rulemaking. Natural gas is also much cleaner burning than gasoline, making it well-suited to meet the environmental goals of the NPRM as well. Argonne National Laboratory's GREET model estimates that NGVs reduce GHG emissions by 24 percent compared to gasoline when fueled on conventional natural gas, and GHG emissions can be close to zero on a lifecycle basis when natural gas is sourced from landfills or other renewable, biogenic sources.10 [EPA-HQ-OAR-2010-0799-7941-A2, p. 4]

These benefits from natural gas operation will be in addition to the efficiency-related fuel economy improvements and emissions reductions achieved in the conventional gasoline-fueled vehicle fleet, since NGVs use the same ICEs. The added reductions in ICE petroleum use and emissions offered by natural gas operation will be valuable to automakers as they seek to comply with increasingly stringent future regulations. Although the US vehicle fleet may one day include large numbers of EVs and FCEVs, the vast majority of sales will be ICE vehicles for the foreseeable future, making it critical to ensure the viability of the natural gas compliance pathway for automakers. [EPA-HQ-OAR-2010-0799-7941-A2, p. 4]

Contributes to Other Regulations: NGV production and the development of natural gas refueling infrastructure can also facilitate compliance with other vehicle regulations. NGVs are well-suited to meet the Tier 3 emission standards under development by EPA due to low emissions for all criteria pollutants, and renewable biomethane can satisfy the advanced biofuels requirement of the EPA-administered Renewable Fuel Standard due to deep lifecycle emission reductions and use of non-food feedstocks.14 In California, NGVs qualify as an Advanced Technology Partial Zero Emission Vehicle under the Zero Emission Vehicle standard, 15 and CNG has one of the lowest carbon intensities of any fuel under the proposed Low Carbon Fuel Standard.16 [EPA-HQ-OAR-2010-0799-7941-A2, pp. 4-5]

Essential Bridge to Hydrogen: In the long term, NGVs will serve as an essential 'bridge' technology to FCEVs, which the Agencies recognize as one of the key technology pathways for achieving long-term energy and environmental goals. FCEVs and EVs can 'transform' the light-duty vehicle sector, but they face major market barriers including 'vehicle cost, fuel cost, the development oflow-GHG fuel production and distribution infrastructure, and/or consumer acceptance.' [EPA-HQ-OAR-2010-0799-7941-A2, p. 5]

The production of NGVs and development of natural gas refueling infrastructure directly address all ofthe 'major near-term market barriers' the Agencies identify for FCEVs. This critical context for understanding the importance of NGVs in achieving the country's long-term energy and environmental goals is summarized in Section 4, within a discussion of the advanced vehicle technology multipliers proposed in this NPRM. The role of NGVs as a 'bridge to hydrogen' is presented in much greater detail in the attached white paper entitled NATURAL GAS: An Essential Bridge To Hydrogen Fuel Cell Vehicles by clean transportation expert James Cannon. [The white paper can be found on pp. 19-35 of Docket number EPA-HQ-OAR-2010-0799-7941-A2] [EPA-HQ-OAR-2010-0799-7941-A2, p. 5]

• New rules for estimating the natural gas fuel use of dual-fuel NGVs developed by the Society of Automotive Engineers (SAE) - the 'utility factor' approach - will allow automakers to receive credit for the greater potential for alternative fuel use of NGV vehicles compared to dual-fuel ethanol (i.e., 'flex-fuel') vehicles; [EPA-HQ-OAR-2010-0799-7941-A2, p. 5]

• The option for automakers to use new EPA rules for dual-fuel NGVs beginning in 2012, which will allow these vehicles to be eligible for uncapped credits based on the utility factor methodology immediately instead of waiting until 2017; [EPA-HQ-OAR-2010-0799-7941-A2, p. 5]

• NHTSA's proposal for a strong regime for measuring fuel economy for dual-fuel NGVs after the expiration of statutory credits in 2019 - which represents an improvement over the current rules, since the removal of statutory caps will allow these vehicles to actually receive credits; [EPA-HQ-OAR-2010-0799-7941-A2, p. 6]

Utility Factors

In the same manner that PHEVs assuage EV owners' 'range anxiety' concerns, dual-fuel NGVs ameliorate 'range anxiety' that might discourage consumers from purchasing dedicated NGVs during the early years of natural gas refueling infrastructure build out. VNG therefore applauds and fully supports the use of the SAE 'utility factor' methodology to determine expected fuel use for both PHEV and dual-fuel NGVs. [EPA-HQ-OAR-2010-0799-7941-A2, p. 6]

The utility factors are a substantial improvement over the previous formula, which assumed that dual-fuel vehicles would only use natural gas for half of vehicle miles traveled. Instead, utility factors provide a more accurate calculation of usage because they compare the range of each specific natural gas vehicle to the daily travel needs of the average driver, resulting in a higher percentage of assumed natural gas fuel use for dual fuel vehicles with significant natural gas range. [EPA-HQ-OAR-2010-0799-7941-A2, p. 6]

VNG strongly supports the use of utility factors for dual-fueled NGVs for four reasons:

• Given the higher purchase price of an NGV and much lower fuel costs for natural gas compared to gasoline, drivers will fuel on natural gas as often as possible; [EPA-HQ-OAR-2010-0799-7941-A2, p. 6]

• The new economics of natural gas will support the build-out of a national, public NGV refueling infrastructure by VNG (and our competitors), giving dual-fuel NGV drivers widespread access to natural gas fuel; [EPA-HQ-OAR-2010-0799-7941-A2, p. 6]

• There is significant potential for overnight home natural gas refueling for NGVs, although the Agencies only acknowledge the potential for home charging for PHEVs in the NPRM. The combination of overnight horne refueling and fast 'on-the-go' fueling at public stations could ensure that the vast majority of daily travel for dual-fuel NGVs is fueled by natural gas; and, [EPA-HQ-OAR-2010-0799-7941-A2, p. 6]

• Adopting the utility factor approach is an important step towards correcting the current, statutorily-imposed rules that unfairly treat dual-fuel NGVs in the same fashion as E85 flex-fuel vehicles, despite the vastly greater potential for dual-fuel NGVs to make a significant impact on real-world petroleum consumption and GHG emissions. Treating dual-fuel NGVs similarly to PHEVs rather than FFVs is an important precedent that is also appropriate in the context of NGV multipliers, as discussed below. [EPA-HQ-OAR-2010-0799-7941-A2, p. 7]

Finally, in the event that the utility factors prove to be unrepresentative of real-world natural gas fuel use, the SAE and the Agencies will have an opportunity to adjust them appropriately during the midterm review period. [EPA-HQ-OAR-2010-0799-7941-A2, p. 7]

While VNG's business interest is for dual-fuel NGVs to fuel on natural gas as often as possible, we do not support the imposition of design requirements for dual-fuel vehicles based on tank size or other factors, a possibility the Agencies requested comments on in the NPRM. The utility factor approach itself incentivizes automakers to build vehicles with greater CNG range, since fuel economy and emissions calculations improve with tank size. However, specific range or design requirements would restrict the ability of automakers to design vehicles based on consumer preference - a particularly important concern in the early years of developing market acceptance of a new technology. [EPA-HQ-OAR-2010-0799-7941-A2, p. 7]

Consistent EPA Regime for Dual-Fuel Vehicles

EPA has proposed allowing automakers the option of moving immediately to the new regime for dual-fuel NGVs beginning in 2012, with no cap on emission credits, no CNG range minimum, and with utility factors to determine fuel use instead of the 50 percent natural gas fueling assumption. VNG strongly supports this proposal, as it will end discrimination against dual-fuel NGVs under the current rules, as discussed below. [EPA-HQ-OAR-2010-0799-7941-A2, p. 8]

In the prior rulemaking for light duty vehicles, EPA adopted the structure of dual-fuel vehicle incentives prescribed for NHTSA in the Energy Policy and Conservation Act ('EPCA') and

Energy Independence and Security Act ('EISA'), which assumed 50 percent alternative fuel use for dual-fueled vehicles and capped the total benefits to a given automaker's overall fuel economy calculation from all dual-fuel vehicles including dual-fuel NGVs and E85 'flex fuel' vehicles - at 1.2 mpg, declining to 0 in 2019. Because virtually all automakers have opted to produce a sufficient quantity of E85 flex-fuel vehicles to reach the maximum allowed credit,31 dual-fuel NGVs are effectively blocked from receiving their Congressionally authorized incentives. [EPA-HQ-OAR-2010-0799-7941-A2, p. 8]

Moreover, the statutory definition of dual-fuel NGVs within EPCA is unnecessarily restrictive. Dual-fuel NGVs are required to have a CNG-only range of at least 200 miles to qualify for the CAFE credit - a requirement equivalent to a 95.4% natural gas usage rate according to the utility factor methodology. This effectively results in vehicles expected to fuel on natural gas a large majority of the time - a vehicle with a IDO-mile CNG range is expected to fuel on CNG for 86.5% of total miles, for example - being treated as dedicated gasoline vehicles. The Agencies have implicitly acknowledged that this treatment of dual-fuel NGVs is unnecessary in this NPRM, as both EPA and NHTSA have opted not to adopt minimum range criteria except when required by EPCA. [EPA-HQ-OAR-2010-0799-7941-A2, pp. 8-9]

The Agencies' proposal to allow automakers to take advantage of the new EPA rules in 2012 is an important first step towards accelerating the production of dual-fuel NGVs, since NGVs can be added to automaker production plans with relatively short lead times and a low incremental cost (if automakers move from small-volume conversions to high-volume production line vehicles). As a result, NGVs can and should be encouraged to make a positive impact on energy security and environmental goals as soon as possible, during the 2012-2016 period. In fact, dual-fuel NGVs will have their greatest value during the early years of the build out of the natural gas refueling infrastructure due to their ability to eliminate range anxiety. [EPA-HQ-OAR-2010-0799-7941-A2, p. 9]

It should be noted, however, that this productive proposal by EPA is an incomplete solution to the unfairness of the current rules for dual-fuel NGVs. Until NHTSA's rules are revised to provide appropriate, fair, and consistent incentives for dual-fuel NGVs in 2012-2019 and beyond, these vehicles will continue to underachieve their potential and underserve the Agencies' objectives. In Section 4, below, VNG discusses ways in which NHTSA might make its rules more consistent with EPA's proposal. [EPA-HQ-OAR-2010-0799-7941-A2, p. 9]

Strong Post-2019 NHTSA Regime for Dual-Fuel NGVs

VNG strongly supports NHTSA's proposal for the treatment of dual-fuel NGVs after 2019. As the Agencies recognize, without credits for dual-fuel NGVs, automakers might only produce dedicated NGVs due to their ongoing regulatory incentives. This in turn could limit development of the market for NGVs, since many consumers may prefer a dual-fuel NGV as their first natural gas vehicle to eliminate 'range anxiety,' just as many consumers today may prefer PHEVs to dedicated EVs due to similar range and recharging concerns. NHTSA should thus continue using the Petroleum Equivalency Factor to calculate the fuel economy of dual-fuel NGVs, as with dedicated NGVs. [EPA-HQ-OAR-2010-0799-7941-A2, p. 9]

The use of utility factors to determine fuel usage and removing the previous statutory caps is also appropriate in the post-2019 period, given expectations for maximum possible natural gas fuel use by dual-fuel NGVs. Statutory minimums for CNG range for dual-fuel NGVs are also appropriately removed, in light of higher expected natural gas fuel use under the utility factor methodology as well as the structure of the utility factors, which give automakers greater incentives for vehicles with greater CNG ranges. These proposals are also consistent with the proposed treatment of dual-fuel NGVs under EPA rules, which will take effect beginning in 2012 under the NPRM. [EPA-HQ-OAR-2010-0799-7941-A2, pp. 9-10]

As discussed above, while the post-2020 regime for dual-fuel NGVs is excellent, the effectiveness of this post-2020 regime is severely curtailed by the fact that these vehicles are effectively blocked from receiving any incentives through 2019. [EPA-HQ-OAR-2010-0799-7941-A2, p. 10]

Section 4: Additional Steps Are Needed for Appropriate. Fair and Consistent NGV Incentives

Although the proposed rules provide increased incentives for NGVs, the overall regulatory regime for NGVs is substantially less favorable than the regime for PHEVs and EVs, particularly with regard to the EPA rules. Under proposed EPA rules, EVs will receive a 'double incentive' that includes both a 0 g/mi GHG incentive and multipliers that magnify the impact of each EV on a manufacturer's GHG compliance scores. NGVs do not receive comparable incentives in the NPRM, although notably the Agencies do request comments on NGV multipliers in the NPRM preamble. [EPA-HQ-OAR-2010-0799-7941-A2, p. 10]

The regulatory regime for NGVs is also fraught with inconsistency under both EPA and NHTSA rules. For example, EPA incentives are strong through 2015 but disappear in 2016, in contrast to the consistent 0 g/mi GHG incentive for EVs, which is retained through 2025 (although phased out for automakers producing large numbers of these vehicles starting in 2021). NHTSA incentives for dual-fuel NGVs are rendered effectively useless by statutory limits until 2020, after which time they become favorable. [EPA-HQ-OAR-2010-0799-7941-A2, pp. 10-11]

Without consistent incentives for NGVs, automakers will be less inclined to make investments in these vehicles since they will find it difficult to fit the benefits of these vehicles into their long-term compliance strategies. The Agencies' treatment of NGVs also stands in stark contrast to the consistent, long-term, favorable treatment given to EVs as well as the Agencies' goal of not 'picking technology winners.'38 The importance of establishing appropriate and consistent rules that allow all alternative fuels a fair chance to contribute to energy security and environmental goals is magnified by the particularly long duration of this rulemaking period compared to previous rulemakings. [EPA-HQ-OAR-2010-0799-7941-A2, p. 11]

VNG has several recommendations for providing more appropriate incentives for NGVs, which will ensure that consumers have a wide selection of low-emission alternative fuel vehicles and that the greatest number of such vehicles are produced and sold:

• Multipliers for dual-fuel NGVs on par with multipliers for PHEVs, and multipliers for dedicated NGVs equal to those for EVs;

• An extension of the current calculation of NGV GHG emissions as 0.15 times those of gasoline emissions (equivalent to CAFE credits), for a similar duration as the 0 g/mile emissions incentive for EVs. Measured emissions levels would similarly be phased in after 2022 on the same schedule that EV emissions begin to be measured according to their upstream emissions; and,

• Appropriate fuel economy credits for dual-fuel NGVs between 2012 and 2019. Dual-fuel NGVs expected to fuel predominantly on natural gas are effectively denied incentives under current statutory rules and treated like gasoline vehicles, which the Agencies acknowledge is an 'absurd result.' We encourage the Agencies to explore whether it is possible to provide appropriate fuel economy credits to these vehicles as soon as possible. [EPA-HQ-OAR-2010-0799-7941-A2, p. 11]

Multipliers for NGVs

EPA requested comments on 'the merits of providing similar multiplier incentives to dedicated and/or dual-fuel compressed natural §as vehicles' as those proposed for EVs, PHEVs, and FCEVs under the GHG program.3 These multipliers allow automakers to count each low-or-zero emission vehicle as more than one vehicle for the purposes of compliance calculations between 2017 and 2021, with the express purpose of facilitating market penetration of advanced technology vehicles.40 While EVs and FCEVs are expected to play crucial roles in achieving national energy and environmental goals in the long term, the multipliers are considered necessary in the NPRM to help surmount significant near-term market barriers they face, including: 'vehicle cost, fuel cost (in the case of fuel cell vehicles), the development of low-GHG fuel production and distribution infrastructure, and/or consumer acceptance." [EPA-HQ-OAR-2010-0799-7941-A2, pp. 11-12]

Both dedicated and dual-fuel NGVs should be eligible for similar multipliers as PHEVs and EVs. California already recognizes NGVs as an 'advanced technology' vehicle in its Zero Emission Vehicle (ZEV) regulation, as noted earlier in these comments. NGVs also contribute directly to the Agencies' own advanced technology goals, due to their essential role in facilitating the market penetration of FCEVs. Since the first wave of NGV adoption in the 1990s, the development of NGVs - and particularly natural gas refueling infrastructure - has long been recognized as a key bridge to hydrogen FCEVS.42 [EPA-HQ-OAR-2010-0799-7941-A2, p. 12]

Natural gas is largely composed of hydrogen, with four hydrogen atoms for every carbon atom in a molecule of methane. Due to the chemical and physical similarities of these two gases, they share a number of technology synergies, so that the proliferation of NGVs and natural gas fueling infrastructure will facilitate and accelerate deployment of FCEVs. Indeed, the development of the NGV market serves to reduce or eliminate all four of the near-term market barriers to FCEV adoption identified by the Agencies: [EPA-HQ-OAR-2010-0799-7941-A2, p. 12]

• Low-GHG Fuel Production and Distribution Infrastructure: NGV refueling infrastructure utilizes most of the same hardware (compressors, storage tanks, dispensers) that will be used to dispense hydrogen fuel, allowing natural gas refueling stations to be straightforwardly adapted for hydrogen dispensing. Natural gas can also be used as a feedstock for hydrogen fuel production via distributed steam reforming at the refueling station, a fuel production pathway identified by the Department of Energy's FreedomCAR & Fuel Partnership as the 'most viable approach to begin building [the] hydrogen market in near term.'43 Distributed steam reforming of natural gas for hydrogen production also yields just half of the lifecycle GHGs as production of hydrogen via electrolysis usin1 grid electricity, according to Argonne National Laboratories' GREET model.44 [EPA-HQ-OAR-2010-0799-7941-A2, p. 12]

• Fuel Cost: Production of hydrogen from natural gas via distributed steam reformers also represents the 'lowest current cost' hydrogen pathway compared to electrolysis and other methods, according to the FreedomCAR roadmap.45 [EPA-HQ-OAR-2010-0799-7941-A2, p. 12]

• Vehicle Cost: NGV development will help reduce FCEV vehicle costs by advancing on-board gaseous storage and fuel management technologies, allowing more fuel to be stored safely with less weight and/or space. In a sense the FCEV represents the ultimate union of NGVs and EVs, with EVs providing the electric drivetrain and NGVs ensuring the development of hydrogen fuel technologies. [EPA-HQ-OAR-2010-0799-7941-A2, p. 12]

• Consumer Acceptance: By increasing familiarity and comfort with gaseous fuel vehicles and refueling, NGVs will help pave the way for consumer acceptance of FCEVs. NGV deployment will also serve the role of developing experience with gaseous fuel vehicles for auto dealers, mechanics, and other important stakeholders that directly interface with consumers. [EPA-HQ-OAR-2010-0799-7941-A2, p. 13]

Attached to these Comments is a white paper NATURAL GAS: An Essential Bridge To Hydrogen Fuel Cell Vehicles authored by clean vehicle technology expert James Cannon, which provides detailed background on the synergies between NGVs and FCEVs in a number of key areas, including hydrogen production, distribution, storage, and fuel management systems, fuel dispensing, natural gas-hydrogen fuel blends, vehicle technologies, and safety standards and training. [The white paper can be found on pp. 19-35 of Docket number EPA-HQ-OAR-2010-0799-7941-A2] [EPA-HQ-OAR-2010-0799-7941-A2, p. 13]

In short, the market penetration of NGVs helps ensure that the necessary fuel and technologies will be in place for FCEVs, accelerating and lowering the costs of this transition. Much like the role that PHEVs play in facilitating adoption of EVs, NGVs and particularly dual-fuel NGVs, which mitigate 'range anxiety' for early adopters - are essential for facilitating the market penetration of FCEVs. [EPA-HQ-OAR-2010-0799-7941-A2, p. 13]

Thus, allowing dual-fuel NGVs to receive the same EPA multipliers as PHEVs - with every NGV counting as 1.6 vehicles in 2017, then declining to 1.3 vehicles in 2021 would help build a similar 'bridge' to the hydrogen future that PHEVs provide for EVs. Dedicated NGVs should be eligible for a multiplier level equivalent to EVs and FCEVs, of 2.0x in 2017, declining to 1.5x in 2021. [EPA-HQ-OAR-2010-0799-7941-A2, p. 13]

Our proposed multiplier values assume that the Agencies will also extend GHO incentives for NGVs in parallel with their proposed extension of the 0 g/mi GHG incentive for EVs, as we propose below - in effect, duplicating the 'double incentive' structure given to EVs. However, if the GHG incentive for NGVs is not extended, we would propose doubling all the proposed multipliers for NGVs and FCEVs in order to balance the EV 'double incentive' (in effect, a 'doubled single incentive' for NGVs). [EPA-HQ-OAR-2010-0799-7941-A2, p. 13]

Extended GHG Incentive for NGVs

Under the current rules, EPA will begin to count the emissions of vehicles operating on natural gas at their tailpipe value in 2016. While this value will recognize the real-world emission reductions of approximately 24 percent that natural gas provides compared to gasoline, it ends an emission incentive previously given to NGVs. Until 2016, EPA will count natural gas emissions as just 0.15 times the level of gasoline emissions, equivalent to the 'CAFE credit' approach of NHTSA's Petroleum Equivalency Factor. [EPA-HQ-OAR-2010-0799-7941-A2, p. 13]

Termination of the natural gas emissions incentive is premature - and disadvantages NGVs relative to EVs. The Agencies allowed automakers to count EVs and the electric portion of PHEVs as having emissions of 0 g/mi in the 2012-2016 rulemaking, and in this NPRM they propose extending this treatment to 2025. This incentive is given despite the Agencies' acknowledgement that the use of electric vehicles generates significant upstream emissions from power generation: [EPA-HQ-OAR-2010-0799-7941-A2, pp. 13-14]

'Because [EV] upstream emissions values are generally higher than the upstream GHG emissions values associated with gasoline vehicles, and because there is currently no national program in place to reduce GHG emissions from electric powerplants, EPA believes it is appropriate to consider the incremental upstream GHG emissions associated with electricity production and distribution.' [EPA-HQ-OAR-2010-0799-7941-A2, p. 14]

While the Agencies intend to eventually calculate EV emissions according to a formula that accounts for upstream GHGs, these values will not be phased in until the 2022-2025 period, and even then only for automakers that produce more than a specified number of vehicles. VNG does not object to this treatment of EVs: we recognize that incentives are needed to encourage automakers to take on the risks required to introduce new vehicle technologies. We simply believe that NGVs deserve similar treatment so that automakers will be given fair incentives and rewards for all clean alternative fuel technologies, instead of facing a regulatory landscape tilted towards one pathway. [EPA-HQ-OAR-2010-0799-7941-A2, p. 14]

Additionally, EPA's treatment of natural gas results in markedly inconsistent incentives between the Agencies. Under NHTSA's program, the fuel economy of natural gas will continue to be counted as 0.15 times the gasoline-equivalent fuel economy of the vehicle throughout the 2017-2025 program (although, as discussed below, dual-fuel NGVs may be limited in their ability to receive this incentive until 2020). The move away from the harmonized EPA/NHTSA incentive to a much lower incentive under the EPA program starting in 2016 will complicate and potentially limit the ability of automakers to incorporate NGVs into their compliance strategies. [EPA-HQ-OAR-2010-0799-7941-A2, p. 14]

In order to provide appropriate and fair treatment for NGVs under the EPA program, as well as maintain harmonized, consistent rules for automakers between the two Agencies for a longer period of time, the Agencies should extend the current GHG incentive for natural gas through 2025 under the same rules as the GHG incentive for EVs. This would entail continuing to count natural gas emissions as 0.15 times the level of gasoline emissions for all NGVs through 2021, and then phasing in the tailpipe emission level (e.g., -24 percent below gasoline) between 2022 and 2025 solely for manufacturers producing over 200,000 vehicles cumulatively over this period (or 600,000 vehicles for manufacturers producing over 300,000 vehicles cumulatively from 2017-2021). This is in keeping with the principle of fair, qualitatively similar incentives for both electric and gaseous-fueled vehicles while maintaining quantitatively differentiated incentives based on the characteristics of the technologies. [EPA-HQ-OAR-2010-0799-7941-A2, p. 14]

Appropriate NHTSA Credits for Dual-Fuel NGVs Between 2012 and 2019 [EPA-HQ-OAR-2010-0799-7941-A2, p. 14]

Due to their ability to alleviate 'range anxiety' for drivers, dual-fuel NGVs are a key transition technology for both dedicated NGVs as well as hydrogen FCEVs, in the same way that PHEVs are a key transition technology for dedicated EVs. VNG strongly supports all of the steps proposed by the Agencies to provide support for dual-fuel NGVs, and particularly the utility factor methodology for calculating dual-fuel NGV fuel use noted in Section 3. [EPA-HQ-OAR-2010-0799-7941-A2, p. 15]

However, there remains a major gap in the rules for dual-fuel NGVs due to the constraints of EPCA and EISA, which effectively prevent dual-fuel NGVs from receiving fuel economy credits for natural gas operation under the statutory program until 2020. The current NHTSA rules restrict dual-fuel NGV access to credits in two ways: [EPA-HQ-OAR-2010-0799-7941-A2, p. 15]

• Shared Cap With Ethanol Dual-Fuel Vehicles: Dual-fuel NGVs are grouped with dual-fuel E85 vehicles (also known as 'flex-fuel' vehicles) and placed under a cap that limits their combined statutory credits for automaker fuel economy calculations. Because dual-fuel E85 vehicles can be produced with minimal incremental cost, virtually all automakers have opted to produce enough of these vehicles to reach the maximum benefit allowed by statute, leaving no room under the cap left for dual-fuel NGVs. [EPA-HQ-OAR-2010-0799-7941-A2, p. 15]

• Excessively High Minimum CNG Range: Under the statute (49 USC 32901), in order to qualify as a 'dual fueled automobile' the vehicle must meet a prescribed minimum driving range of200 miles when driving on alternative fuel. Consequently, dual-fuel NGVs are required to have a CNG range of at least 200 miles to qualify for the statutory CAFE credit - a requirement equivalent to a 95.4% natural gas usage rate according to the utility factor methodology. No statutory credits are given for vehicles with less than a 200 mile CNG range, despite the fact that many of these vehicles would be expected to fuel on CNG the large majority of the time under the utility factor methodology. [EPA-HQ-OAR-2010-0799-7941-A2, p. 15]

Taken together, these restrictions will result in dual-fuel NGVs predominantly fueled on natural gas being treated as gasoline vehicles under NHTSA rules until the statutory credit program expires in 2019. This is unfair and counterproductive. Indeed, the Agencies recognize that this is an 'absurd result' in their rationale for providing dual-fuel NGVs with full access to the new utility factor-based rules starting in 2020:

'NHTSA and EPA believe that the expiration of the dual-fueled vehicle measurement methodology in the statute leaves a gap to be filled, to avoid the absurd result of dual-fueled vehicles' fuel economy being measured like that of conventional gasoline vehicles. If the overarching purpose of the statute is energy conservation and reducing petroleum usage, the agencies believe that that goal is best met by continuing to reflect through CAFE calculations the reduced petroleum usage that dual fueled vehicles achieve.” [EPA-HQ-OAR-2010-0799-7941-A2, p. 15]

Treating vehicles that will fuel predominantly on natural gas as gasoline vehicles is indeed an 'absurd' result that runs contrary to the purpose of the statute, and as noted in Section 3 we strongly support the steps taken by EPA and NHTSA to bridge this 'gap' fairly for the 2020-2025 period. However, because of the significant potential of dual-fuel NGVs to make an impact on petroleum reduction goals in the near term, it is also important and appropriate for the Agencies to attempt to address the gap in the 20122019 period to the extent possible. [EPA-HQ-OAR-2010-0799-7941-A2, p. 16]

For example, VNG believes that it may be possible for the Agencies to address the second barrier within the context of this rulemaking. The Agencies have implicitly acknowledged that this very high minimum range for dual-fuel NGVs is unnecessary in this NPRM, as EPA has not adopted a range minimum in its rules, and NHTSA has proposed discarding the range minimum beginning in 2020, after the expiration of the statutory dual-fuel regime.5 While NHTSA has previously determined that it lacked discretion to set a lower range for dual-fuel vehicles,52 the Agencies should consider whether it is possible to establish a new category of vehicle with less than a 200 mile range on an alternate fuel- not a 'dual-fueled' automobile as defined in the statutes, but not a dedicated gasoline automobile either - which can earn appropriate fuel economy credits throughout the period to be governed by the regulations.53 [EPA-HQ-OAR-2010-0799-7941-A2, p. 16]

Alternatively, the Agencies could explore the extent to which it could allow automakers to 'bank' credits that would otherwise be awarded to dual-fueled NGVs in the absence of the statutory limitations during the 2012-2019 period for use in 2020 and beyond.

VNG is fully cognizant of the challenges presented by these or other approaches, but nevertheless encourages the Agencies to explore all options for providing appropriate fuel economy incentives for dual-fuel NGVs prior to 2020. Even a partial solution would be a significant incentive for automakers to begin producing dual-fuel NGVs in the near term, and would harmonize NHTSA's rules with EPA's to the greatest extent possible for the 2012-2019 period. [EPA-HQ-OAR-2010-0799-7941-A2, p. 16]

Section 5: Ensuring a Fair Chance for NGVs and FCEVs is Essential to Achieving National Goals [EPA-HQ-OAR-2010-0799-7941-A2, p. 16]

The environmental and energy security risks posed by the transportation sector's dependence on oil are urgent challenges for the United States, and it would be a mistake for the Agencies to inadvertently and prematurely discourage the development of any promising technology that could help address these threats -let alone two technologies with the enormous potential of NGVs and FCEVs. In the near term, NGVs fueled by newly-abundant domestic natural gas supplies offer a unique combination of vehicle choice and affordability for consumers, low emissions, and replacement (not just reduction) of petroleum consumption. In the long term, NGVs are an essential bridge to the commercialization of FCEVs, which can provide the near-zero emission operation of EVs but with much greater range and much faster refueling. [EPA-HQ-OAR-2010-0799-7941-A2, pp. 16-17]

Despite the promise of both NGVs and FCEVs, the Agencies have not forecasted substantial adoption of either technology during the 2017-2025 period.54 While we believe this is due in part to flaws in the stakeholder consultation process,55 it also reflects the reality that the status quo will not change unless a robust, nationwide gaseous refueling infrastructure is developed. VNG believes that it and others can have this robust national natural gas refueling infrastructure in place by 2025 if the government broadly and the Agencies specifically support the deployment of NGVs with appropriate incentives, similar to EVs. Then, even if FCEVs are still a niche technology by 2025, this natural gas infrastructure will provide a foundation to incrementally provide hydrogen fuel going forward, ensuring that FCEVs do not encounter the extreme 'chicken and egg' dilemma that all alternative fuels currently face. [EPA-HQ-OAR-2010-0799-7941-A2, p. 17]

It is critical for the Agencies to provide appropriate support for the natural gas-to-hydrogen path so that both NGVs and FCEVs will be a viable option for consumers and automakers from 2017 to 2025, as well as during the post-2025 period as emission and fuel economy standards become ever more stringent. Keeping this gaseous fuel pathway 'open' to automakers is particularly important given the Agencies' acknowledged and well-founded concerns over the consumer acceptance of EV technology due to cost as well as range and refueling issues.56 It is, simply, too soon to put all of the Nation's eggs in the EV basket - and it would be a clear mistake to overlook the gaseous fuel pathway just as the supplies and economics of natural gas in the US are undergoing a historic transformation. Ultimately, both EVs and FCEVs will be necessary to achieve long-term environmental and energy security goals, and NGVs will play an essential role in reducing ICE vehicle emissions as well as enabling the transition to hydrogen. [EPA-HQ-OAR-2010-0799-7941-A2, p. 17]

To summarize, for the reasons explained in these Comments, VNG urges the Agencies to adopt the favorable NGV provisions proposed in the NPRM, including:

• Utility factors to determine natural gas fuel use for dual-fuel NGVs; [EPA-HQ-OAR-2010-0799-7941-A2, p. 17]

• Credits for deployment of 'game-changing' technologies for full-size pickups, potentially including NGV capability; [EPA-HQ-OAR-2010-0799-7941-A2, p. 18]

• The option for automakers to use new EPA rules for dual-fuel NGVs beginning in 2012; and, [EPA-HQ-OAR-2010-0799-7941-A2, p. 18]

• NHTSA's proposal for a strong regime for measuring fuel economy for dual-fuel NGVs after the expiration of statutory credits in 2019 VNG also urges the Agencies to incorporate the following provisions to provide more appropriate, fair, and consistent incentives for NGVs: [EPA-HQ-OAR-2010-0799-7941-A2, p. 18]

• Multipliers for dual-fuel NGVs on par with multipliers for PHEVs, and multipliers for dedicated NGVs equal to those for EVs; [EPA-HQ-OAR-2010-0799-7941-A2, p. 18]

• An extension of the current calculation of NGV GHG emissions as 0.15 times those of gasoline emissions (equivalent to CAFE credits), for a similar duration as the 0 g/mile emissions incentive for EVs. Measured emissions levels would similarly be phased in after 2022 on the same schedule that EV emissions begin to be measured according to their upstream emissions; and, [EPA-HQ-OAR-2010-0799-7941-A2, p. 18]

• Appropriate fuel economy credits for dual-fuel NGVs between 2012 and 2019.

We greatly appreciated having the time to meet last Thursday, and would like to provide more extensive comments on our core arguments for improved incentives for natural gas vehicles (NGVs) under the above-referenced rulemaking. As we discussed, natural gas can play an essential and *unique* role in achieving EPA's mandate for long-term reductions in transportation greenhouse gas (GHG) emissions, as well as the "All of the Above" energy strategy articulated by the President. Because NGVs face market barriers similar to other advanced technologies, particularly in terms of fuel distribution, we believe they merit a similarly structured set of incentives. [EPA-HQ-OAR-2010-0799-11797-A1, p. 1]

Natural gas has truly unique "game-changing" potential as an alternative fuel, playing a dual role by providing the lowest possible emissions for internal combustion engine (ICE) vehicles (and light trucks in particular) in the long term while also directly reducing barriers to commercialization for hydrogen fuel cell electric vehicles (FCEV): [EPA-HQ-OAR-2010-0799-11797-A1, p. 1]

Long-Term ICE Pathway: Thanks to plentiful domestic supplies and a robust long-distance pipeline distribution network, natural gas is the only alternative fuel capable of substantially reducing GHG emissions from ICE vehicles on a mass-market, nationwide basis. ICE vehicles will continue to dominate the market for the foreseeable future and will make major advances in fuel efficiency in the years ahead, making it important to ensure that these vehicles will have the opportunity to run on the cleanest fuel possible. In addition to 24% tailpipe reductions of GHGs today, natural gas emissions can be reduced even further through blending with biogas and/or hydrogen. In particular, NGV capability is very well suited to pickup trucks and other light trucks, vehicle classes that are critical to maintaining consumer choice (and thus the economic practicability of these regulations) and are unlikely to be a viable application for battery-based electrification. [EPA-HQ-OAR-2010-0799-11797-A1, pp. 1-2]

Bridge to Hydrogen: The deployment of NGVs and CNG refueling structure will directly reduce the market barriers to the commercialization of FCEVs. The gaseous fuel management and storage technologies used by NGVs are analogous to those that will be used by FCEVs – and, perhaps more importantly, the compressed natural gas (CNG) fueling infrastructure developed for NGVs can be used as a platform for the production and dispensing of hydrogen fuel. Thus, the investments made by companies like VNG for CNG fueling equipment today will directly reduce the costs and build-out time of a future hydrogen dispensing network. A transition to FCEVs can then proceed incrementally through the introduction of hydrogen-natural gas blends and hydrogen-fueled ICE vehicles. [EPA-HQ-OAR-2010-0799-11797-A1, p. 2]

This unique combination of two “game-changing” pathways for NGVs merits a unique set of incentives that recognize that, while NGVs are not the same as battery electric vehicles (BEVs) or FCEVs, they merit a similarly-structured program of consistent, meaningful incentives over the 2017-2025 period. As with BEVs and FCEVs, the NGV program should include: [EPA-HQ-OAR-2010-0799-11797-A1, p. 2]

Emission Incentive: An extension of the current incentive (0.15x gasoline equivalent) for measuring the GHG emissions of CNG through 2021, after which the incentive would be phased out on the same production volume basis as the 0 g/mi emissions incentive for BEVs and FCEVs. [EPA-HQ-OAR-2010-0799-11797-A1, p. 2]

While interest in NGVs is growing due to the increasingly compelling economics of U.S. natural gas, they face the same barriers to the market as other advanced technologies – particularly with regard to infrastructure costs. In referring to incentives for BEVs and FCEVs, the NPRM states: [EPA-HQ-OAR-2010-0799-11797-A1, p. 2]

EPA believes that the relatively minor impact on GHG reductions in the near term is justified by promoting technologies that have significant transportation GHG emissions and oil consumption game-changing potential in the longer run, and that also face major market barriers in entering a market that has been dominated by gasoline vehicle technology and infrastructure for over 100 years. [EPA-HQ-OAR-2010-0799-11797-A1, pp. 2-3]

Given the dual “game-changing” potential of natural gas, as well as the shared barriers posed by the historic dominance of gasoline, this rationale also justifies a similarly-structured program of incentives for NGVs. As with BEV and FCEV incentives, incentives for NGVs should be limited in duration, and these limits combined with the small proportion of NGVs likely to be produced compared to gasoline vehicles should ensure that the impact on GHG reductions from NGV incentives will also remain low. And, as we noted in our meeting, the mid-term review of the regulations in 2018 will also provide an opportunity for an “off-ramp” if unexpectedly rapid uptake of NGVs leads to a risk of “catastrophic success” in terms of impacts on the rule’s GHG reductions. [EPA-HQ-OAR-2010-0799-11797-A1, p. 3]

The following attachment will provide greater detail on these arguments. [EPA-HQ-OAR-2010-0799-11797-A1, p. 3]

[See Docket Numbers EPA-HQ-OAR-2010-0799-11797-A2 and EPA-HQ-OAR-2010-0799-11797-A3 for the above mentioned attachments.]

---

4 http://www.whitehouse.gov/the-press-office/20 12/01/24/remarks-president-state-union-address

5 http://online.wsj.com/article/SB20001424052748703399204574507440795971268.html

6 http://www.whitehouse.gov/the-press-office/2012/01/24/remarks-president-state-union-address

7 http://www.afdc.energy.gov/afdc/pdfs/afur jul 11.pdf

8 http://tonto.eia.doe.gov/dnav/ng/hist/n9190us3a.htm

9 http://www.businessweek.com/news/20 12-01-13/chrvsler-to-begin-natural-gas-truck-sales-to-flccts-in2012.html

10 http://greet.es.anl.gov/results

14 EJSA 2007, Sec. 20J(1)(B)(ii)(V)

15 http://www.arb.ca.gov/msproglzevproglfactsheets/zev fs.pdf

16 http://www.arb.ca.gov/fuels/lcfs/J21409Icfs Jutables.pdf

31 The incremental cost of adding E85 'flex fuel' is much lower than the incremental cost of adding a dual-fuel capability so automakers have maximized their production of “flex fuel' vehicles and exhausted the incentives. http://www.nhtsa.gov/staticfiles/rulemakinglpdf/Flexible_Fuel Credits 2003 2010.pdf

42 Cannon, James S. 'Gearing Up for Hydrogen: America's Road to Sustainable Transportation.' Inform. 1998. httn://www.informinc.orglgearinghydrogen.php

43 http://205.254.148.40/hydrogenandfuelcells/pdfs/h2 tech roadmap.pdf

44 http://greet.es.anl.gov/results

45 http:/1205.254.148.40/hydrogenandfuelcells/pdfs/h2 tech roadmap.pdf

52 NHTSA may wish to reconsider this earlier decision in light of the changed circumstances since 1996 and the need to avoid an absurd result that Congress could not have intended and that

is contrary to the goals of the regulation. National Highway Traffic Safety Administration. Denial of Petition for Reconsideration in Docket 94-96, August 29, 1996, Federal Register Volume 61 Number 173, September 5, 1996.

53 As a practical matter, credits for this new category of vehicles could be administered under EPA's EPCA authority in the same fashion as NHTSA credits for improved air conditioner efficiency, 'game-changing' technologies for full-size pickups, 'off-cycle' technologies, and the post-2020 regime for NHTSA dual fuel NGV credits are proposed to be administered in this NPRM.

55 The Agencies' analysis for the rulemaking was driven by automakers' current production plans, which themselves are a reaction to previous rulemakings. While this focus is understandable, it is important for the achievement of the Agencies' goals, as well as the satisfaction of their responsibilities under the Administrative Procedure Act, that they give full consideration to all realistically viable alternatives that could playa significant role through 2025 and beyond - and not just those that enjoyed the most attention from automakers and regulators at the time of the rulemaking.

Response:

Arbitrary Distinction Between EVs/PHEVs and CNG Vehicles

A number of commenters argued that providing incentives for EV/PHEV/FCVs and not for CNG vehicles was arbitrary and capricious. EPA disagrees. First, EVs perform markedly better than CNG vehicles from a greenhouse gas emissions perspective, both on a tailpipe-only measurement, and when considering upstream plus tailpipe GHG emissions (see preamble Table III-16). For this reason, EPA does not consider CNG vehicles to be a long-term GHG emissions game-changer. Second, EVs/PHEVs face greater market barriers, including lower vehicle range, higher vehicle cost, and a much different refueling paradigm including a much longer refueling time, relative to CNG vehicles. In any case, the final rule provides an incentive, in the form of a multiplier, for CNG vehicles as explained immediately below.

Multiplier incentive for CNG vehicles for MYs 2017-2021

EPA did not propose, but did ask for comment on, incentives for dedicated and dual fuel CNG vehicles. A large majority of public commenters supported incentives for all CNG vehicles. EPA has finalized temporary incentive multipliers for all dedicated and dual fuel CNG vehicles for MYs 2017-2021 equal to those for PHEVs: 1.6 in MYs 2017-2019, 1.45 in MY 2020, and 1.3 in MY 2021. While EPA does not consider CNG vehicle technology to be a long-term GHG emissions game-changer, the Agency does believe that investments in CNG vehicle technology and refueling infrastructure could be valuable in helping to facilitate future commercialization of hydrogen fuel cell vehicles, which does have the potential to be a long-term GHG emissions game-changer. See Preamble Section III.C.2.c.iv for a much more extensive discussion of the GHG emissions benefits of current CNG vehicles relative to current gasoline and electric vehicles (see Table III-16), and why we believe CNG vehicle technology and refueling infrastructure can facilitate hydrogen fuel cell vehicle commercialization.

Toyota commented that, if CNG vehicles were to receive an incentive multiplier, then conventional hybrid electric vehicles should receive a multiplier as well. Although the Agency agrees with Toyota that conventional hybrids share many of the same electric drive components of EVs and PHEVs (e.g., batteries, motors, controllers), with respect to consumer acceptance and barriers to utilization, the Agency believes that conventional hybrids are much more similar to gasoline vehicles than they are to EVs, in that all of the propulsion energy comes from gasoline, vehicle range is improved, and hybrids need no new refueling infrastructure. As such there is not the same degree of market barriers inhibiting increased use of this technology. Accordingly, EPA is not adopting incentive multipliers for conventional hybrid vehicles. This final rule does provide a credit mechanism to encourage penetration of hybrid technology into the full-size pickup truck class.

See Section 6.6 for a discussion of why EPA is not using the 0.15 factor for GHG emissions compliance, but is adopting the 0.15 factor for the CAFE program beginning in MY 2020, for all nonpetroleum fuels.

<u>Adoption of utility factors for dual fuel CNG vehicles</u>

Commenters expressed widespread support for the EPA proposal to apply the PHEV-based utility factor methodology for weighting operation of natural gas and gasoline for dual fuel CNG vehicle compliance calculations. For a discussion of EPA's rationale for adopting utility factors for dual fuel vehicles, as well as the eligibility requirements that dual fuel vehicles must meet in order to use the utility factor approach, see Preamble Section III.C.4.a.ii.

6.3. Ethanol Flexible Fuel Vehicles

<u>Organizations Included in this Section</u>

25x'25 Alliance
Alliance of Automobile Manufacturers
American Council on Renewable Energy (ACORE) and Biomass Coordinating Council (BCC)
American Forest and Paper Association & American Wood Council
American Honda Motor Co., Inc.
American Petroleum Institute (API)
Clean Fuels Development Coalition (CDFC)
E100 Ethanol Group
Ford Motor Company
General Motors Company Growth Energy
Minnesota Department of Commerce
National Alliance of Forest Owners (NAFO)
National Association of Convenience Stores (NACS)
National Corn Growers Association et al.
Plant Oil Powered Diesel Fuel Systems, Inc.
Renewable Fuels Association (RFA)

Volkswagen Group of America

Organization: 25x'25 Alliance

Introduction and Request for Consideration

The 25x'25 Alliance, American Council on Renewable Energy, American Seed Trade Association, Association of Equipment Manufacturers, American Farm Bureau Federation, Biotechnology Industry Organization, National Association of Wheat Growers, National Farmers Union and National Sorghum Producers (hereinafter referred to as "25x'25 partners") seek leave to file late comments in the above-referenced dockets and respectfully submit such comments. These comments respond to the original notice of the proposed rule, 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, published in the *Federal Register* on December 1, 2011 (76 FR 74854). 25x'25 partners submit that the Environmental Protection Agency ("EPA") and the National Highway Traffic Safety Administration ("NHTSA") should accept and consider these comments, despite their late filing, for the following reasons:

- Additional comments are, as of this date, still being solicited and accepted electronically on the EPA website for this proceeding at http://www.nhtsa.gov/fuel-economy.
- In an earlier extension of the comment period in this proceeding issued on January 6, 2012, EPA and NHTSA stated that "NHTSA and EPA will consider all comments received before the close of business on the comment closing date, and will also consider comments received after that date to the extent practicable."
- 25x'25 partners submit that it is only in light of recent analyses of market trends and events that they could reasonably have understood the implications of the proposed rule as reflected in the comments submitted herein.
- 25x'25 partners have not submitted prior comments.
- 25x'25 partners accept the record as it is and do not seek any delay in the issuance of a final rule in this proceeding.
- 25x'25 partners have reviewed such submitted comments only insofar as necessary to discern whether other commenters have raised the substantive issues 25x'25 partners seek to have EPA and NHTSA consider.
- Consideration of these late-filed comments, to the extent practicable given the timing and the otherwise relatively complete state of the record, is therefore in the public interest.

25x'25 partners, representing a coalition of farm and related public policy organizations, understand the importance of flexible fuel vehicles and the greenhouse gas reduction potential of biofuels and offer the following comments on the following issues:

Background Information

The continued production of flexible fuel vehicles (FFVs) and the advancement of biofuels into the market are critical to expanding renewable fuel use, reducing greenhouse gas (GHG) emissions, and enhancing air quality. Today, nearly 12 million FFVs operate on American roadways. The use of midlevel ethanol blends and E85 in FFVs is a cost-effective and efficient way to help meet the agencies' ambitious standards for improving tailpipe emissions through biofuels utilization. Ethanol and other advanced biofuels such as biobutanol facilitate CO_2 emission reductions both within the vehicle, and, more importantly, throughout its production and combustion life cycle. Furthermore, increased biofuel use contributes to public health: Higher ethanol blends reduce emissions of hazardous air pollutants such as particulate matter (PM 2.5 and ultrafine particles) that result from the burning of aromatic hydrocarbons such as benzene, toluene, and xylene found in conventional fuels.

Despite the many benefits of biofuels, the proposed rule effectively eliminates statutory incentives intended to promote their use. Moreover, it appears to pick favorites by providing much more generous credits to other "advanced vehicle technologies," such as electric and plug-in hybrid vehicles. After a careful review of the proposed new rule in light of recent developments, we believe that the rule:

1. Does not sufficiently incentivize the production of FFVs; and

2. Does not adequately value the GHG reduction potential of biofuels.

Together, these oversights place the rule in conflict with other established national priorities, policies, and legislation (such as the federal Renewable Fuel Standard (RFS) and the Energy Independence and Security Act (EISA)) while ignoring the economic, public health, and environmental benefits that can be achieved through increased biofuel usage.

Rationale for Modification to the Rule

The automotive industry is a business characterized by high capital and development costs, and long vehicle development and life cycles. The proposed GHG standards are very stringent and will drive long-term change in the industry, requiring careful allocation of limited development and capital funds to produce the greatest reduction in GHGs. The proposed rule puts forward a common-sense approach to establishing the adoption of two selected technologies by making their future compliance value clear throughout the life of the rule, which states:

"EPA is proposing that CO_2 compliance values for plug-in hybrid electric vehicles (PHEVs) and bi-fuel compressed natural gas (CNG) vehicles will be based on estimated use of the alternative fuels, recognizing that, once a consumer has paid several thousand dollars to be able to use a fuel that is considerably cheaper than gasoline, it is very likely that the consumer will seek to use the cheaper fuel as much as possible. Accordingly, for CO_2 emissions compliance, EPA is proposing to use the Society of Automotive Engineers ''utility factor'' methodology (based on vehicle range on the alternative fuel and typical daily travel mileage) to determine the assumed percentage of operation on gasoline and percentage of operation on the alternative fuel for both PHEVs and bi-fuel CNG vehicles, along with the CO_2 emissions test values on the alternative fuel and gasoline." (*76 FR 74880)*

This approach of forecasting a high usage rate for the selected fuels and fixing the rate for the duration of the rules provides certainty as to the future CO_2 compliance value of these technologies. This certainty is needed by auto manufacturers to enable informed long-term investment trade-offs to be developed regarding these technologies.

However, EPA does not provide a similar level of certainty with regard to ethanol FFVs. Rather, it makes a backward-looking argument to estimate future E85 use. "Actual use," presumably after the fuel has been used, has been proposed as a way to calculate E85 CO_2 compliance values. EPA cites patterns of historical usage of E85 in FFVs, ignoring the rapidly increasing production of renewable fuels needed to comply with the RFS contained in the 2007 Energy Independence and Security Act (EISA). Most forecasts of the implementation of this act foresee significant increases in the usage of higher ethanol blends in flex-fuel vehicles, as opposed to past ethanol usage being constrained by the availability of higher blends than E10.

While the "actual use" approach that EPA proposes offers the hope that FFVs would be able to use the E85 CO_2 compliance values once these vehicles are designed, developed, and sold, this hope is a poor substitute for the certainty offered for PHEV and bi-fuel CNG vehicles. It is unlikely that automakers would invest in FFVs based on the uncertain prospect of a CO_2 compliance benefit when other technologies are certain to yield a CO_2 compliance benefit. The resulting shortage of FFVs will make EPA's implementation of the EISA more challenging.

Unlike natural gas and electricity, ethanol and other potential drop-in biofuels used in FFVs have inherent "lifecycle" CO_2 reduction benefits. As outlined in the EISA, ethanol must meet one of several GHG reduction targets. Taking only the currently predominant fuel, corn-based ethanol, EPA itself has found that, on average, corn-based ethanol meets the 20 percent reduction in GHG emissions required in the EISA.

Yet the proposed rule ensures that even if manufacturers could prove that their FFVs ran *solely* on ethanol, they would have no regulatory incentive to include such cars in their fleet. This is because the "0.15 divisor," a statutorily-mandated incentive that boosts the effective fuel economy of FFVs under the CAFE program, is omitted by EPA under the proposed CO_2 standards. Since fuel economy and CO_2 are directly correlated, the absence of an incentive in the EPA portion of the rule eliminates any benefit a manufacturer might gain from utilizing the incentive under the CAFE standards. In other words, the proposed rule not only fails to provide additional incentives for alternative fuel vehicles, it effectively eliminates existing incentives, thereby benefiting petroleum at the expense of cleaner alternatives. In the long run, the removal of a statutory incentive for alternative fuel vehicles will harm air quality, increase GHG emissions, and slow the development of clean alternatives to petroleum-based fuel.

Given the considerable influence the final CAFE-GHG rule will have on the synergistic relationship between fuels and vehicles between 2017 and 2025, and likely beyond, it is imperative the agencies give thoughtful consideration to how future fuels and vehicles can seamlessly and cost-effectively comply with the objectives of this rulemaking. With respect to biofuels, the use of E10 and E15 in legacy and newer vehicles between 2017 and 2025 will prove to be an inadequate substitute for the role FFVs can and should play. If FFVs are adequately incentivized in the final rule, use of E85 and other blends of ethanol in these vehicles will ensure compliance with the 2017-2025 rulemaking and fulfillment of the RFS by 2022 in a way that avoids the infrastructure costs, implementation hang-ups, and legal challenges that have surrounded the E15 waiver.

Recommended Changes to the Rule

The remedy for addressing the lack of parity for FFVs and biofuels is clear: The agencies can and should provide a level playing field for each vehicle technology. Further, the life-cycle CO_2 reductions that ethanol provides must be recognized, and the CAFE incentive for biofuels must be preserved in the combined EPA/NHTSA rule. To these ends, EPA should:

1. Either:

a. Use the Society of Automotive Engineers ‘‘utility factor’’ methodology (based on vehicle range on the alternative fuel and typical daily travel mileage) to determine the assumed percentage of operation on gasoline and percentage of operation on the alternative fuel. This will provide equity in treatment of alternative fuels and create a sensible incentive for continued production of FFVs.

Or:

b. Adopt the recommendation offered by the Alliance of Automobile Manufacturers to maintain meaningful FFV credits in the final rule. By using this alternative methodology based on E85 usage in FFVs to calculate GHG emission reductions, a sensible incentive for continued production of FFVs is created.

2. Add the life-cycle CO_2 reduction benefits of ethanol to the CO_2 compliance standards by providing a multiplier showing life-cycle CO_2 reduction, rather than simply measuring tailpipe CO_2 emissions, for all blends containing biofuels. This calculus must take into account *at least* the recognized minimum life-cycle CO_2 reduction of 20% for the biofuel portion of any fuel blend. This would be a conservative recognition of ethanol’s GHG benefits in light of the fact that future ethanol must meet the requirement of advanced biofuels and achieve a 50 percent GHG reduction.

3. At blends of E85 or higher, a 0.15 multiplier must be used for CO_2 calculations, in order to preserve existing statutory incentives for alternative fuels. The inclusion of this multiplier in CO_2 standards would align with EPA’s mandate to reduce emissions of GHG and other pollutants, because it will promote investment into alternative engines and fuels that reduce CO_2 on a life-cycle basis, while at the same time reducing a variety of other dangerous criteria pollutants.

These three changes would provide greater certainty in the manufacturing of FFVs and additional credit for biofuel usage based on sound science.

Conclusion

As written, the rule could have devastating economic consequences. Failure to meet the biofuel volume targets of the RFS due to an absence of vehicles, because of the lack of meaningful incentives for manufacturers to produce FFVs, would adversely impact America’s agricultural and rural economies and our national energy security. EPA’s Regulatory Impact Analysis of the RFS2, released in February of 2010, concluded that the implementation of the Renewable Fuel Program would, in the year 2022 (relative to 2007), increase farm income by $13 billion or 36 percent, improve energy security by $2.6 billion, and reduce our nation's expenditures on foreign oil by $41.5 billion. It would also reduce the cost of corn ethanol production by 13 cents per gallon and cut fuel costs by 2.4 cents per gallon for gasoline and 12.1 cents for diesel fuel. In addition, the monetized health benefits were estimated to be as high as $2.2 billion. This potential, as well as the many gains already made in moving toward the RFS goals, would be jeopardized by the proposed rule.

As noted earlier, the production of FFVs using ethanol and advanced biofuels is a cost-effective means for auto manufacturers to achieve GHG reductions. It is important to note that FFV incentives represent no cost to taxpayers or the government and no additional costs to consumers. Other vehicle technologies, such as natural gas, will require far more resources to establish the infrastructure necessary to enable them to have a meaningful impact on the market.

In summary, the proposed rule will become a self-fulfilling prophecy, one that will create negative outcomes both for consumers and for the environment. The rule presupposes that FFV owners will not elect to use biofuels on the assumption that ethanol fuel blends will remain as expensive as standard gasoline, without the same driving range. Drivers are therefore assumed not to take actual advantage of the potential GHG savings their vehicles make possible. There is also assumed to be no incremental push toward biofuel blends based on their ability to provide the higher octane required for better mileage with lower PM emissions than conventional gasoline despite accumulating evidence for major health problems from such PM emissions.

These assumptions drive the proposed rule to deny the credit for GHG savings that FFVs would deserve if they were used with biofuels. The problem is then compounded by the absence of *any* incentive for alternative fuels under EPA's CO_2 standards, even for dedicated vehicles, thus eliminating the benefit purportedly offered under the CAFE rules. This loss of credit ensures that vehicle manufacturers have no real world incentive to manufacture such vehicles, despite the modest incremental cost of making an FFV compared to a standard motor vehicle. The net effect will result in dramatic declines in FFV manufacture. The dramatic decline in FFV production will then ensure that customers will not be able to purchase FFVs even if biofuel blends are available in widespread locations or are available at costs considerably less than standard gasoline as a function of the major biofuels production scale-up the RFS calls for. Seeing the prospective loss of their major new market and the potential for very poor investment recovery, biofuel producers will simply not make the investments required to produce biofuels at scale.

As a result, the nation will fail to achieve the Renewable Fuel Standard, the rural American economy will lose its biggest opportunity for sustained economic health in generations, and the high-compression engines required to produce fuel economy will not have a high-octane fuel free of the toxic emissions that already comprise a major unaddressed health problem today. Only biofuel blends can provide the critical octane while decreasing PM emissions, but this rule will ensure it is not available for that purpose. And biofuels offer a better alternative for GHG reduction, both in use and in manufacture, than natural gas vehicles or electric vehicles powered by electricity generated – as 70 percent currently is – by fossil fuels, with the inherent GHG emissions and 33% average energy conversion efficiency of the electric grid.

In short, the proposed rule sets up a cascade of negative effects that will deprive biofuels of their opportunity to make a critical contribution to national policy only they can make, and it does so simply by embodying an implicit assumption that biofuels will not make that contribution because they have not already done so. 25x'25 partners appreciate the opportunity to submit late-filed comments on the proposed rule and urge their consideration to the extent practicable by EPA and NHTSA in adopting a final rule. Please feel free to contact us with any questions related to information contained within these comments. [EPA-HQ-OAR-2010-0799-11818]

Organization: Alliance of Automobile Manufacturers

In the final rulemaking for MY 2012-2016, EPA created regulations for MY 2016 ethanol flex-fuel vehicles (FFVs) that differed significantly from those provided for by EPCA. EPA ended the GHG emissions compliance incentives and adopted a methodology based on demonstrated vehicle emissions performance. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

For MY 2016, EPA proposed awarding CO_2 credits upon demonstration of actual usage of E85. EPA now proposes extending MY 2016 approach to MYs 2017-2025. In the MY 2012-2016 rulemaking, EPA offered two options for automobile manufacturers to consider:
(1) a default system based on 100% gasoline operation and (2) fuel economy weightings on national E85 use, or on manufacturer-specific data showing the percentage of miles that are driven on E85 versus gasoline for that manufacturer's ethanol FFVs. The Alliance supports the determination of CO_2 credits based on national E85 usage. The idea of actual national usage would be in conjunction with an early issuance of guidance to manufacturers indicating the value of the F-factor so that manufacturers can develop their vehicle portfolios and GHG compliance plans. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The "F factor" is used in the calculation of Carbon Related Exhaust Emissions (CREE) of flex-fuel vehicle and represents the relative usage of gasoline and E85. The calculation of "F" needs to take into account the following: [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The volume of ethanol used in motor vehicles. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The volume of ethanol available to the flex-fuel fleet. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The volume of E85 available to the flex-fuel fleet. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The fleet of active flex-fuel cars and trucks by model year. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The miles traveled by the fleet of active flex-fuel cars and trucks. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The total grams of CO_2 emitted by the fleet of active flex-fuel cars and trucks. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The CO_2 emissions of the flex-fuel fleet on E85. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

The proportion of the fuel used by the flex-fuel vehicle fleet that is E85. [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

Volume of Ethanol Used in Motor Vehicles [EPA-HQ-OAR-2010-0799-9487-A1, p.66]

EISA makes clear the volumes of renewable fuels that are to be used in the United States through 2022 and then maintains this proportion in 2023 and beyond. For example, the total renewable fuel requirement for 2016 is 22.25 billion ethanol equivalent gallons. EISA does not give guidance as to whether the fuels marketed or imported to meet these requirements will be ethanol, biodiesel or some other renewable fuel. Our recommendation is to use the Energy Information Agency Annual Energy Outlook Liquid Fuels Supply and Disposition forecasts volumes for ethanol, biodiesel and “other biomass-derived liquids.” The ratios between the three fuels can be used to determine the amount of ethanol to be used in any given year. For example, in 2016, the 2011 reference case forecast is 16.108 million gallons of ethanol, 1.381 million gallons of biodiesel and 307 million gallons of other biomass-derived liquids. This gives a ratio of 9.54 gallons of ethanol per gallon of other fuels. Assuming that both the biodiesel and other biomass-derived liquids have a RIN value of 1.5 and the ethanol has a RIN value of 1.0. The volume of ethanol required = 9.54 gallons of ethanol per 11.04 RINs (9.54+1.5) multiplied by 22.25 billion RINs or 19.23 billion gallons of ethanol. The corresponding volume of biodiesel plus other biomass-derived liquids would be 2.01 billion gallons. [EPA-HQ-OAR-2010-0799-9487-A1, pp.66-67]

Volume of Ethanol Available to the Flex-Fuel Fleet [EPA-HQ-OAR-2010-0799-9487-A1, p.67]

This is determined by subtracting the ethanol volumes used for gasoline blending from the total volume of ethanol. This is done by determining the total volume of hydrocarbons used in motor gasoline (this can be determined using the EIA AEO Liquid Fuels Supply and Disposition forecasts volumes) and dividing by 9 to determine the ethanol used for blending E10. For 2016, this is 14.30 billion gallons of ethanol used in gasoline blending. When this is subtracted from the 19.23 billion gallons of ethanol to be used, the resulting volume of ethanol to be used in the flex-fuel fleet is 4.97 billion gallons. [EPA-HQ-OAR-2010-0799-9487-A1, p.67]

Volume of E85 Available to the Flex-Fuel Fleet [EPA-HQ-OAR-2010-0799-9487-A1, p.67]

The volume of E85 available to the flex-fuel fleet is determined by dividing the volume of ethanol to be used by the flex-fuel fleet by the fractional ethanol content of the E85 certification fuel for the model year being evaluated (currently 0.85). [EPA-HQ-OAR-2010-0799-9487-A1, p.67]

Fleet of Active Flex-fuel Cars and Trucks by Model Year [EPA-HQ-OAR-2010-0799-9487-A1, p.67]

This can be done by obtaining vehicle registration data from a commercial company such as R. L. Polk and screening for flex-fuel vehicles. Alternatively, reported manufacturer FFV production by model year can be used, with the volumes reduced using vehicle survival rates from Table 4-3, “Survival Rates and Unadjusted Annual Miles Traveled (VMT) by Age for

Passenger Cars" and Table 4-4 "Survival Rates and Unadjusted Annual Vehicle-Miles Traveled (VMT) by Age for Light Trucks" from "Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards Joint Technical Support Document," April 2010 (2010 TSD). [EPA-HQ-OAR-2010-0799-9487-A1, p.67]

Miles Traveled by the Fleet of Active Flex-fuel Cars and Trucks [EPA-HQ-OAR-2010-0799-9487-A1, p.67]

Multiply the number of flex-fuel cars and trucks of each model year by the appropriate miles traveled per year for each model years' age obtained from Table 4-3, "Survival Rates and Unadjusted Annual Miles Traveled (VMT) by Age for Passenger Cars" and Table 4-4 "Survival Rates and Unadjusted Annual Vehicle-Miles Traveled (VMT) by Age for Light Trucks" from the 2010 TSD. [EPA-HQ-OAR-2010-0799-9487-A1, p.67]

Total Grams of CO_2 Emitted by the Fleet of Active Flex-fuel Cars and Trucks [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

Convert the average fuel efficiencies of U.S. light-duty vehicles (available from the Research and Innovative Technology Administration, Bureau of Transportation Statistics, table 4-23) to grams of CO_2 per mile using the conversion factor of 8,887 grams CO_2 per gallon of gasoline. For any model year too recent to be included in the Bureau of Transportation Statistics table, use the projected fleet-wide emissions compliance levels under the MY 2012-2016 or MY 2017-2025 final rules, as appropriate. Multiply the vehicle miles traveled for the cars and trucks of each model year by the CO_2 emissions per mile of the cars and trucks of each model year. Sum the CO_2 emissions for each model year of cars and trucks on the road. [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

CO_2 Emissions of the Flex-Fuel Fleet on E85 [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

Multiply the E85 volume available by the grams of CO_2 per gallon of E85 certification fuel for the model year being evaluated (currently 6,295). [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

Proportion of the Fuel Used by the Flex-fuel Vehicle Fleet That is E85 [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

Divide the CO_2 emissions of the flex-fuel fleet on E85 by the total CO_2 emissions of the flex-fuel fleet. This fraction is the value, F, used in the CREE calculation. [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

Organization: American Council on Renewable Energy (ACORE) and Biomass Coordinating Council (BCC)

The proposed rules, NHTSA-2010-0131 and EPA-HQ-OAR-2010-0162, focus almost exclusively on automobile efficiency and largely neglect the crucial role of fuels. Considering the ambitious fuel efficiency targets proposed under the new GHG and CAFE rules (average US fleet fuel economy of 54.5 mpg by 2025), fuels are especially important and deserve inclusion in this legislation. If the automobile manufacturers are required to make all the changes necessary to meet these targets without any improvement in fuel quality, there is a serious risk that technologies will be implemented increasing fuel efficiency by sacrificing air quality, cost effectiveness, and consumer choices in terms of size, weight and power of the engine. [EPA-HQ-OAR-2010-0799-9593-A2, p. 1]

Octane enhancement is necessary for gasoline (refined from petroleum feedstock) to be used as a transportation fuel. Octane enhancement can be obtained from a variety of sources, including a wide range of domestically produced biofuels. Octane enhancing substances can also be produced from petroleum, through a further refining process. [EPA-HQ-OAR-2010-0799-9593-A2, p. 1]

The principle message of my letter is to submit that there appears to be little substantial rationale in continuing with high levels of fossil-based aromatic hydrocarbons (BTX-benzene, toluene and xylene) to meet octane needs of gasoline when renewable ethanol, less toxic and damaging to human health, is readily available at comparable prices, is domestic and renewable, and already used to boost gasoline octane – and can do more at higher blend levels. [EPA-HQ-OAR-2010-0799-9593-A2, p. 1]

A brief examination of the history of transportation fuels in America reveals that the petroleum and petroleum refining industries have exerted considerable effort to ensure that petroleum-based products are used to enhance the octane of gasoline. In the process, the domestic biofuels industry has been essentially sidelined and the US economy could become increasingly dependent on costly imported oil if the ethanol industry is further discounted. [EPA-HQ-OAR-2010-0799-9593-A2, pp. 1-2]

THE RECORD

- In 1864, there was a 9--million gal/yr ethanol industry providing fuel for the “Spirit Lamps” that replaced whale oil in oil lamps because of diminishing supplies and rising prices. [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]
- In 1865, oil was discovered in Titusville PA. There was no market for oil, so it was refined into kerosene to compete with ethanol in lamps. A $2.00 tax per gallon was levied on ethanol to help finance the Civil War. A $0.20 a gallon tax was imposed on Kerosene. The ethanol industry faded, over night, back into the cornfields. [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]
- In the 1920s, cars had advanced to the point where they needed more powerful engines with higher compression ratios. Henry Ford was promoting ethanol (113 octane) as the renewable fuel of the future. However, tetra ethyl lead (a known poison) was more profitable. For decades, lead was used and ethanol again faded. [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]
- In the 1970s, the huge human health impact of lead in gasoline became sufficiently clear to the public, and the environmental and public health communities. This, coupled with the advent of the catalytic converter (the key to cleaner air that is poisoned by lead)

finally, after nearly a half century of damaging public health, spelled the end of lead in gasoline. [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]
- Adding clean burning ethanol to meet octane needs in newer engines was the logical next step from environmental, human health and national security perspectives. However, profitability and market share prevailed; and methyl tertiary butyl ether (MTBE) was used to meet the required octane and oxygen needs. Ethanol was assigned a secondary role as an oxygenate to boost octane. [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]
- When MTBE turned out to be unacceptable in the U.S. market due to leaking underground storage tanks leading to ground water contamination, the oil industry turned to higher levels of aromatics to meet octane needs. Ethanol was again relegated to a secondary role in the octane market – a pattern that has been a part of America's transportation fuels history. [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]
- Controlled markets and profit driven forces in the transportation fuel sector have overpowered public health, environmental considerations and, too often, national/energy security issues – let alone the best interest of the nation. Without public involvement, history will likely repeat itself. [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]

The Biomass Coordinating Council (BCC, of which I am the President) believes that domestically produced biofuels are a superior alternative to petroleum-based octane enhancers. Not only would the use of biofuels in place of BTX reduce air pollution and save billions of dollars each year in health care costs, they would take some of the burden of meeting the EPA's new fuel efficiency goals off the shoulders of automakers. Because the carbon footprint of biofuels is much lower than BTX, their use would effectively increase the fuel efficiency and decrease the carbon footprint of the cars and light trucks that run on them. Crucially, biofuels are now cost-competitive with BTX, and as the price of oil (from which BTX is refined) rises, so will the price of BTX. [EPA-HQ-OAR-2010-0799-9593-A2, p. 3]

Biofuels are superior to petroleum-based compounds for a host of reasons:

1. Use of biofuels enhances our energy security by insulating the economy from geopolitical shocks that have and will continue to adversely affect global oil markets. The oil crisis caused by the Yom Kippur War in the 1970s is a case in point, but more recent instances include last year's civil war in Libya and the current crisis in the Persian Gulf with Iran.

2. The production of biofuels here in the US creates jobs at a time when unemployment remains stubbornly high.

3. Every year, importing oil causes hundreds of billions of dollars to flow out of the US economy. Biofuel production would keep some of that money here at home.

4. In a global economy where research and innovation increasingly determine economic competitiveness, America must strive to remain at the forefront of renewable energy technologies. Investment in the domestic biofuels industry that has made steady progress in recent years would ensure a leading role for the US in this crucial 21st century industry.

5. In addition to producing biofuels, the growth of biomass acts as a carbon sink.

6. Biofuels burn more cleanly than petroleum-based octane enhancers, and do not produce harmful particulate matter that can cause serious health damage

7. Biofuels are cost-competitive with BTX. [EPA-HQ-OAR-2010-0799-9593-A2, p. 3]

It is imperative that the numerous advantages of clean, renewable, domestic octane enhancement be considered during the agencies' deliberations. [EPA-HQ-OAR-2010-0799-9593-A2, p. 3]

Over the course of ten successful years in advancing renewable energy, the American Council On Renewable Energy (ACORE) and the BCC have passionately advocated for all renewable energy but have taken no stance against any other form of energy. In addressing the issue of fuels, the BCC is for: [EPA-HQ-OAR-2010-0799-9593-A2, p. 3]

- Improvements to national and energy security and a reduction in the nation's dependence on oil through increased domestic biofuels production. [EPA-HQ-OAR-2010-0799-9593-A2, p. 4]
- First and second generation biofuels, ethanol and biodiesel, which have been steadily improving in terms of advanced farming practices to reach full sustainability; have increased feedstock yields and production volumes from these yields; have increased byproducts and the market value of these byproducts; have yielded less water and fossil fuel use; contributed to job creation; and have shown profitability without subsidies. All of these successes obviate the food versus fuel issue while internationally reducing the need for grain support programs to the advantage of farmers in developing countries. In short, grain, sugar and starch-based ethanol can compete in the transportation fuels marketplace, particularly with a "level playing field" and consideration given to their reduced carbon footprint. [EPA-HQ-OAR-2010-0799-9593-A2, p. 4]
- Biofuels from biowaste, cellulosic biomass, algae, and other forms of biomass that are now reaching the threshold of commercialization. These gains, coupled with continued advances in grain, sugar and starch-based ethanol, will meet the targets of RFS2 as now established. [EPA-HQ-OAR-2010-0799-9593-A2, p. 4]
- Discovering alternate markets for BTX displaced from the gasoline pool (such as high value petrochemical markets). [EPA-HQ-OAR-2010-0799-9593-A2, p. 4]
- Passage of the Open Fuels Standard, which will provide Americans more choice at the pump, and accelerated authority for the use of E-15 in later model automobiles to increase the number of jobs in domestic biofuel production. [EPA-HQ-OAR-2010-0799-9593-A2, p. 4]
- Increased Corporate Average Fuel Economy Standards, made possible by advanced engine designs with higher compression ratio engines and other breakthroughs in flexible fuel engines with improved efficiencies and greater variability of clean burning fuels. These advances will provide the public with greater choices in terms of bigger, safer, more powerful vehicles while still meeting high-mileage and environmental standards. [EPA-HQ-OAR-2010-0799-9593-A2, p. 4]

The BCC is particularly in favor of a systems approach in dealing with all of these opportunities that can be advanced in ways that improve our economy, create jobs, enhance our environment, and doing so cost effectively with open and unsubsidized market forces. [EPA-HQ-OAR-2010-0799-9593-A2, p. 4]

That systems approach involves four factors:

1. An expanding market for biofuels starting immediately to help steady the price of oil, maintain momentum in the biofuels market, and stimulate the production of cellulosic biomass and algae-based ethanol while encouraging the advance and use of other biofuels, methanol, electricity and hydrogen.

2. Rapidly speeding the production of flex fuel vehicles and refueling stations as called for by the Open Fuels Standard. [EPA-HQ-OAR-2010-0799-9593-A2, p. 4]

3. Reducing the level of aromatics (BTX) in gasoline to limit emissions of highly health-damaging particulate matter, especially ultrafine particulates. [EPA-HQ-OAR-2010-0799-9593-A2, p. 5]

4. Forming a working coalition of stakeholders representing the oil, refining and marketing industries; the auto manufacturers; the biofuels producers and other alternative fuel producers, including advanced biofuels, algae, methanol, natural gas, and hydrogen. This collaborative effort would serve the nation, the public, the environment, and the industries involved. The EPA and the NHTSA should also participate in this collaborative effort. [EPA-HQ-OAR-2010-0799-9593-A2, p. 5]

While the BCC appreciates the agencies' efforts to improve the fuel economy of the US car and light truck fleet, we regret that the current proposed rules focus almost exclusively on car manufacturers, neglecting fuel quality as an important part of the solution. We believe that automobiles and the fuels they consume must be regulated in tandem to allow gains in fuel efficiency to go hand in hand with improvements in air quality and public health. Replacing a portion of the BTX group compounds (aromatics) in gasoline with ethanol or other alcohols is in the interests of the public health, national energy security and the domestic economy. [EPA-HQ-OAR-2010-0799-9593-A2, p. 5]

Congress prudently allowed the Volumetric Ethanol Excise Tax Credit (VEETC) and the tariff on imported ethanol to expire at the end of 2011. The BCC supports unsubsidized transportation fuels markets (including subsidies for fossil fuels as well as biofuels) and therefore also supports the Open Fuel Standard. [EPA-HQ-OAR-2010-0799-9593-A2, p. 5]

Organization: American Forest and Paper Association & American Wood Council

Introduction [EPA-HQ-OAR-2010-0799-9537-A1, p.2]

EPA is proposing tailpipe emission standards that fail to distinguish between CO_2 emissions from cars using fuels derived from biomass ("biofuels") and CO_2 emissions from use of fossil fuels. Treating those two types of emissions the same is inconsistent with both international policies as well as existing EPA regulatory programs. EPA should consider modifying the proposed regulations so that the motor vehicle emissions from biofuels are not counted the same as emissions from fossil fuels in calculating grams of CO_2 emissions per mile, to reflect the role of the carbon cycle in biofuel production and combustion and to further encourage use of renewable fuels. This would (1) make the GHG tailpipe emission standards consistent with the endangerment that the standards are supposed to be mitigating and (2) encourage the substitution of renewable fuels for fossil fuels, which EPA already is seeking to accomplish through other provisions in the proposed GHG tailpipe standards. [EPA-HQ-OAR-2010-0799-9537-A1, p.2]

The Carbon-neutrality of CO_2 Emissions from Biofuel Combustion Is Widely Recognized [EPA-HQ-OAR-2010-0799-9537-A1, p.2]

Biomass CO_2 “neutrality” is an inherent property of biomass based on the natural carbon cycle. The carbon dioxide (CO_2) removed from the atmosphere during photosynthesis is converted into organic carbon and stored in biomass such as trees and crops. When harvested and combusted or left to die and decay, the carbon in the biomass is released as CO_2 to be reabsorbed by replanted trees and crops, thus completing the carbon cycle.[1] [EPA-HQ-OAR-2010-0799-9537-A1, p.2]

The neutrality of CO_2 emissions from biomass combustion has been repeatedly recognized for many years by an abundance of studies and is widely accepted by agencies, institutions, regulations and legislation. This is true not only of the IPCC Guidelines and Guidance for the UNFCCC reporting protocols, but of innumerable other agencies and institutions as well. [EPA-HQ-OAR-2010-0799-9537-A1, p.3]

The globally accepted accounting practice for sovereigns of the UN Framework Convention on Climate Change Treaty, of which the United States is a signatory, is developed in the IPCC Guidelines of 1996 and 2006 and the Guidance of 2003 for Land Use/Land Use Change and Forestry (LULUCF). Unequivocally, in the 2006 IPCC Guidelines, Volume 1, Section 1.2, IPCC states that “CO_2 from the combustion or decay of short-lived biogenic material removed from where it is grown, is reported as zero in the Energy, Industrial Processes Product Use (IPPU) and Waste Sectors.” EPA, in preparation and submission of the United States annual inventory of GHG emissions and sinks adheres to these guidelines and does not report CO_2 from biomass combustion based on the same neutrality principle and accounting best practices in order to avoid double counting. [EPA-HQ-OAR-2010-0799-9537-A1, p.3]

Similarly, other countries and regional entities follow the same best practices. For example, the European Union Climate Change Trade Scheme in its directive on carbon trading, the European Union Emissions Trading Scheme (EU ETS), the EU Commission 2004 regulation in Section 4.2.2.1.6, Emission Factors, states, “Biomass is considered as CO_2-neutral. An emission factor of 0 [t CO_2/TJ or t or m3] shall be applied to biomass.” [EPA-HQ-OAR-2010-0799-9537-A1, p.3]

EPA confirmed its position that the combustion of biomass should be considered as CO_2-neutral, regardless of the source of the biomass, in its final rule to implement the Energy Independence and Security Act of 2007 through a new Renewable Fuel Standard, RFS2 (75 Fed. Reg. 14,669 (March 26, 2010)). The preamble of the final rule includes that “[f]or renewable fuels, tailpipe emissions only include non- CO_2 gases, because the carbon emitted as a result of fuel combustion is offset by the uptake of biogenic carbon during feedstock production". 75 Fed. Reg. at 14,787. [EPA-HQ-OAR-2010-0799-9537-A1, p.3]

Further, because CO_2 emissions from combustion of biofuels are widely considered neutral, they are either not reported or reported separately for information purposes only in many protocols such as U.S. Department of Energy's 1605(b), World Resources Institute/World Business Council for Sustainable Development, International Standards Organization 14064, IPCC, Environment Canada, U.S. EPA Climate Leaders, Midwest Greenhouse Gas Reduction Accord Advisory Board recommendations, and the final EPA Mandatory GHG Reporting Rule. In its Mandatory Reporting of GHGs Rule, U.S. EPA makes clear the exclusion of biomass CO_2 emissions quantities for the calculation of thresholds for determining regulated facilities. [EPA-HQ-OAR-2010-0799-9537-A1, p.3]

Distinguishing Between CO_2 Emissions from Vehicles Burning Biofuels and Those Burning Fossil Fuels Would Be Consistent with EPA's Motor Vehicle Endangerment Finding [EPA-HQ-OAR-2010-0799-9537-A1, p.4]

As noted above, a statutory prerequisite for EPA to impose emission limitations on motor vehicles is a finding that emissions of the pollutant from domestic motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare. See CAA section 202(a). EPA proposed those findings on April 24, 2009 (74 Fed. Reg. 18,886), and AF&PA filed extensive comments on that proposal on June 23, 2009. As we stated in our comments, the proposed findings failed to distinguish explicitly between CO_2-neutral emissions from cars using biofuels and emissions from cars using fossil fuels, even though the emissions inventories that EPA relied on were for CO_2 emissions from fossil fuels. The fact is, however, that the effects that EPA projected in its findings of endangerment and causation are all based on increases in the concentration of the GHGs, and primarily in the concentration of CO_2, in the global atmosphere that EPA described and predicted based on combustion of fossil fuels. [EPA-HQ-OAR-2010-0799-9537-A1, p.4]

To the extent that a motor vehicle's CO_2 emissions merely return CO_2 to the global atmosphere that was removed when the organic compounds used to power the vehicle were produced through plant growth, that motor vehicle would not contribute to an increase in the concentration of CO_2 in the global atmosphere and could not be said to cause or contribute to the effects EPA described in its endangerment finding. Distinguishing between motor vehicle tailpipe emissions of CO_2 generated by combustion of biofuels would recognize that those emissions do not contribute to the harm EPA is attempting to mitigate. It also would further EPA's stated goals of increasing the use of renewable fuels and reducing our nation's dependence on foreign oil by creating an appropriate incentive for car manufacturers to accommodate and encourage the use of biofuels. [EPA-HQ-OAR-2010-0799-9537-A1, p.4]

The Proposed GHG Tailpipe Standards Could Be Modified To Differentiate Biofuel CO_2 Emissions [EPA-HQ-OAR-2010-0799-9537-A1, p.4]

Recognition of the fundamentally different nature, with respect to climate change, of combustion of biofuels in motor vehicles could be accomplished within the general regulatory framework

EPA has already proposed. AF&PA and AWC are not experts in EPA regulation of motor vehicle emissions, and we must defer to others as to the feasibility and appropriateness of the detailed requirements EPA has proposed. We can say, however, that recognition of the fundamental difference between CO_2 emissions from biofuels and those from fossil fuels would be consistent with provisions that EPA has included in previous GHG tailpipe standards and in the Proposed Fuel Economy and Tailpipe Standards. [EPA-HQ-OAR-2010-0799-9537-A1, p.4]

For example, for alternative-fuel vehicles up through MY2015, EPA proposed as an incentive, a method of calculating vehicle CO_2 emissions that in effect exempts 85% of the CO_2 emissions from use of alternative fuels such as biofuels or natural gas. See 74 Fed. Reg. at 49,531-32. This has the effect of understating the actual CO_2 emissions, in order to encourage use of alternative fuels. While we still maintain 100% of the CO_2 emissions from biofuels should be credited, it is illustrative of the mechanisms that can be adopted. There are various other incentives and credits, in the MY 2012-2016 light-duty vehicle GHG program and in the proposed MY 2017-2025 program, that are intended to encourage manufacturers to use technology, or implement it early, that will reduce CO_2 emissions by reducing the amount of [fossil] fuel used. Without necessarily endorsing any particular approach, we note that EPA could adapt one or more of those mechanisms to recognize the distinction, in potential effect on global climate, of CO_2 emissions from motor vehicles burning biofuels.[2] [EPA-HQ-OAR-2010-0799-9537-A1, p.5]

In summary, the Proposed Fuel Economy and Tailpipe Standards as written fail to distinguish between CO_2 emissions from the combustion of biofuels in light-duty motor vehicles and emissions from such vehicles burning fossil fuels, despite EPA's recognition of that distinction in other contexts, and the approaches followed by many international bodies. EPA should consider how to acknowledge the fundamentally different character of CO_2 emissions from use of biofuels when setting standards for emissions of CO_2 from motor vehicles. [EPA-HQ-OAR-2010-0799-9537-A1, p.5]

---

1 - From a technical or scientific perspective, biomass CO_2 neutrality is independent of any consideration of material sustainability of the sources of biomass – the CO_2 released back to the atmosphere is the same CO_2 that was just recently removed or "sequestered" from it. The carbon in biomass will return to the atmosphere regardless of whether it is burned for energy or allowed to biodegrade. When we burn biomass for energy we are simply inserting a step in the cycle that allows us to recover usable energy that can displace fossil fuels. [EPA-HQ-OAR-2010-0799-9537-A1, p.2]

2 - Some have suggested that burning biofuels may indirectly increase atmospheric concentrations of CO_2 because of loss of forests that may accompany increased demand for biomass for fuel or because of other indirect effects. As explained in footnote 1 above, such concerns, even if they have some basis, do not contradict the scientific fact that combustion of biomass fuel merely completes the carbon cycle and returns to the atmosphere CO_2 that was removed from the atmosphere by the plant. And in any event, EPA decided not to attempt to address a similar, but more directly related, issue in order to further its goal of reducing fossil-fuel consumption, by choosing to treat electric vehicles in most cases as having zero CO_2

emissions, disregarding that CO_2 may be emitted where the electricity is generated. See 75 Fed. Reg. at 25,341. [EPA-HQ-OAR-2010-0799-9537-A1, p.5]

Organization: American Honda Motor Co., Inc.

6. Testing Fuel – E0:

Current fuel economy and GHG testing are conducted with E0 fuels. We understand that it is EPA's intention in future rulemaking to adopt E15 as its test fuel. If and when EPA changes the certification fuel to E15, Honda believes it is essential that an adjustment factor be added to the GHG and CO_2 calculations so that it does not become a de facto fuel economy and GHG stringency increase. [EPA-HQ-OAR-2010-0799-9489-A1, p. 5]

Organization:	American Petroleum Institute (API)

Comment on the Impacts of Changing Fuel Composition on Costs, Benefits, and Emissions

The EPA and NHTSA point to an unintended consequence relating to the overlay of a regulation setting future light-duty vehicle Corporate Average Fuel Economy (CAFE) standards overlay on top of the separately imposed Renewable Fuel Standards (RFS) program: The cross-subsidization of costly renewable fuels could eventually result in a reduction of total fuel consumption. A CAFE- induced reduction in total fuel consumption will result in more costly cross subsidy per gallon of fuel. A reduction in total fuel consumption will lead to increased biofuel content (percent volume) which could change the timing and impact the severity of blend wall constraints. EPA should recognize that the CAFE standards potentially run counter to meeting RFS mandates. [EPA-HQ-OAR-2010-0799-9469-A1, p. 13]

Organization: Clean Fuels Development Coalition (CDFC)

RECOMMENDED ACTIONS. The Agencies have proposed a rule with multiple, and potentially competing, objectives. Increasing fuel efficiency and reducing transportation sector petroleum use and carbon emissions, without compromising urban air quality, requires a balanced approach to both fuels and vehicles. In order to enable the most cost effective compliance with these important objectives, we respectfully recommend the following changes to the rule as it now stands: [EPA-HQ-OAR-2010-0799-9574-A3, p. 1]

1. Provide automakers with sufficient incentives to commit to aggressive flex fuel vehicle (FFV) production schedules post-MY2016, with robust credit trading mechanisms among vehicle classes and among the manufacturers themselves. FFV incentives should be on par with those provided by the Agencies to other fuel options incented by this rule, such as electric, CNG, and fuel cell-powered vehicles. [EPA-HQ-OAR-2010-0799-9574-A3, p. 1]

2. Properly credit ultra-low emissions, high octane, low sulfur ethanol blends' (E30+ blends) higher octane; power density; reduced carbon; and RVP control benefits in calculating both

Petroleum Equivalency Factor (PEF) and carbon reduction credits. [EPA-HQ-OAR-2010-0799-9574-A3, p. 1]

3. Acknowledge the importance of octane in achieving both fuel efficiency and carbon/criteria pollutant reduction, and E30+ blends' unique ability to transform an 84 sub-octane gasoline blend-stock into a high-quality, clean-burning 94 octane (AKI) finished fuel. [EPA-HQ-OAR-2010-0799-9574-A3, p. 1]

4. Give full weight to E30+ blends' ability to substantially reduce both PM and $PM_{2.5}$ emissions, including the associated toxic PAHQ emissions, and thus fairly credit their ability to protect against unintended urban air quality impacts. [EPA-HQ-OAR-2010-0799-9574-A3, p. 1]

6. Recognize ethanol's cost advantages compared to gasoline Aromatic Group Compounds, and the sufficiency of E30+ ethanol supplies over the term of this rulemaking to both reduce Aromatics Group Compounds, and increase U.S. gasoline octane levels, while helping to reduce automakers' costs of compliance (see Attachment J). [This attachment can be found in Docket number EPA-HQ-OAR-2010-0799-9574-A14] [EPA-HQ-OAR-2010-0799-9574-A3, p. 2]

7. Develop commercially practicable methods to measure actual usage of E30+ blends post-MY 2019, whether it be on-board diagnostic reporting, or other predictable, and transparent, macro-accounting procedures. [EPA-HQ-OAR-2010-0799-9574-A3, p. 2]

BACKGROUND. Since the enactment of the 1990 Clean Air Act Amendments (1990 CAAA), U.S. policymakers have recognized that U.S. transportation fuels policy should strive to preserve a careful balance between vehicles and the fuels that power them, as they are synergistic pieces of an integrated system. Requiring automakers (original equipment manufacturers, or OEMs) to improve vehicle hardware and engine technologies without at the same time requiring fuel providers to improve fuel quality would be bad policy, and could result in adverse unintended consequences that will ultimately undermine the important objectives of this rule. In particular, failure to upgrade fuel standards to replace Aromatic Group Compounds with Clean Octane alternatives will compromise the nation's petroleum use and carbon reduction goals, potentially resulting in increased ambient particulate matter ($PM_{2.5}$, a currently regulated pollutant whose constituents include ultrafine particulates, or UFPs). We believe it is of paramount importance for the Agencies to ensure that the final rule properly recognizes intermediate ethanol blends' ability to enhance gasoline octane levels, and significantly reduce emissions of carbon and criteria pollutants. In order to take advantage of ethanol's unique qualities, the Agencies must revise their proposed rule to incent the manufacture of FFVs after MY2016 and require fuel quality improvements as Congress intended. This will be the best way to maximize cost effective compliance with both fuel efficiency and carbon reduction goals, enable the introduction of higher octane in-use fuels, prevent adverse urban air quality impacts, and protect the public health and welfare as new engine technologies come to market. [EPA-HQ-OAR-2010-0799-9574-A3, p. 2]

THE AGENCIES HAVE REQUESTED COMMENT ON A NUMBER OF IMPORTANT ISSUES. We commend the Agencies for requesting comment on a number of key issues that deserve careful consideration for shaping the final rule. Since we note that the Agencies project a fleet-wide penetration rate of only 1% for plug-in and electric vehicles (PHEVs and EVs) by 2021, and 7% for hybrid electric vehicles (HEVs), we believe that liquid fuel- propelled spark-ignition vehicles will continue to dominate the U.S. transportation fuels sector for many years, perhaps decades. A 2010 National Research Council (NRC) study was cited in a GM/Coskata paper as concluding that “PHEVs will have little impact on oil consumption before 2030 because there will not be enough of them in the fleet. More substantial reductions could be achieved by 2050 but will reduce oil consumption only slightly more than can be achieved by just the hybrid vehicles (HEVs).”12 Therefore, we will focus our comments on the important role we believe E30+ blends can play in down-sized GDI vehicles with bundled advanced technology packages. (The page numbers below identify where in the rulemaking the captioned issue is raised by the Agencies.) [EPA-HQ-OAR-2010-0799-9574-A3, p. 5]

- P. 75335, IMPORTANCE OF OCTANE. As mentioned previously, we believe that octane should play an extremely important role in meeting the nation‘s transportation fuels sector goals between now and 2025 and beyond. There are critical differences between the Aromatic Group Compounds (Dirty Octane) and Clean Octane alternatives, involving a range of considerations including legal/statutory authority, technical/performance, and environmental/health criteria. In the process of finalizing this rule, we strongly recommend that the agencies avail themselves of the extensive body of third party scientific literature, including recent Society of Automotive Engineers (SAE) and other credible work that has been done on performance and emissions effects of E30+ blends compared to the different types of in-use gasoline. [See Attachment C in Docket number EPA-HQ-OAR-2010-0799-9574-A6.] Well respected experts such as Honda Motors, Delphi Powertrain, Oak Ridge National Laboratories, and Southwest Research Institute have published findings that contradict many of the conventionally accepted assumptions about higher ethanol blends‘ performance based on testing that has historically been conducted primarily by petroleum interests or affiliated entities. In particular, E30+ blends can help the OEMs more cost effectively comply with the new fuel efficiency rules, reduce transportation fuel carbon intensity and CO_2eq tailpipe emissions, improve advanced engine design performance, and achieve significant reductions in harmful pollutants. [EPA-HQ-OAR-2010-0799-9574-A3, p. 5]
- P. 74878, PETROLEUM EQUIVALENCY FACTOR FOR E30+ BLENDS. The Agencies state in footnote #56 that EPA is required to calculate fuel economy using DOE‘s Petroleum Equivalency Factor (PEF). We are concerned that DOE‘s simplistic approach to ethanol‘s PEF based only on energy density comparisons (e.g., dividing gasoline‘s 115,000 BTUs into ethanol‘s 76,000 BTUs) significantly and incorrectly penalizes ethanol when it comes to both petroleum displacement and, by extension, carbon reduction credit calculations. It is important that the Agencies recognize at least three distinct facts about ethanol‘s unique octane enhancement properties: 1) it has an octane rating as high, or higher, than Aromatic Group Compounds, which means that ethanol can reduce the catalytic reformer‘s significant gasoline and other product yield losses sufficiently to entirely offset its lower energy density (confirmed by the 2008 NREL/McKinsey linear program study cited below);32 2) its power density, chemical octane, superior octane sensitivity, and charge cooling effects help to further compensate for its energy density (BTU) shortcomings; [See Attachment C in Docket number EPA-HQ-OAR-2010-0799-9574-A6] and 3) as ethanol volumes increase in the future in

response to market-based signals, OEMs can optimize advanced engine designs for higher compression ratios and other modifications to take even greater advantage of ethanol's unique performance benefits. Taken together, these benefits result in a greater than 1:1 displacement effect from E30+ blend substitution for Aromatic Group Compounds. Another important factor that must be considered in any recalculation of ethanol's PEF is for the Agencies to recognize that as ethanol concentration increases, e.g., E30+ blends, depending upon base gasoline properties, ethanol's naturally lower Reid Vapor Pressure (RVP)34 begins to take over, which allows refiners and blenders to more easily control for RVP (one of EPA's targets in the anticipated Tier 3 rulemaking). In any case, E30+ blends significantly reduce a wide range of tailpipe emissions, including NO_x, CO, VOCs, weighted average MSATs, and PM/PN that far outweigh any evaporative emission increases. [See Attachment C in Docket number EPA-HQ-OAR-2010-0799-9574-A6] [EPA-HQ-OAR-2010-0799-9574-A3, p. 9]

- ENSURE FULL-SCOPE COST-BENEFIT ACCOUNTING FOR REPLACING DIRTY OCTANE WITH CLEAN OCTANE. To our knowledge, the last time EPA did a cost-benefit analysis of reducing Aromatic Group Compounds was in the 2007 MSAT rulemaking. At that time, EPA's model used crude oil price assumptions of approximately $20 a barrel, which is of course 80% lower than current prices, making the analysis of little value. (Aromatics prices are tied directly to crude oil costs. As crude oil costs have soared in recent years, Aromatics Group Compound costs have also escalated rapidly.) Another major assumption that skewed the 2007 analysis against the potential of E30+ blends to replace Aromatic Group Compounds was EPA's adherence to conventional wisdom as far as penalizing ethanol for its energy density and RVP properties. This resulted in EPA assuming that it took approximately 1.6 barrels of ethanol to replace 1.0 barrels of aromatics. In fact, E30+ blends' superior octane enhancement effects, and the RVP control tendencies of higher blends—coupled with the offsets that should be credited to them for their substantial tailpipe emissions reductions—should result in E30+ blends being credited for at least a one for one displacement of Aromatic Group Compounds.36 In addition to the enormous health cost savings, there are at least two other costs-benefit considerations worth mentioning. The first is to recognize that commercial technologies exist to upgrade Aromatic Group Compounds and divert them from the gasoline pool to the value-added petrochemical market. [See Attachment H in Docket number EPA-HQ-OAR-2010-0799-9574-A12] The second consideration anticipates a predictable defense from refiners as to why the gasoline Aromatic Group Compounds cannot be reduced, whatever their costs or health risks: the catalytic reformer is not only the source of aromatics, but also provides off-gas hydrogen used for other operations, such as diesel fuel desulfurization. We believe that the best response to this specious argument can be found in the previously mentioned 2008 NREL/McKinsey linear program study of U.S. refiners, which specifically addressed the issue: "The [Linear Programming] model also calculated the input costs for each scenario to account for changes in inputs (e.g., as the reformer and isomerization unit throughputs are reduced, additional hydrogen will have to be purchased)…We also verified that increases in the inputs required, specifically hydrogen, could be met without driving up the prices of the inputs." (Emphasis added.)38 [EPA-HQ-OAR-2010-0799-9574-A3, pp. 9-10]

- P. 75103, GHG – CAFE RULEMAKING CAN/SHOULD COMPLEMENT TIER 3 RULEMAKING. We note EPA's statement that for this analysis, they assume "…no effect on volumes of ethanol and other renewable fuels because they are mandated under the Renewable Fuels Standard (RFS2)…However, as a consequence of the fixed volume of renewable fuels mandated in the RFS2 rulemaking and the decreasing petroleum consumption predicted here, we anticipate that this proposal would in fact increase the fraction of U.S. fuel supply that is made up by renewable fuels. Although we are not modeling this effect in our analysis of this proposal, the Tier 3 rulemaking will make more refined assumptions about future fuel properties, including (in a final Tier 3 rule) accounting for the impacts of the LD GHG rule." Inasmuch as EPA wants to reduce gasoline sulfur content, achieve RVP control, and establish a pathway to reducing PM emissions from gasoline-powered vehicles, it makes sense for EPA to also strive for "increasing the fraction of U.S. fuel supply that is made up by renewable fuels."39 However, we would point out that moving U.S. ethanol production and use to the next level faces many challenges, most of which will not be solved by simple reliance on RFS2 (the volume targets of certain categories of which can be, and often are, significantly reduced by EPA edict due to supply shortfalls). Private sector capital investment has dried up due to uncertainty driven largely by Blend Wall constraints and elimination of longstanding public sector support for new entrants. Now that the ethanol industry's tax incentives and other support has ended, what is most needed is regulatory policy that sends market-based, technology-neutral signals to investors that Clean Octane alternatives can compete on a level playing field with the entrenched, higher cost, higher carbon intensity, and highly toxic Aromatic Group Compounds. This is what the Congress intended in the 1990 CAAA, and it is what would be best for the nation's economy, energy security, environment, and public health and welfare. We strongly recommend that EPA fully consider the substantial benefits E30+ blends would bring in terms of: 1) reducing gasoline sulfur levels (a combination of refinery adjustments and the sheer dilution benefits of replacing Aromatic Group Compounds with 30+% low sulfur ethanol; 2) helping to control RVP, while achieving major reductions in a host of tailpipe emissions; and 3) substantially reducing PM, and especially $PM_{2.5}$, and their associated PAHQ toxic emissions, even as the use of GDI engine technologies increases in the future. For the OEMs, and the entire nation, to extract full benefit from the use of these high-performance, low carbon intensity E30+ blends, it is imperative that the OEMs are properly incented to manufacture FFVs after MY2016. While FFV cost differentials will be considerably lower than CNG alternative vehicles and/or EVs/PHEVs, the OEMs must receive fair and balanced treatment if they are to make the level of commitment needed to ensure that American motorists are able to exercise "consumer choice" at the pump. This means that, over time, all vehicles should be capable of running on no less than E30+ blends, i.e., all FFVS. In the future, as more volumes of ethanol enter the marketplace—from a diverse range of sources, feedstocks, and technologies—the OEMs will be able to achieve even greater mileage efficiencies, performance enhancements, and carbon, PM, toxics, etc. reductions by committing to higher compression engines and other forms of optimization. They will not be able to make such a transition, however, unless FFVs are replacing older legacy vehicles as the fleet turns over. [EPA-HQ-OAR-2010-0799-9574-A3, pp. 10-11]

- P. 74878, FAILURE TO EXTEND PARITY TREATMENT TO FFVs. Regrettably, we note that the Agencies fail to treat ethanol‘s many Clean Octane benefits equitably compared to other alternatives, and to offer the OEMs parity treatment as it relates to incentives to manufacture FFVs compared to other types of vehicles. The Agencies state: “To facilitate market penetration of the most advanced vehicle technologies as rapidly as possible, EPA is proposing an incentive multiplier for compliance purposes of all electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCVs) sold in MYs 2017 through 2021.” (The Agencies are relying on at least one questionable assumption to justify the EV incentives, in that they have elected to assume no upstream carbon emissions from electricity generating units.)40 CNG vehicles are also being incented in this manner. However, in stark contrast, EPA proposes no such incentive multiplier for FFVs, even as it also proposes to eliminate the Usage Factor for all FFVs after MY2016. Consequently, the OEMs have no incentive to manufacture FFVs in the future, which will effectively cap the ethanol industry at its current levels, and thus unnecessarily, and unwisely, prevent the realization of the enormous economic, environmental/health, and energy security benefits that would accrue from an aggressive E30+ Clean Octane program. [EPA-HQ-OAR-2010-0799-9574-A3, p. 11]
- P. 75126, CO_2 REDUCTION BENEFITS AND THE SOCIAL COST OF CARBON. The expanded use of E30+ blends between now and 2025 would achieve substantial reductions in mobile source carbon emissions. EPA has confirmed that Aromatic Group Compounds are 20% more carbon intensive than gasoline itself, and that based on their molecular formulas, ethanol‘s carbon share (% mass) is approximately 40% less than Aromatic Group Compounds.41 In addition, an accurate assessment of the carbon reduction impacts of a Clean Octane fuel reformulation program would have to recognize that the combustion of Aromatic Group Compounds emit orders of magnitude more carbon (see Southern California Particle Center chart, Attachment I). In its December 7, 2011 Technical Support document on PM, CARB provided reinforcement for this assertion: “…[B]ased upon the SPN-EC correlation observed in this study, it is likely that the inclusion of a strict SPN standard would lead to reductions in EC (i.e., BC) emissions.”42 In a recent paper on BC properties, Sierra Nevada Research Institute noted that PAH isomers are a major source of urban BC (EPA‘s draft 2011 Report to Congress on Black Carbon stated that mobile sources are the source of approximately 60% of BC emissions in the U.S.), and that automobiles are a major source of PAH isomers.43 As noted above, the Agencies are proposing to generously incent manufacturers to build FCVs, even though their commercialization is still many years away, because they can utilize hydrogen, which is a fuel that contains no carbon, and therefore would theoretically have no CO_2eq emissions. Using the same logic, the Agencies should be eager to incent the manufacture of FFVs, which can be mass produced today, and which are required to enable increased use of a fuel which contains at least 40% less carbon than the compounds it replaces, and which is available in large quantities today.44 By facilitating the widespread availability of FFVs, the Agencies can remove one of the most formidable barriers to E30+ blends‘ commercialization. Increased use of such blends would help the OEMs by reducing compliance costs in meeting the rulemaking‘s 2025 goal of 163 g/mile of CO_2eq emissions, due to a combination of their lower carbon molecular composition, as well as their ability to substantially reduce high carbon intensity combustion byproducts . We believe that this rulemaking fails to properly

identify, and credit, E30+ blends' cumulative carbon effect. The leading alternatives to the Aromatic Group Compounds all have a much lower carbon intensity index than the high carbon content they would displace, as suggested by the estimates in the table below. [See table on p. 12 of Docket number EPA-HQ-OAR-2010-0799-9574-A3] [EPA-HQ-OAR-2010-0799-9574-A3, pp. 11-12]

- P. 75070, TECHNOLOGY PENETRATION AND ADOPTION RATES. We have already noted that a range of experts—the NRC, the Agencies, and the OEMs themselves—predict that technology adoption challenges will limit the penetration of EVs, PHEVs, HEVs, and FCVs well into the future. Meeting this rule's important objectives will require primary reliance on liquid fuels to power mostly SI engines, equipped with advanced engine technologies. Many of the SI engine technology advancements are expected to be adopted rapidly. For instance, the Agencies project that GDI advances will be incorporated into 85% of new vehicles by 2016, and 100% by 2020 and beyond. Properly incentivized, the OEMs could make most of their light duty fleet flex-fuel capable within a comparable time frame, as the technology is readily available, and the costs are relatively low. There are at least two separate considerations involved here. The first consideration: whether or not the final rule properly recognizes the value of E30+ blends in meeting the petroleum and carbon reduction goals, and therefore sufficiently incents the OEMs by way of Incentive Multipliers and/or Utility Factors to produce the FFVs needed to use the fuel. The second consideration: whether the OEMs realistically expect that sufficient volumes of ethanol will be made available in the coming years to make it worth their while to produce such vehicles, especially since by MY2019 they must demonstrate that the ethanol is actually being used for their credits to be earned? Recognizing that current U.S. ethanol production capacity already stands at one million barrels per day (bpd), we believe that this second question can be answered affirmatively. Using U.S. Energy Information Administration (EIA) numbers, we can paint the following picture of U.S. transportation fuel demand by 2025: [EPA-HQ-OAR-2010-0799-9574-A3, pp. 12-13]

1. 2009, 245 million LDVs on U.S. roads

2. Based upon VMTs, each vehicle averages approximately 12,000 miles/year, and 22.5 mpg

3. Prior to the Great Recession, fleet turnover averaged 7%/yr. (e.g., entire fleet turns over every 14 years)

4. Assume only 5.5% replacement rate going forward, with fleet growth only 1%/year, effective 2013

5. Implies average new vehicles sales of 16.4 million vehicles/year

6. Assume new vehicles hit the 49.6 mpg target by 2025

7. Means that total U.S. LDV fleet would be 276 million vehicles, with an average fuel economy of 36 mpg

8. Equals 2.6 million bpd reduction in U.S. motor fuel consumption [EPA-HQ-OAR-2010-0799-9574-A3, p. 13]

If the EIA assumptions are anywhere near correct, the U.S. transportation fleet crude oil demand picture is in for a major transformation over the next 10 – 15 years. EIA numbers for 2010 show U.S. gasoline consumption at just short of 9 million bpd, which includes ethanol's 900,000 bpd. Adjusting the 2.6 mmbpd figure downward to net out diesel use yields a net reduction in mogas (motor gasoline) usage of approximately 2 mmbpd. That would make 2025 U.S. gasoline demand only 7 mmbpd, of which 1 mmbpd would be comprised of U.S. corn ethanol (capacity already in place), leaving a net total of approximately 6 million bpd of U.S. gasoline demand in 2025. [EPA-HQ-OAR-2010-0799-9574-A3, p. 13]

That means if the goal is to have a flex-fuel transportation system in place by 2025 that would accommodate a national average of E30+ blends, the U.S. would require only 2.1 million bpd of ethanol. This translates into an increase in ethanol supplies of only slightly more than double 2012's 1 million bpd of ethanol production capacity over a period of 13 years. To put this into perspective, the U.S. ethanol industry tripled its production capacity between 2005—the year RFS1 was signed into law—and 2011, or in only six years. Even with the recent elimination of ethanol tax incentives and import duty protections, the market-based signals of a properly drawn rule would unleash the private sector energies of scientists, investors, and feedstock producers to tap into a wide range of sources, technologies, and feedstocks. [See Attachment J in Docket number EPA-HQ-OAR-2010-0799-9574-A14] [EPA-HQ-OAR-2010-0799-9574-A3, p. 13]

The table in Attachment J provides a snapshot of how market-based regulatory signals could successfully balance a gradual reduction in gasoline Aromatic Group Compounds levels with a gradual ramp-up in ethanol levels, until the U.S. has reached a sustainable "equilibrium" of nationwide E30+ blends in 2025. [See Attachment J in Docket number EPA-HQ-OAR-2010-0799-9574-A14] [EPA-HQ-OAR-2010-0799-9574-A3, p. 13]

The graph attached to the table shows how U.S. fuel providers can actually REDUCE (Aromatic Group Compounds), REPLACE (with E30+ blends), and INCREASE (the U.S. transportation sector octane pool in the process). Such an outcome is achievable, so long as the Agencies adequately incent FFV manufacture in this rulemaking, and require higher quality fuel standards here and in the upcoming Tier 3 rule. [EPA-HQ-OAR-2010-0799-9574-A3, p. 14]

The primary assumptions are set out in the Key Market Driver Criteria column. They include the following:

- The fuel efficiency rules will reduce U.S. mogas consumption to 7 mmbpd by 2025
- This means that by 2025, U.S. ethanol use must reach approximately 2.1 mmpbd, or slightly more than double current production capacity of 1 mmbpd over the next 13 years
- That 84 sub-octane blend-stocks average approximately 10 volume % Aromatic Group Compounds
- That E30+ blends, when added to 84 sub-octane gasoline, result in a high quality finished gasoline of approximately 100 RON (for GDI engines)

- That ethanol will displace Aromatic Group Compounds on a one to one, gallon for gallon, basis, based upon its ability to reduce gasoline yield loss at the refinery; the RVP control benefits of higher levels of ethanol in E30+; the de minimus mileage penalty that could occur with E30+ blends (vs. E85), even before the OEMs are able to employ optimization techniques, such as increased compression; and the additional miscellaneous benefits of ethanol‘s increased power density, chemical octane response, and charge cooling effects. [EPA-HQ-OAR-2010-0799-9574-A3, p. 14]

Finally, we are also confident that the nation‘s fuel distribution infrastructure can keep pace with the FFV manufacturing schedule and the expansion of next-generation ethanol production. Based upon typical turnover rates for the nation‘s gasoline dispensers, if flex fuel dispensers were as a matter of course substituted as the obsolescent dispensers are phased out (such as has been proposed by Senate Energy and Natural Resources Committee Chairman Bingaman), the entire U.S. fleet and fuel dispenser system could be flex-fuel compatible by 2025. Consumers would be empowered to save billions of dollars on their fuel purchases by having the freedom to select which blend of gasoline and ethanol best suited their preferences, depending upon cost considerations, environmental impacts, and energy security concerns. Especially when compared to the formidable infrastructure and logistical challenges of some of the other alternatives, such as electric and CNG vehicles, transitioning to an ethanol flex fuel system can be done smoothly, cost effectively, and well within the time frame envisioned by the rule. [EPA-HQ-OAR-2010-0799-9574-A3, p. 14]

CONCLUSION. We respectfully urge the Agencies to make every effort to ensure that the final GHG – CAFE rule does not—in its pursuit of important petroleum and carbon reduction goals—inadvertently create air quality impacts that compromise the public health and welfare, especially that of our most vulnerable citizens living in our largest cities. Congressional intent in the 1990 CAAA is unmistakably clear: the U.S. transportation fuels sector must be managed as a synergistic whole, with vehicles and fuels carefully balanced and periodically aligned as the science advances and technological opportunities present themselves. This rule will shape the U.S. transportation fuels sector for decades to come and has the potential to make dramatic contributions to the nation‘s economic, energy security, environmental, and health and welfare goals. Failure to act now to match improved fuel standards with improved vehicle technologies will unnecessarily expose an entire generation of Americans to increased emissions, especially particle-bound toxics, substantially increase the nation‘s health care costs, and represent a missed opportunity of enormous proportions. In order to open the door to take full advantage of the many benefits of E30+ Clean Octane blends, it is imperative that the Agencies extend equal treatment to FFVs compared to electric, fuel cell, and CNG vehicles. The OEMs must be adequately incented to manufacture FFVs in the future. If they do not, ethanol use will be effectively capped at current levels, and the enormous benefits of a nationwide Clean Octane program will never be realized. [EPA-HQ-OAR-2010-0799-9574-A3, p. 14]

12 “Ethanol – the primary renewable liquid fuel,” Datta et al., J Chem Technol Biotechnol 2011; 86: 473-480.

32 http://www.nrel.gov/analysis/pdfs/44517.pdf, pp. 17 – 19. Specifically, as shown by the McKinsey linear program models, E30+ blends would provide sufficient octane clout to reduce refinery gasoline yield loss by approximately 9.9%, which effectively negates the mileage penalty predicted for E30+ blends. (The Agencies assume that E85 blends will result in 27% lower mileage, based on BTU calculations, although real-world mileage losses have been shown to be considerably lower. E30+ blends‘ mileage performance (assuming no engine optimization) should thus be approximately one-third of that, or 9 – 10% lower. See also Footnote #30.)

34 When not blended with gasoline, ethanol has an RVP of slightly more than two pounds.

36 For the reasons set forth in Footnote #25 above, we would respectfully suggest that now might be an excellent time for EPA to re-run the 2007 MSAT cost-benefit model using more current EIA oil price projections, and recognizing the 1:1 displacement factor for ethanol and Aromatic Group Compounds.

38 "2.4.2 Findings: As the percentage ethanol with which the CBOB will be blended increases, the share of naphtha in the CBOB increases, while the share of isomerate and reformate decreases…Overall, we found that refiners producing fossil gasoline for…E20 blending, the fossil gasoline yield goes up by…6.7 percent…we found that gasoline prices at the pump could fall to…2 to 5 cents… (Footnote 27: The increased gasoline yield is the result of reduced throughput in the reformer. A secondary effect of backing down the reformer is reduced production of hydrogen, which is required for desulfurization of diesel. For most refineries, this will not be a problem as they typically have access to hydrogen produced from natural gas.)" pp. 18-19. http://www.nrel.gov/analysis/pdfs/44517.pdf

40 A stark example of this unbalanced treatment is the EPA‘s provision of an advanced technology vehicle incentive in the form of a 0 g/mile compliance value for MYs 2017 and later electric operation. This 0 g/mile assumption was retained despite opposition from some quarters during the run-up to the proposed rule. In the September 2010 Interim Joint Technical Assessment Report for this rulemaking, the Agencies noted that "[s]ome environmental and public interest groups expressed concern that the 0 g/mi value does not adequately capture upstream emissions from the charging of electric vehicles, and believe an upstream emissions factor should be included." Pp.5-6. In contrast, the ethanol industry has been subjected to rigorous upstream and downstream lifecycle analyses, including applying international Indirect Land Use penalties, while other fuels, such as tar sands and oil shale, have been exempted from such considerations.

41 See "Final Rule for Mandatory Reporting of Greenhouse Gases," Technical Support Document, Climate Change Division, U.S. EPA, September 15, 2009, pp. 15, 32. http://www.epa.gov/climatechange/emissions/downloads09/documents/SubpartMMPr

42 http://www.arb.ca.gov/regact/2012/leviiighg2012/levappp.pdf, p. 126

43 "Black Carbon‘s Properties and Role in the Environment: A Comprehensive Review", Shrestha et al., Sustainability 2010, 2, 204-320;doi:10.330-/su2010294, p. 5.

44 Some experts have argued that next-generation cellulosic ethanol‘s reduced carbon footprints closely resemble the net carbon reduction benefits that have been attributed to the use of hydrogen in fuel cell-powered vehicles.

Organization: E100 Ethanol Group

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p.202; pp. 204-206 and 226-227.]

In conclusion, our proposal: These standards for 2017-2025 are very strong and they are exceptionally well-written. We want to compliment the people who wrote the standards. So let's keep them in place exactly as written but apply them to only 50 percent of new light-duty vehicles.

For the other 50 percent, mandate E100 flex-fuel vehicles with strict mileage requirements.

Taking these two steps will assure complete independence of imported crude oil for the United States and lower greenhouse gas emissions far below the 2017 to 2025 standards.

What would be a viable strategy to make the U.S. independent of imported oil? E100 flex-fuel vehicles optimized to run on ethanol, not gasoline, are the most straightforward ways to do this.

Brazil did something similar to this several years ago and is now a net crude oil exporter, not an importer. The picture in front of you is of a pump at a Shell gas station in Sao Paulo, Brazil I took last April. Two grades of gasoline, regular and premium, and one grade of straight ethanol, no gasoline.

75 percent of the millions of light-duty vehicles in Brazil can burn this gasoline-free ethanol.

We use 140 billion gallons of gasoline per year. Roughly half, 66 billion gallons, come from imported crude oil. So to make the United States independent of imported oil, we need to replace 66 billion gallons of gasoline.

The fastest, lowest cost way to do this is to make ethanol a primary motor fuel in the United States, not a blend with gasoline, but a primary motor fuel for just half of all new vehicle inventory, 50 percent. E100 vehicles could still burn gasoline, but since ethanol would cost less than gasoline at the pump and since mileage would be better, consumers would flock to these vehicles.

E100 engines are applicable to all size vehicles, not just small ones. Cost may be $100 more per vehicle. The industry could easily be making 6.5 million such vehicles per year by January 1st, 2017. 10 years of doing this and now we have 65 million vehicles not burning gasoline, that makes a tremendous dent in the problem.

This ethanol will come from waste cellulose or municipal solid waste, not corn. The Department of Energy published a report that incontrovertibly proves that there is a billion tons of waste cellulose accessible every year in the Unites States.

Yield is 100 gallons per ton so we could make 100 billion gallons of ethanol without interfering with food production or agricultural exports. This is more than enough to provide crude oil independence. So for this and carbon already above ground to make this ethanol, not bringing up new carbon from underground, the net addition of CO_2 in the atmosphere with E100 is zero.

Basically what we're saying is at least mandate 50 percent of the vehicles run on straight ethanol; the other 50 percent continue with electric cars, fuel cells and everything.

We shouldn't just settle on gasoline and electric. It's too dangerous to put all our eggs in one basket.

Organization: Ford Motor Company

Flexible Fueled Vehicles: Consistent with the goals of helping America reduce its dependence on oil and reducing harmful pollution, incentives need to be continued for flexible fuel vehicles that can operate on alternative and renewable fuels. The federal 2007 Energy Independence and Security Act requires increasing use of renewable fuels through the Renewable Fuel Standard (RFS). While currently the volume requirements can be absorbed by blending up to 10% ethanol in the base gasoline available to conventional vehicles, very soon the mandated volume requirements will exceed that level as we proceed into next year. By 2022, the increasing RFS requirement will rely heavily on the ability of flexible fueled vehicles, capable of operating on gasoline blends containing up to 85% ethanol (E85), or other capable vehicles. These vehicles will be required in order to consume the mandated renewable fuel volumes that exceed what can be absorbed in the 10% ethanol blended gasoline, and which could be in excess of 20 billion gallons of ethanol, as demonstrated on the chart, below: [The chart can be found on p. 20 of Docket number EPA-HQ-OAR-2010-0799-9463-A1] [EPA-HQ-OAR-2010-0799-9463-A1, pp. 19-20]

The benefits of ethanol are well known. Argonne National Laboratory and EPA both show/confirm that on a Life Cycle Analysis basis, ethanol produces less GHG than gasoline (M. Wang, December 2010). Furthermore, cellulosic ethanol promises much larger CO_2 reductions. Based on these benefits, we strongly believe that the vehicles designed to operate on ethanol blends up to 85% should continue to receive an incentive to help offset the costs associated with the technology and calibration development. Therefore, we support the determination of credits based on national E85 usage. We look forward to working with the agencies to determine the most appropriate pathway forward to acknowledge the synergistic benefits of these technologies. [EPA-HQ-OAR-2010-0799-9463-A1, p. 20]

Organization: General Motors Company

GM supports the continuation of the quantification of CO_2 emissions reduction related to ethanol usage based on national E85 actual usage. We further urge the agencies to publish F-factor guidance, as suggested in the Alliance comments, as soon as possible to provide the basis for continued and further development of E85- capable vehicles. [EPA-HQ-OAR-2010-0799-9465-A1, p. 3]

Organization: Growth Energy

In the RFS 2 regulation, and consistent with EISA, EPA chiefly relies on the production and sale of domestically-produced ethanol and flexible fuel vehicles (”FFVs”) to meet the volumetric renewable fuels requirements now codified in section 211(o)(2)(B) of the Clean Air Act. The volumetric requirements were fully considered by Congress, were adopted by strong bipartisan majorities, and have been and remain provisions of the statute that representatives of the fossil fuel industry do their best to undercut. See, e.g., Nat'l Petrochemical & Refiners Ass'n v. EPA, 630 F.3d 145 (D.C. Cir. 2010) (denying petitions for review). EPA has a duty to carry out EISA’s mandates, and other federal agencies have provided strong financial support with public funds authorized by Congress to promote the development of biofuels. Growth Energy’s members have invested heavily in the production of renewable fuels, including cellulosic biofuels, and Growth Energy has been a staunch defender of the RFS requirements in EISA. [EPA-HQ-OAR-2010-0799-9505-A1, p. 3]

The GHG and fuel economy standards that the Agencies are now proposing will define, far more than any other step that the Agencies can take under federal law, the types of vehicles that the automobile industry will produce for many years into the future. EPA, however, has not reconciled the options presented for vehicle manufacturers under the regulations proposed in the Joint NPRM with the requirements of Title II of EISA and the strategy for achieving the volumetric requirements of Title II in the RFS 2 regulations. If the GHG reductions that FFVs can be expected to achieve when operated on renewable fuels are not translated into practical incentives for vehicle manufacturers to continue and expand production of FFVs, then the volumetric requirements in Title II of EISA will not be achieved. The Joint NPRM does not propose any program that provides vehicle manufacturers with the necessary incentives, and indeed seems to disfavor the use of ethanol as a vehicle GHG reduction strategy in comparison with a fossil fuel (natural gas) and electricity. This important issue is examined in Attachment 2 [pp. 16-21 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] to this letter, which also introduces concepts that could bring EPA’s vehicle-based GHG reduction goals back into line with EISA and the RFS 2 regulation. [EPA-HQ-OAR-2010-0799-9505-A1, p. 3]

The problem is not simply that EPA has neglected biofuels in the Joint NPRM. EPA and NHTSA are instead embarking on a course that will make the volumetric biofuels requirements of Title II in EISA unachievable. Vehicle manufacturers operate in a highly competitive environment, face a complex set of regulatory expectations from EPA, NHTSA, and the State of California, must plan their compliance strategies many years before the start of a given model year, and have no resources to waste on programs that will not help ensure regulatory compliance. The Joint NPRM is rooted in the policy preference of one State (California) for electric vehicles, and EPA has bifurcated this rulemaking from other emissions and fuels rulemakings. The Joint NPRM leaves no room for vehicle manufacturers to rely on biofuels and the mandates in Title II of EISA as part of an overall compliance strategy. [EPA-HQ-OAR-2010-0799-9505-A1, p. 3]

Notably, EPA does not try to explain in the Joint NPRM or in its regulatory support document why and how it thinks the program outlined in the Joint NPRM will ensure compliance with Title II of the 2007 Energy Act. Nor does the Agency claim, nor could it claim in light of the scope and duration of the standards outlined in the Joint NPRM, that any steps that EPA might take in future regulations under the Clean Air Act could address the conflict between its currently proposed prescriptions to the automobile the Joint NPRM, the guiding strategy appears to have been brokered with California, and not to have been based on the requirements of federal law. 1 If EPA does not correct the direction it is now setting for the automobile industry with respect to FFVs, there will be few FFVs produced after MY 2016. And, in the absence of a large and growing fleet of FFVs, the volumetric mandates in Title II of EISA cannot be met. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 3-4]

Given the neglect of the RFS 2 program in the current rulemaking, EPA appears to be setting the RFS 2 program on a course that is quite contrary to what Congress expected in EISA. That is completely unnecessary, because all EPA has to do in this rulemaking is to give vehicle manufacturers practical incentives for continued and expanded production and sale of FFVs that would be based on the volumes of biofuel required by Congress. EISA includes provisions allowing EPA to make adjustments in the RFS 2 program, if there are proper determinations of unforeseen, “severe” economic harm, “severe” unintended environmental impacts, or an “inadequate domestic supply” of biofuels. See 42 U.S.C. § 7545(o)(7)(A),(F). But those provisions merely provide narrowly-drawn “off-ramps” for the renewable fuels program to address paramount economic or environmental interests. They are hardly a license for EPA to set the RFS 2 program up for failure. It would be ironic in the extreme, and contrary to law, if regulations adopted by EPA in the exercise of administrative discretion, like the regulations in the Joint NPRM, were to deprive the nation of an adequate supply of biofuels, and thus to provide a pretext to abandon or curtail the requirements of Title II in EISA. [EPA-HQ-OAR-2010-0799-9505-A1, p. 4]

When it enacted EISA, Congress had lengthy experience with the efforts of the fossil fuel industry to retard the use of non-fossil fuels, and with the fossil fuel industry’s history of resistance to regulation under the mobile-source provisions of the Clean Air Act. Congress therefore spoke with clarity about its expectations for the volumetric requirements for biofuels in Title II of EISA. EPA was directed in mandatory terms to adopt regulations to “ensure” the sale of gasoline with the specified volumes of biofuels. See 42 U.S.C. § 7545(o)(2)(A) (the Administrator “shall” adopt regulations “to ensure” the use of specified volumes of biofuels). The only federal court that has needed to construe this provision has stated that the term “ensure” as used in EISA means “to make sure, [or] certain.” Nat'l Petrochemical & Refiners Ass'n, supra, 630 F.3d at 153 (internal quotation marks and citations omitted); see also Nat'l Treasury Employees Union v. Chertoff, 452 F.3d 839, 863 (D.C. Cir. 2006) (construing “ensure” under other statute as mandatory). Congress has left EPA no room to effect a de facto reduction in the domestic supply of biofuels when EPA adopts other regulations. EPA must “obey the Clean Air Act as written by Congress.” Natural Resources Defense Council v. EPA, 643 F.3d 311, 314 (D.C. Cir. 2011) (internal quotation marks and citation omitted). [EPA-HQ-OAR-2010-0799-9505-A1, p. 4]

As noted above, Attachment 2 to this letter provides further analysis of the treatment of FFVs in the current rulemaking. If EPA decides not to reform the program outlined in the Joint NPRM to conform with and to support the RFS 2 program, EPA must at a minimum address fully and in detail each of the following questions, in order to explain why it has not done so: [EPA-HQ-OAR-2010-0799-9505-A1, p. 4]

- EPA should explain how it expects the automobile industry and fuels providers to meet the RFS 2 requirements within the framework of the regulations contained in the Joint NPRM or in the Final Rule it adopts in this rulemaking;
- If EPA disagrees with Growth Energy's view that it is unrealistic to expect continued significant production of FFVs after model year 2016 if the Joint NPRM's provisions are adopted, the Agency should explain why;
- EPA should explain how it interprets the requirement to "ensure" the use of biofuels under the statutory text of EISA (see 42 U.S.C. § 7545(o)(2);
- EPA should explain how the vehicle production plans and strategies assumed in the regulatory analysis for the Joint NPRM will "ensure" that the country can meet the volumetric mandates for biofuels in Title II of the 2007 Energy Act;
- If EPA believes that it is not obligated in the current rulemaking to take account of and comply with its duty to ensure compliance with the biofuels mandate in EISA, EPA should explain why it is not required to do so.; and
- EPA should explain whether the absence of an adequate domestic supply of biofuels arising from reductions in the production and sale of FFVs could provide, in whole or in part, a basis of a waiver of any part of the biofuels mandate in EISA. [EPA-HQ-OAR-2010-0799-9505-A1, p. 5]

Because such an increase in octane cannot be accomplished by increases in gasoline aromatic content without compromising the control of emissions other than GHG emissions, EPA should evaluate increases in octane that rely on increases in ethanol content. Increased ethanol content for gasoline to obtain higher octane levels, implemented in a manner consistent with the product planning and validation cadences of the automobile industry and without disruption to existing liquid transportation fuels delivery systems, would have a number of benefits for the public. By enabling a greater mix of engine technologies to meet GHG reduction requirements on a fleet-wide basis, the automobile industry might be able to reduce the costs of GHG reductions. Carefully managed increases in ethanol content can also help reduce engine particulate emissions. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 5-6]

EPA's proposed greenhouse gas (GHG) emissions standard in the Joint Notice of Proposed Rulemaking provides incentives for electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs) and fuel cell vehicles (FCVs), but essentially eliminates incentives for flexible fuel vehicles (FFVs). The incentives have no clear foundation in a relative comparison of the overall GHG emissions or costs of each of these vehicles. EPA should undertake a thorough study of the lifecycle emissions and total costs, including the cost of the refueling infrastructure of these vehicles, in determining incentives. [EPA-HQ-OAR-2010-0799-9505-A1, p. 7]

The fact that vehicles operating on ethanol-blends can deliver significant GHG benefits can be seen in the results of numerous studies. One straightforward study is a summary of "well to wheels" analysis results published by the U.S. Department of Energy. Selected results from this publication are summarized in Table 1. [Table 1 can be found on p. 10 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, pp. 8-9]

There are several conclusions that can be drawn from the data shown in Table 1. The first of these is that the use of E85 derived from corn6 or from cellulosic materials will reduce GHG emissions by about 11% and 60%, respectively, relative to gasoline without the need for any substantial change in a given vehicle technology. The second is that the use of E85 in hybrid vehicles in the near term will result in substantially larger reductions relative to gasoline than will EVs, PHEVs, and FCVs. The third is that the use of E85 derived from cellulosic feedstocks in any FFV will yield larger reductions in GHG emissions than will be achieved with EVs, PHEVs, or FCVs. [EPA-HQ-OAR-2010-0799-9505-A1, p. 9]

These data and similar data from other related studies, clearly indicate the potential for ethanol-blends to provide "game-changing" reductions in GHG emissions without the need for the fundamental changes in vehicle technology associated with EVs, PHEVs, and FCVs or the fundamental changes in the technology used to generate electricity and hydrogen that would be necessary in order for these vehicles to provide meaningful GHG reductions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 9]

Further evidence of the inappropriateness of providing incentives for EVs, PHEVs, and FCVs while failing to do so for vehicles capable of operation on ethanol blends can be seen through even a cursory examination of the costs associated with these vehicles, their fuels, and the infrastructure required to supply those fuels. [EPA-HQ-OAR-2010-0799-9505-A1, p. 10]

Beginning with vehicle costs, as noted in the EPA proposal, "owners of ethanol FFVs do not pay any more for the E85 fueling capability" that affords the potential for "game-changing" reductions in GHG emissions. In contrast, although misguided subsidies and incentives may affect the prices consumers pay, the actual incremental costs at a retail cost level for EVs, PHEVs, and FVCs during the 2017 to 2025 time frame are expected to be thousands to tens of thousands of dollars. That this will be the case can be easily seen in Table 2 presented below which is taken (along with original footnotes) from a recently released California Air Resources Board (CARB) rulemaking document. As shown, incremental costs for even subcompact vehicles in 2025 are forecast by CARB to remain at levels from around $7,500 to $11,000. This means that unlike the case with vehicles capable of operation on ethanol-blends, substantial costs will have to be incurred before EVs, PHEVs, and FCVs can even be hoped to be capable of providing "game-changing" reductions in GHG emissions. [Table 2 can be found on p. 11 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, pp. 10-11]

Turning to the costs of fuel, the production costs of ethanol are well known for corn derived ethanol and production costs for much lower carbon intensity ethanol produced from cellulosic sources are ultimately expected to be similar or lower than those associated with production from corn. The price of E85 and gasoline is expected to be similar to or lower than those associated with petroleum based fuels over the 2017 to 2025 period based on the latest fuel price forecasts from U.S. Energy Information Administration (EIA). Therefore, it does not appear that there will be a significant fuel price related disincentive to operate FFVs on fuels other than E85. Moreover, as RFS volumes are ramped-up, as discussed in the next section, the additional ethanol beyond E10 will need to go into the available on-road FFVs. Therefore, ethanol vehicles do not have to overcome either vehicle price or fuel price barriers in order to provide "game-changing" reductions in GHG emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 12]

Turning finally to the cost of refueling infrastructure, there will be costs associated with the development of a widespread distribution infrastructure for higher ethanol blends. However, that infrastructure will be integrated into the existing transportation fuel infrastructure in the U.S. and not require revolutionary changes to that infrastructure. Further, as ethanol blends will displace petroleum fuels, the capacity of the existing infrastructure will remain relatively constant. [EPA-HQ-OAR-2010-0799-9505-A1, p. 13]

In contrast, EPA has elected not to provide to incentives for vehicles capable of operating on ethanol blends despite the fact that they can provide "game changing" reductions in GHG emissions by being used in what are essentially conventional vehicles with little incremental cost for either the vehicles or the fuels using an existing refueling infrastructure that needs only to be modified to a fairly limited degree. [EPA-HQ-OAR-2010-0799-9505-A1, p. 15]

Given the above, it is clear that EPA's policy on providing incentives under the GHG regulation makes little sense and must be modified to provide incentives for the use of ethanol blends that are at least commensurate with those provided with much less certain and much more expensive technologies. [EPA-HQ-OAR-2010-0799-9505-A1, p. 15]

EPA's current GHG proposal would have the effect of eliminating any meaningful incentives for vehicle manufacturers to produce flexible fuel vehicles (FFVs) capable of operation on both gasoline and ethanol for the 2016 and later model years. FFVs are the backbone of the federal Renewable Fuel Standard (RFS), as they are expected to consume most of the ethanol that is produced to meet the RFS after the onroad fleet is all operating on E10, a blend of 90% gasoline and 10% ethanol by volume. One important goal of the RFS program is to help the United States do its part to control GHG emissions. If vehicle manufacturers stop selling FFVs after 2016, the GHG benefits of the RFS program will be lower than currently anticipated. To address this potential problem, Growth Energy recommends that EPA/NHTSA develop and permit the use of E85 "usage factors" for FFVs utilizing volumes of ethanol projected by the U.S. Energy Information Agency, so that vehicle manufacturers can decide when developing their product plans whether to provide FFVs, and to create incentives for the manufacturers to do so. In these comments, we lay out a reasonable method of projecting these usage factors. [EPA-HQ-OAR-2010-0799-9505-A1, p. 16]

FFVs typically have GHG emissions on E85 that are approximately 5% below the GHG emissions on E0, but this can vary between 3-6%. [EPA-HQ-OAR-2010-0799-9505-A1, p. 16]

Automakers currently sell FFVs because they receive fuel economy and GHG credits for these vehicles under EPA/NHTSA credit provisions, at least through model year 2015. Automakers can receive up to 1.2 miles per gallon in fuel economy credit against the applicable NHTSA

CAFÉ standards through 2014. After 2014, this credit declines by 0.2 mpg per year until it is fully phased out in 2020. [EPA-HQ-OAR-2010-0799-9505-A1, p. 16]

EPA's GHG emission standards between 2012 and 2015 are consistent with the NHTSA fuel economy credit. EPA's current rules for GHG emissions for 2016 model year FFVs, and its proposal for 2017 and later FFVs are found in the following discussion: [EPA-HQ-OAR-2010-0799-9505-A1, p. 16]

Beginning in MY 2016, EPA ended the GHG emissions compliance incentives and adopted a methodology based on demonstrated vehicle emissions performance. This methodology established a default value assumption where ethanol FFVs are operated 100 percent of the time on gasoline, but allows manufacturers to use a relative E85 and gasoline vehicle emissions performance weighting based on either national average E85 and gasoline sales data, or manufacturer-specific data showing the percentage of miles that are driven on E85 vis-à-vis gasoline for that manufacturers' ethanol FFVs. EPA is not proposing any changes to this methodology for MYs 2017-2025. [EPA-HQ-OAR-2010-0799-9505-A1, p. 17]

Regarding current national average E85 use by FFVs, EPA states:

The data confirm that, on a national average basis for 2008, less than one percent of the ethanol FFVs used E85. [EPA-HQ-OAR-2010-0799-9505-A1, p. 17]

The reason for the low adoption rate of E85 is that the E10 market was the first to consume all the available ethanol. Only now do we have more ethanol supply than is needed for E10 demand, so adoption rates should increase. [EPA-HQ-OAR-2010-0799-9505-A1, p. 17]

The vast majority of FFVs are sold to the general public (and not fleets that may have more control over fuel type), and it would be very difficult for manufacturers to determine the fraction of use on E85 for these vehicles. Under either current EPA requirements for 2016 vehicles or the proposed EPA requirements for 2017 and later vehicles, manufacturers would have to certify FFVs on 100% gasoline, or under the EPA proposal, use some national average E85 use, which as EPA indicates is still quite low. Since FFVs have a non-zero cost, but are assumed to have zero or very near zero benefit under either California or EPA requirements, the chances of automakers providing FFVs after 2016 is also zero, or near zero. [EPA-HQ-OAR-2010-0799-9505-A1, p. 17]

EPA expected that when they required model year 2016 FFVs to demonstrate use on E85, that this would provide incentive for automakers to optimize their FFVs on E85: However, if a manufacturer can demonstrate that a portion of its FFVs are using an alternative fuel in use, then the FFV emissions compliance value can be calculated based on the vehicle's tested value using the alternative fuel, prorated based on the percentage of the fleet using the alternative fuel in the field….EPA believes this approach will provide an actual incentive to ensure that such fuels are used. The incentive arises since actual use of the flexible fuel typically results in lower tailpipe GHG emissions than use of gasoline and hence improves the vehicles' performance, making it more likely that its performance will improve a manufacturers' average fleetwide performance. Based on existing certification data, E85 FFV CO_2 emissions are typically about 5 percent lower on E85 than CO_2 emissions on 100 percent gasoline. Moreover, currently there is little incentive to optimize CO_2 performance for vehicles when running E85. EPA believes the above approach would provide such an incentive to manufacturers and that E85 vehicles could be optimized through engine redesign and calibration to provide additional CO_2 reductions. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 17-18]

Manufacturers typically utilize at least a four-year lead-time in designing vehicles, therefore, in 2012 most manufacturers are working with the 2016 model year. While such an approach as outlined by the EPA above could provide incentive for manufacturers to optimize 2016 model year FFVs on E85, if they have no idea or guidance from the EPA what E85 use could be in 2016, and current use is close to zero, then it does not matter how much they optimize FFVs on E85, a larger GHG benefit times a current zero usage factor is still zero. [EPA-HQ-OAR-2010-0799-9505-A1, p. 18]

While current E85 refueling frequencies are quite low, EPA is counting on FFVs to use a significant amount of E85 due to the Renewable Fuel Standard requirements, which expand biofuel use in the U.S. to 36 billion ethanol equivalent gallons per year by calendar year 2022. EPA projected a range of ethanol volumes in the RFS, a “low”, “mid” and “high”. Figure 1.7-11 from the RFS Regulatory Impact Analysis shows necessary FFV E85 refueling rates in the future with the RFS. In 2016, FFV E85 refueling rates are between 38% and 55%, and increase to 40% to 70% by 2020. [EPA-HQ-OAR-2010-0799-9505-A1, p. 18]

The E85 refueling rates shown in Figure 1 were estimated by EPA with the 2012- 2016 GHG emission standards, but without the 2017-2025 GHG emission standards. If the 2017-2025 GHG emission standards were included, the E85 refueling rates would be higher than shown in Figure 1. For model year 2016, Figure 1 implies E85 usage factors of between 40-50%. The usage factors between for model years 2017-2020 would be higher because the fuel economy of the 2017-2020 model year vehicles would be higher than was used by EPA to produce Figure 1. [Figure 1 can be found on p. 19 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, p. 18]

Figure 2 shows the Energy Information Agency’s projection of ethanol volume in the AEO2011 forecast. We also show the ethanol volume predicted in the latest AEO2012 Early Release forecast. EIA’s 2011forecast is very close to EPA’s mid level case through 2023, and then goes much higher than the EPA mid case. The early release 2012 forecast is between the low case and the mid case prior to 2028, and higher than EPA’s mid case after then. [Figure 2 can be found on p. 20 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, p. 19]

Figure 3 shows FFV fractions of the national on-road car + LDT fleet from 2010 through 2030 with two assumptions – that FFV sales would continue at about 23% from 2012 on, and that FFV sales stop in 2016. In 2020, if FFV sales continue, then 25% of the on-road fleet would be FFVs. Alternatively, if FFV sales stop in 2016, then only 12% of the fleet would be FFVs in 2020. Clearly, if FFV sales stop in 2016, it may be difficult for the FFV fleet to absorb RFS ethanol volumes. [Figure 3 can be found on p. 21 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, p. 20]

EPA's RFS benefits analysis depends on E85 being consumed to claim GHG benefits under these rules. And yet, EPA is not rolling these use projections into its guidance on FFVs to the manufacturers so they can continue to build FFVs to support the RFS. Thus, EPA should either provide guidance to the manufacturers on likely E85 use in the 2016-2025 timeframe, or EPA should downgrade the GHG benefits of the RFS due to lack of availability of FFVs, and charge these benefit downgrades against their current GHG proposal. [EPA-HQ-OAR-2010-0799-9505-A1, p. 21]

Growth Energy therefore recommends that EPA develop new default projections of E85 use based on EPA's projections of overall ethanol volumes that will be required under EISA. These projections should also incorporate the Agencies' new fuel economy levels for 2017-2025. The projections should be provided to the auto industry as usage factors so that they can make a clear determination of whether to optimize FFVs on E85 and whether to continue building FFVs after model year 2015. A further projection to calendar year 2025 can be made around calendar year 2016. [EPA-HQ-OAR-2010-0799-9505-A1, p. 21]

Growth Energy's proposal would provide for a certification and in-use fuel for 2017 and later vehicles with an octane value of 94, accomplished with E30 instead of E10. This fuel would only be intended for the 2017+ vehicles, and not the legacy fleet (2016 and earlier), although legacy FFVs could also use it if doing so was consistent with the vehicle manufacturers' instructions or recommendations to owners and approved by the Agencies on that basis. The non-FFV legacy fleet (i.e., Tier 1, Tier 2, and LEVs in Section 177 states) would continue to operate on E10. [EPA-HQ-OAR-2010-0799-9505-A1, p. 22]

It is important that the increase in octane be accomplished with ethanol and not other gasoline blending components because of ethanol's many advantages relative to the other high octane blending components as explained below. Ethanol has a very high octane number relative to other gasoline hydrocarbons, has a lower carbon content than the gasoline components it generally replaces, and has many other benefits that assist in combustion to increase engine efficiency and reduce both tailpipe GHG and criteria pollutant emissions. The use of a 94 octane E30 blend for 2017+ vehicles would also provide additional GHG and PM emission reductions in the U.S., greater than could be achieved by the current Agencies' proposal. We note that some vehicle manufacturers have also requested that EPA study higher octane fuels as a part of the GHG program, and have also recommended continued control of multi-substituted alkyl aromatics, since they can lead to increased HC and PM emissions. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 22-23]

C. Increased ethanol use can decrease PM emissions

There is substantial evidence that increased ethanol use will reduce PM mass and number emissions from the vehicle fleet. Szybist et al., 2011 also summarize recent literature for ethanol effects in production engines:

A number of investigations have examined the effect of ethanol content on particle emissions in vehicles. Storey et al. found that blends of 10 and 20% ethanol in gasoline (E10 and E20) decreased particle number emissions during vehicle drive cycles, with the 20% blend decreasing particles by about 40% during the high-load US06 vehicle drive cycle. In comparison to gasoline, He et al. found a 20% reduction in particle emissions with E20 but no change with E10. Khalek and Bougher showed that E10 increased particle emissions compared to two different gasoline formulations, both with higher volatility than the E10. This work showed the importance of the hydrocarbon fraction of the E10 blend and suggests that the heavier hydrocarbons used to control vapor pressure of E10 may also increase particulate emissions. Aakko and Nylund found that the particle mass emissions from 85% ethanol (E85) were comparable to those with gasoline in a PFI vehicle but that DI (direct injection) fueling with gasoline produced particle emissions that were an order of magnitude higher. (reference numbers omitted) [EPA-HQ-OAR-2010-0799-9505-A1, p. 26]

The Szybist et al. study investigated the effects of fuel type, fueling strategy, and engine breathing strategy on particle emissions in a flexible spark ignited engine that was designed for optimization with ethanol. They report:

When DI fueling is used for gasoline and E20, the particle number emissions are increased by 1 to 2 orders of magnitude compared to PFI fueling, depending upon the fuel injection timing. In contrast, when DI fueling is used with E85, the particle number emissions remain low and comparable to PFI fueling. Thus, by using E85, the efficiency and power advantages of DI fueling can be gained without generating the increase in particle emissions observed with gasoline and E20. The main finding of the study is that use of E85 results in 1 to 2 orders of magnitude reduction in particle emissions relative to sDI (spray-guided DI) fueling with gasoline and E20. Furthermore, sDI particle emissions with E85 are similar to that for PFI fueling with gasoline. Thus, an increase in particle emissions beyond that of PFI engines can be prevented while gaining the efficiency of DI engines using E85. [EPA-HQ-OAR-2010-0799-9505-A1, p. 27]

Storey et al., 2010 characterized the emissions, including PM and aldehydes, from a U.S. legal stoichiometric direct injected spark ignited (DISI) vehicle operating on E0, E10, and E20. The PM emissions were characterized for mass, size, number concentration and OC-EC (organic carbon-elemental carbon) content. The DISI particle number-size distribution curves were similar in shape to light-duty diesel vehicles without Diesel Particle Filters, but had lower overall particle number and mass emissions. The aggressive US06 transient cycle had much higher PM mass emissions in comparison to the PM mass emission observed for the FTP. With respect to added ethanol, Storey et al. concluded: [EPA-HQ-OAR-2010-0799-9505-A1, p. 27]

Ethanol blends reduced the PM mass and number concentration emissions for both transient and steady-state cycles. By increasing the ethanol blend level from E0 to E20, the average mass emissions declined 30% and 42% over the FTP and US06, respectively. Measurements during hot cycle transient operation demonstrated that E20 also lowered particle number concentrations. The adoption of small displacement, turbocharged DISI engines into the U.S. fleet is likely to continue in the future, and the results of this study suggest that increasing ethanol blend levels in gasoline will lower DISI PM emissions. In addition, increasing ethanol content significantly reduced the number concentration of 50 and 100 nm particles during gradual and wide open throttle (WOT) accelerations. [EPA-HQ-OAR-2010-0799-9505-A1, p. 27]

Maricq et al., 2012 tested a light-duty truck equipped with a 3.5-L V6 gasoline turbocharged direct injection engine that is representative of current GDI products, but contained prototype elements that allowed changes in engine calibrations. Because PM formation in GDI engines is sensitive to a number of operating parameters, two engine calibrations were examined to gauge the robustness of the results. The study used four fuels: certification test gasoline (E0), a commercial E10 fuel similar to that expected for future certification, a commercial pump grade E10, and a commercial E100 fuel used for blending. E100 and E0 were splash-blended to produce E17, E32, and E45 fuels. Maricq et al. report: [EPA-HQ-OAR-2010-0799-9505-A1, pp. 27-28]

As the ethanol level in gasoline increases from 0% to 20%, there is possibly a small (<20%) benefit in PM mass and particle number emissions, but this is within test variability. When the ethanol content increases to >30%, there is a statistically significant 30%–45% reduction in PM mass and number emissions observed for both engine calibrations. [EPA-HQ-OAR-2010-0799-9505-A1, p. 28]

The results reported by Zhang are also particularly informative. The key results are shown in Figure 1 below. In this testing, a 2008 FFV was tested on a hot Unified Cycle on E6, E35, E65, and E85. Ethanol appears to have caused a large reduction in PM emissions (an particularly PN) from E6 to E35, with further PM reductions as ethanol concentration increased. However, the most significant PM and PN reductions are between E6 and E35. [Figure 1 can be found on p. 29 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, p. 28]

Thus, there are now a substantial number of studies showing that ethanol blends of 20% and higher reduce PM mass and number emissions in a variety of engines and vehicles. [EPA-HQ-OAR-2010-0799-9505-A1, p. 29]

In addition to the evidence that increased ethanol use will reduce PM mass and number, the Agencies acknowledge that the proposal will increase the fraction of the U.S. fuel supply that is made up of renewable fuels. The proposal indicates:

For the purposes of this emission analysis, we assume that all gasoline in the timeframe of the analysis is blended with 10 percent ethanol (E10). However, as a consequence of the fixed volume of renewable fuels mandated in the RFS2 rulemaking and the decreasing petroleum consumption predicted here, we anticipate that this proposal would in fact increase the fraction of the U.S. fuel supply that is made up by renewable fuels. [EPA-HQ-OAR-2010-0799-9505-A1, p. 29]

C. The Ramp-up of Low CI Ethanol and Additional GHG Reductions

For the RFS, EPA estimates that ethanol from cornstarch peaks at 15 bgy in 2014. Additional increases in ethanol volumes are projected to come from advanced ethanol and cellulosic ethanol. Advanced ethanol is required to have a 50% reduction in lifecycle GHG emissions from gasoline, and cellulosic ethanol is required to have a 60% reduction in lifecycle emissions from gasoline. These additional volumes currently are projected to go into FFVs. [EPA-HQ-OAR-2010-0799-9505-A1, p. 35]

The ethanol volumes produced above E10 level could go into the 2017 and later vehicle fleet as E30, and additional ethanol volumes (as E85 or E3), would go into FFVs. The amount of ethanol needed for the 2017 and later model year vehicles would slowly build as these vehicles are introduced. These advanced and cellulosic volumes would increase steadily until the on-road fleet is fully turned over to 2017 and later vehicles. [EPA-HQ-OAR-2010-0799-9505-A1, p. 35]

Figure 2 shows the allocation of ethanol into different fleet sectors, assuming the AEO2011 volumes. This figure was developed using a fuel consumption model for the passenger car and LDT fleet, which was adjusted to include the effects of the 2012-2016 regulations and the 2017-2025 proposed rule. The decision priority for the use of ethanol was: [Figure 2 can be found on p. 36 of Docket number EPA-HQ-OAR-2010-0799-9505-A1]

- E30 in 2017+ vehicles first
- E10 in legacy fleet, including FFVs
- E85 in FFVs (if E30 were used, refueling frequency with E30 would be higher) [EPA-HQ-OAR-2010-0799-9505-A1, p. 35]

During the 2005 to 2010 period, E10 is ramping up in the fleet. Between 2010 and 2015, E85 use starts to increase. In the 2015-2020 period, E30 use starts in the 2017 and later fleet. This directly affects the frequency of E85 use in the FFVs. E10 volumes start to decline because the fleet is more fuel efficient, and vehicles using E10 (2016 and earlier) are declining in population. Between 2020 and 2025, E30 use is expanding rapidly, and E10 and E85 use continues to decline (although E30 could be used in FFVs as well). In 2030, E30 use is still increasing, and E10 use and E85 use are low by comparison. [EPA-HQ-OAR-2010-0799-9505-A1, p. 36]

We performed the same analysis for the AEO2012 Early Release values, and the E30 fleet did not utilize all of the ethanol from the FFVs, indicating expected available supplies of ethanol. [EPA-HQ-OAR-2010-0799-9505-A1, p. 36]

The addition of 20% more ethanol into E10 to boost octane value is expected to reduce the price of the blend relative to regular E10, not increase it. Table 4 shows average octane values for three octane blending components (alkylate, toluene, and ethanol) averaged over the period from January 2007 through February 2012. These values are determined by the bulk market price (Gulf Coast) of each component divided the blending octane of each component. For example, if ethanol is priced at 26 cents over unleaded gasoline and ethanol has a 113 blending octane, then the octane value of ethanol would be 26 cents divided by 26 (113 ethanol octane less 87 unleaded gasoline octane) or 1 cent per ethanol octane number. [EPA-HQ-OAR-2010-0799-9505-A1, p. 36]

The results show that ethanol is the cheapest octane blending component, and that the addition of ethanol reduces the price of the blend, and does not increase it like the other blending components. [See chart on p. 37 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, p. 37]

In Figure 3 we evaluated Ethanol, Alkylate and Toluene as components in a gasoline blend. We focused on formula octane as the sole value of each component, similar to a refiner evaluation of a commercially available stream. The solid black line represents the commercial gasoline value of octane as represented in the market by the relative cost of premium 93 FON conventional gasoline versus regular 87 FON conventional gasoline in the Gulf Coast spot bulk market. This is a good benchmark of octane value to a refiner as they optimize the mix of premium versus regular gasoline they make relative to the properties of the blending components they produce or purchase. The remaining lines represent Alkylate, Ethanol and Toluene. Over the entire period, ethanol is the least expensive octane blending component. [Figure 3 can be found on p. 37 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, p. 37]

Ethanol has several properties that make it very desirable blendstock with gasoline. These were discussed in a paper referred to earlier. [EPA-HQ-OAR-2010-0799-9505-A1, p. 38]

The high octane of ethanol allows the use of higher compression ratios, particularly in dedicated ethanol vehicles. The high heat of vaporization produces a charge cooling effect, which is particularly effective with direct injection engines that can again allow higher compression ratios. This effect is enhanced by the increased volume of fuel that is required to compensate for the lower energy content of ethanol. Even when a vehicle is not optimized to take advantage of some of ethanol’s attributes, the higher octane and faster flame propagation speeds for ethanol result in increased efficiency (miles per BTU of energy present in the fuel used) for high ethanol blends relative to gasoline. [EPA-HQ-OAR-2010-0799-9505-A1, p. 38]

The paper goes on to show that there is an approximate 2% efficiency gain for E85 in 2010 FFVs on E85, which are not optimized on E85 but on E0, and some companies are able to do better than this across their portfolio. [EPA-HQ-OAR-2010-0799-9505-A1, p. 38]

A second study by Delphi examined changes in performance and efficiency on an engine equipped with gasoline direct injection and other control technologies at different gasoline/ethanol blend levels. The study investigated methods of improving fuel consumption when fueled with E85. [EPA-HQ-OAR-2010-0799-9505-A1, p. 38]

The benefit of the improved strategies for reducing the disparity between fuel consumption with gasoline and E85 is almost entirely offset on the FTP city cycle but is less effective as the demands of the driving conditions increase. At highway cruise speeds the shift schedule has no effect since the vehicles is in overdrive in all cases, only the benefits of the lower final driver ratio and the engine modifications are evident. [EPA-HQ-OAR-2010-0799-9505-A1, p. 38]

The paper then goes on to discuss the potential benefits of lower ethanol blends: [EPA-HQ-OAR-2010-0799-9505-A1, p. 38]

It is also important to consider that many of the techniques used to improve performance on E85 would also improve fuel consumption with gasoline or lower ethanol blends. Differences will show up more in performance and may need a shift schedule dependent on the ethanol blends torque capability. Ethanol blends from near E20 provide a good compromise, enabling most of the performance of an E85 blend with a significantly reduced energy penalty. Blends in this range would likely be able to offset the fuel density penalties with improved efficiency while providing superior performance to gasoline. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 38-39]

The above discussions highlight the need to focus more on the power density of ethanol (power per unit volume) rather than the energy density (heat content per unit volume). When automakers can optimize on a particular ethanol blend, they are able to take increased advantage of ethanol's power density as opposed to its energy density, thereby improving vehicle fuel economy and extending vehicle range between refills. Much additional research is taking place in this area which will be released in the coming months. [EPA-HQ-OAR-2010-0799-9505-A1, p. 39]

---

1 California's own version of a biofuels strategy, its "low-carbon fuel standards" regulation, will be infeasible unless the California new-vehicle market can somehow absorb large numbers of pure electric and grid-connected hybrid electric vehicles.

6 The DOE values provided for corn ethanol did not include indirect land use effects. Growth Energy does not believe current analytical models and data permit reliable estimation of indirect land use effects for Midwest corn ethanol, particularly in regulatory settings. For purposes of this analysis, however, the values shown in Table 1 use the latest version of GREET (GREET2011) was used to estimate a lifecycle GHG emission rate for corn ethanol that included indirect land use effects, which was then used to adjust the DOE corn ethanol values relative to those for gasoline.

7 The 11% reduction using GREET is conservative. EPA, in its RFS RIA, estimated a 20% reduction for the average corn ethanol dry mill in calendar year 2022.

Organization: Minnesota Department of Commerce

However, I have serious concerns regarding unintended, yet detrimental consequences for the energy diversity and economic opportunity needed to most effectively accomplish stated goals.

The proposed rule is inconsistent with the 2007 Energy Independence and Security Act (EISA) which requires the use 36 billion gallons of renewable fuels by 2022 and the national Renewable Fuel Standard (RFS2). [EPA-HQ-OAR-2010-0799-7363-A1, p. 1]

The proposed rule, in effect, selects one technology pathway – vehicles powered by electric motors – as the national powertrain. 1) Due to difficulty anticipated for certifying use of renewable fuels in vehicles under anticipated new Tier III vehicle emission regulations; and 2) the elimination of vehicle use credits until renewable fuel use is increased by RFS2; 3) the opportunity to use renewable fuels as a means to reduce greenhouse gas emissions and reduce consumption of oil may be effectively eliminated. [EPA-HQ-OAR-2010-0799-7363-A1, p. 1]

In keeping with goal to and further reduce greenhouse gas emissions and reduce oil consumption, include the role of EISA and RFS2 in the proposed rule. [EPA-HQ-OAR-2010-0799-7363-A1, p. 1]

Organization: National Alliance of Forest Owners (NAFO)

While NAFO does not take issue with or seek to challenge the stringency of the actual fuel economy standards that the Agencies propose to impose on light-duty vehicles, NAFO does seek to ensure that government rulemakings reflect the role that woody biomass can play in achieving our nation's climate goals and appropriately encourage the use of this climate beneficial fossil fuel alternative. As described below, the climate benefits of woody biomass, which derive from the natural carbon cycle, are well-established and have already been recognized in a number of EPA policies. Moreover, woody biomass-based alternative fuels – and all biofuels – is an important part of this administration's "all-out, all-of-the-above strategy" to achieving energy security and energy independence. [EPA-HQ-OAR-2010-0799-9481-A1, p.2]

As the Agencies complete and ultimately implement this rulemaking, we urge them to seize opportunities to encourage the use of climate-beneficial woody biomass-based alternative fuels. Specifically, we urge the Agencies to 1) develop a science-based method for quantifying the climate benefits of woody biomass-based alternative fuels as compared to fossil fuels; and 2) apply the method immediately in model year 2017 or, alternatively, state in the preamble to the final rule that the Agencies will use the method in the mid-term evaluation following the completion of other ongoing assessments of the carbon benefits of biomass and biofuels. This will provide a credible approach for incorporating the carbon benefits of woody biomass-based alternative fuels into the Corporate Average Fuel Economy ("CAFE") Standard that does not presently appear to exist. [EPA-HQ-OAR-2010-0799-9481-A1, p.2]

I. Forest biomass is an important renewable fuel source leading to lower GHG lifecycle emissions than conventional fuels [EPA-HQ-OAR-2010-0799-9481-A1, p.2]

Wood from sustainably managed forests provides a renewable, low-carbon alternative to fossil fuels. According to U.S. Energy Information Administration ("EIA") data, biomass already supplies more than 50% of the nation's renewable energy.[1] Forests can provide ample sustainable, domestic supplies of biomass to produce liquid transportation fuels, electricity, thermal energy (heat and power for manufacturing and other industrial uses), and synthetic natural gas.[2] [EPA-HQ-OAR-2010-0799-9481-A1, p.2]

When evaluating the GHG emissions associated with fuels, a lifecycle analysis incorporates all steps in a "product system" to evaluate broader environmental impacts of products and processes. Using forest biomass as a renewable fuel source has significant carbon benefits because its lifecycle analysis GHG emissions are more favorable than those of petroleum and other fossil fuels. For example, the Department of Energy ("DOE") estimates that "[c]ellulosic ethanol use could reduce GHGs by as much as 86%."[3] In addition, EPA has determined, in conjunction with its Renewable Fuel Standard Program, that the lifecycle GHG emissions reductions associated with cellulosic ethanol may be as much as 92.7 percent.[4] Lifecycle analyses of biomass feedstocks used for electricity generation have produced similar results.[5]

Thus the prevailing science – in both the public and private sectors – acknowledges the significant carbon benefits of energy produced using renewable biomass from managed forests. [EPA-HQ-OAR-2010-0799-9481-A1, p.3]

II. The combustion of forest biomass is part of the ongoing carbon cycle [EPA-HQ-OAR-2010-0799-9481-A1, p.3]

The prevailing view in the science community is that, when forests are managed sustainably, CO_2 emissions from forest biomass are part of the natural carbon cycle and are balanced by carbon sequestration as forests grow. In other words the carbon that enters the atmosphere when forest biomass is combusted was previously absorbed from the atmosphere by the forest biomass and will be reabsorbed when new biomass is growth. [EPA-HQ-OAR-2010-0799-9481-A1, p.3]

As EPA has concluded, there is "[s]cientific consensus . . . that the CO_2 emitted from burning biomass will not increase total atmospheric CO_2 if this consumption is done on a sustainable basis."[6] Recognizing that CO_2 emissions from biomass combustion are inextricably tied to the forests where biomass is grown, EPA follows international convention and does not include emissions from biomass combustion in its national emissions totals.[7] Instead, EPA accounts for CO_2 emissions from biomass combustion by measuring changes in forest carbon stocks over time, recognizing that there is no net climate impact as long as forest carbon stocks are stable or increasing.[8] Similarly, DOE's Voluntary Reporting of Greenhouse Gases Program, authorized by Section 1605(b) of the Energy Policy Act of 1992, provides for exclusion emissions from the combustion of biomass fuels.[9] [EPA-HQ-OAR-2010-0799-9481-A1, pp.3-4]

More recently, EPA has affirmed the climate benefits of biomass energy combustion when compared fossil fuels by reconsidering its treatment of biogenic CO_2 emissions under the Prevention of Significant Deterioration ("PSD") and Title V Programs.[10] Recognizing that imposing regulatory burdens on the biomass energy sector would discourage development of this important renewable fuel supply, EPA has deferred regulation of CO_2 emissions from stationary sources for three years while it seeks to identify a method to quantify the climate benefits offered by biomass energy.[11] EPA has also convened a Biogenic Carbon Emissions Panel under the auspices of the Science Advisory Board to provide advice and recommendations as EPA completes the reconsideration process.[12] That process is ongoing, and NAFO is encouraged that the SAB will offer recommendations and conclusions that continue to affirm the strong climate benefits of biomass as a carbon neutral renewable energy source. [EPA-HQ-OAR-2010-0799-9481-A1, p.4]

EPA has consistently recognized the climate benefits of biomass energy and should remain committed to a regulatory approach that recognizes the climate benefits that bioenergy and biofuel producers provide in relation to fossil fuels. Similarly, EPA must ensure that the treatment of biofuels under this proposed rule is consistent with its overarching regulatory approach. [EPA-HQ-OAR-2010-0799-9481-A1, pp.4-5]

III. The promotion of renewable energy is a national policy that the Agencies must follow [EPA-HQ-OAR-2010-0799-9481-A1, p.5]

As described above, forests and forest products can play an important role in reducing and managing GHG emissions. Expanding the sources of renewable energy is a central feature of both national and international policy to reduce reliance on fossil fuels. [EPA-HQ-OAR-2010-0799-9481-A1, p.5]

EPA, in considering approaches toward addressing climate change, has long recognized that responsibly managed forests are considered one of five key "groups of strategies that could substantially reduce emissions between now and 2030."[13] Similarly, the United Nation's Intergovernmental Panel on Climate Change ("IPCC") report on mitigation technologies highlights forest management as a primary tool to reduce GHG emissions.[14] In fact EIA projects that biomass energy will account for 30% of the growth in electricity produced by renewable fuels between now and 2035.[15] [EPA-HQ-OAR-2010-0799-9481-A1, p.5]

President Obama has repeatedly emphasized that renewable energy derived from feedstocks such as forest biomass hold the key to transitioning the nation to a "sustainable, low carbon energy future."[16] Recognizing the benefits of all types of biomass, he recently stated that "another substitute for oil that hold tremendous promise is renewable biomass – not just ethanol, but biofuels made from things like switchgrass and wood chips and biomass."[17] And in last month's State of the Union Address the President advocated an "all-out, all-of-the-above strategy that develops every available source of American energy," specifically referencing a "clean energy standard" that would encourage the development of clean renewable energy including biomass fuels.[18] [EPA-HQ-OAR-2010-0799-9481-A1, pp.5-6]

With Presidential endorsement, if not direction, of national renewable energy policy and the role of biomass in that policy, the Agencies must conduct their programs in a manner consistent with that policy. In light of this policy, the Agencies must ensure that their regulations appropriately encourage the use of woody biomass-based fuels as clean, renewable alternatives to fossil fuels by distinguishing between GHG emissions from each source. While the proposed rule does provide preferential treatment to ethanol as an alternative fuel, the regulations would further benefit from the development of a science-based method that quantifies the climate benefits of woody biomass-based alternative fuels. [EPA-HQ-OAR-2010-0799-9481-A1, p.6]

IV. The Agencies should develop and implement a science-based method to account for the climate benefits of woody biomass-based alternative fuels [EPA-HQ-OAR-2010-0799-9481-A1, p.6]

Although the proposed fuel economy standards apply to manufacturer vehicle fleets and do not apply directly to consumers' fuel purchases, they can still reflect the climate-benefits of woody biomass-based alternative fuels, whether used in dedicated biofuel vehicles or in flexfuel vehicles. For example, as recognized in the proposed rule, the CAFE Standards calculations for flex fuel vehicles are currently governed by 49 U.S.C. § 32905, which assumes that alternative fuels are used 50 percent of the time in flex-fuel vehicles and treats each gallon of alternative liquid fuel as the equivalent of 0.15 gallons of gasoline. Thus, flex fuel vehicles – and ethanol-based fuels – are currently encouraged by discounting biogenic CO_2 emissions in comparison to fossil fuel CO_2 emissions. However, the 0.15 divisor applies equally to all alternative liquid fuels and is not directly related to the carbon benefits of the alternative fuel. Indeed, it may even underestimate the climate benefits of some alternative fuels such as cellulosic ethanol. [EPA-HQ-OAR-2010-0799-9481-A1, p.6]

As noted in the proposed rule, these special calculation procedures in 49 U.S.C. § 32905 are being phased out and will expire entirely for model year 2020 vehicles. We agree with the Agencies that the light-duty vehicle rule should continue to encourage the use of clean, renewable, alternative fuels such as cellulosic ethanol even after the statutory mandate expires in 2020. It should not treat woody biomass-based and fossil fuels equally. Thus we support the Agencies' proposal to continue to discount CO_2 emissions from alternative fuels as compared to fossil fuel CO_2 emissions. But rather than uniformly applying a 0.15 divisor to all alternative liquid fuels, the Agencies should develop a science-based method that quantifies the climate benefits of each alternative fuel and provide proper incentives for each alternative liquid fuel in comparison to traditional fossil fuels and each other. [EPA-HQ-OAR-2010-0799-9481-A1, pp.6-7]

To the extent that either Agency has the opportunity to deviate from the statutory requirements of 49 U.S.C. § 32905, now or in the future, it should adopt an approach that is grounded in science. Since the 0.15 divisor was enacted in 1994, there have been numerous studies of the climate benefits of biomass and EPA has engaged in efforts to quantity the climate benefits associated with biomass energy. Two recent examples include a life cycle analysis of cellulosic ethanol completed in conjunction with the RFS2 program and EPA's ongoing reconsideration of biogenic CO_2 emissions from stationary sources which is currently under review by the Science Advisory Board Biogenic Carbon Emissions Panel. Each of these programs offer a means to quantify the climate benefits of biomass energy as compared to fossil fuels. In order to aid the regulated community and provide consistency among regulatory program, the Agencies should adopt a harmonized approach to accounting for the climate benefits of biomass energy. We urge the Agencies to use the light-duty vehicle rule as a means to harmonize the findings of existing regulatory programs. [EPA-HQ-OAR-2010-0799-9481-A1, p.7]

Given the ongoing nature of EPA's reconsideration of biogenic CO_2 emissions from stationary sources and the continued applicability of 49 U.S.C. § 32905(a) to NHTSA's CAFE Standard calculations through model year 2019, the mid-term evaluation process already included in the proposed rule provides a means for EPA to harmonize is regulatory approaches to woody biomass-based fuels after having the opportunity to complete its scientific review of both mobile and stationary sources while allowing EPA and NHTSA to maintain uniform fuel economy standards for mobile sources. While a continuation of the 0.15 divisor may be appropriate today given NHTSA's statutory mandate and EPA's ongoing scientific reviews, EPA should use the intervening time before the mid-term review to synthesize its existing approaches to accounting for biogenic CO_2 emissions and develop a science-based method to account for the climate benefits of woody biomass-based alternative fuels as compared to fossil fuels. The EPA should then, at the earliest opportunity, apply the method in place of the generic 0.15 divisor and provide an exclusion, if appropriate, for vehicles that rely entirely on the combustion of woody biomass-based alternative biofuels. We thus urge the Agencies in the preamble to the final rule to recognize the opportunities that woody biomass-based alternative fuels can provide to reduce CO_2 emissions by committing to develop and apply a science-based method to quantify the climate benefits of woody biomass-based alternative fuels as part of their mid-cycle review. [EPA-HQ-OAR-2010-0799-9481-A1, pp.7-8]

1 - See, EIA, Annual Energy Review (Oct. 19, 2011), available at http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb1001. [EPA-HQ-OAR-2010-0799-9481-A1, p.2]

2 - See NAFO, Carbon Neutrality of Energy from Forest Biomass, available at http://nafoalliance.org/carbon-neutrality-of-energy-from-forest-biomass/. [EPA-HQ-OAR-2010-0799-9481-A1, p.2]

3 - Department of Energy, Ethanol Benefits, available at http://www.afdc.energy.gov/afdc/ethanol/benefits.html (last visited Jan. 30, 2012). [EPA-HQ-OAR-2010-0799-9481-A1, p.3]

4 - See EPA, DPA420-D-06-008, Renewable Fuel Standard Program: Draft Regulatory Impact Analysis at 191 (Sept. 2006). [EPA-HQ-OAR-2010-0799-9481-A1, p.3]

5 - Cherubini, et al., Energy- and greenhouse gas-based LCA of biofuel and bioenergy systems: Key issues, ranges and recommendations, Resources, Conservation and Recycling 535: 434-447 (2009) (90-95% emissions reductions relative to fossil fuel systems); Zhang, et al., Life cycle emissions and cost of producing electricity from coal, natural gas, and wood pellets in Ontario, Canada, Environmental Science and Technology 44(1): 538-544 (2010) (91% and 78% emissions reductions relative to coal and natural gas systems); Raymer, A.K.P., A comparison of avoided greenhouse gas emissions when using different kinds of wood energy, Biomass and Bioenergy 30: 605-617 (2006) (81-89% emissions reductions relative to fossil fuel alternatives). [EPA-HQ-OAR-2010-0799-9481-A1, p.3]

6 - Environmental Protection Agency Combined Heat and Power Partnership, Biomass Combined Heat and Power Catalog of Technologies, 96 (Sept. 2007), available at http://www.epa.gov/chp/documents/biomass_chp_catalog.pdf. [EPA-HQ-OAR-2010-0799-9481-A1, p.3]

7 - EPA, Inentory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009 3-59 (April 15, 2011). [EPA-HQ-OAR-2010-0799-9481-A1, p.4]

8 - Id. Chapter 7. [EPA-HQ-OAR-2010-0799-9481-A1, p.4]

9 - See DOE, Technical Guidelines: Voluntary Reporting of Greenhouse Gases (1605(b)) Program (January 2007) at 77 (“Reporters that operate vehicles using pure biofuels within their entity should not add the carbon dioxide emissions from those fuels to their inventory of mobile source emissions because such emissions are considered biogenic and the recycling of carbon is not credited elsewhere.”). [EPA-HQ-OAR-2010-0799-9481-A1, p.4]

10 - Letter from Gina McCarthy to Roger Martella (Jan. 12, 2011) granting NAFO's Petition for Reconsideration, available at http://www.epa.gov/nsr/ghgdocs/McCarthytoMartella.pdf. [EPA-HQ-OAR-2010-0799-9481-A1, p.4]

11 - Deferral for CO_2 Emissions From Bioenergy and Other Biogenic Sources Under the Prevention of Significant Deterioration (PSD) and Title V Programs, 76 Fed. Reg. 43,490 (July 20, 2011). [EPA-HQ-OAR-2010-0799-9481-A1, p.4]

12 - See generally EPA, Carbon Dioxide Accounting for Emissions from Biogenic Sources, http://yosemite.epa.gov/sab/SABPRODUCT.NSF/81e39f4c09954fcb85256ead006be86e/2f9b572c712ac52e8525783100704886!OpenDocument (last visited Jan. 31, 2012). [EPA-HQ-OAR-2010-0799-9481-A1, p.4]

13 - Regulating Greenhouse Gas Emissions Under the CAA, 73 Fed. Reg. 44,354, 44,405 (July 30, 2008). [EPA-HQ-OAR-2010-0799-9481-A1, p.5]

14 - Id. at 44,405-06; see also, NAFO, Carbon Mitigation Benefits of Working Forests (identifying trading platforms and registries that recognize forest management), available at http://nafoalliance.org/mitigationbenefits-working-forests/. [EPA-HQ-OAR-2010-0799-9481-A1, p.5]

15 - EIA, Annual Energy Outlook 2012 Early Relese Overview 7, available at http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2012).pdf. [EPA-HQ-OAR-2010-0799-9481-A1, p.5]

16 - Letter from President Barack Obama to Governors John Hoeven and Chet Culver (May 27, 2009), available at http://www.governorsbiofuelscoalition.org/assets/files/President%20Obama's@20Response5-27-09.pdf; see also President Barack Obama, Memorandum for the Secretary of Agriculture, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, 74 Fed. Reg. 21,531-32 (May 5, 2009). [EPA-HQ-OAR-2010-0799-9481-A1, p.5]

17 - President Barack Obama, Remarks by the President on America's Energy Security, March 30, 2011, available at http://www.whitehouse.gov/the-press-office/2011/03/30/remarks-president-americas-energysecurity. [EPA-HQ-OAR-2010-0799-9481-A1, p.5]

18 - President Barack Obama, Remarks by the President in State of the Union Address, January 24, 2012, available at http://www.whitehouse.gov/the-press-office/2012/01/24/remarks-president-state-unionaddress. [EPA-HQ-OAR-2010-0799-9481-A1, p.6]

Organization: National Association of Convenience Stores (NACS)

CAFE and RFS Compatibility [EPA-HQ-OAR-2010-0799-9543-A1, p. 1]

In the Energy Independence and Security Act of 2007 (EISA), Congress revised the RFS to require that a minimum of 36 billion gallons of qualified renewable fuels be integrated into the motor fuels supply by 2022. This objective was expected to represent approximately 21% - 25% of the overall gasoline market (based upon 2007 gasoline consumption and assuming an annual increase in demand of up to 1%). However, the proposed CAFE revisions could dramatically reduce the amount of motor fuel consumed in 2022 and beyond, creating a situation in which renewable fuels will be required to represent a significantly greater share of the market than originally anticipated. [EPA-HQ-OAR-2010-0799-9543-A1, pp. 1-2]

To illustrate the challenge the two regulations present to the market, NACS has analyzed the Energy Information Administration's (EIA) 2011 Annual Energy Outlook. In this report, EIA evaluated two different CAFE scenarios - one factoring for an annual average fuel economy improvement of 3% and one factoring for an improvement of 6%. The current proposed rule calls for an annual improvement of 4.1% to 4.3%. Therefore, it is most sensible to use the more conservative model and evaluate market conditions under a 3% scenario. Please note that this analysis forecasts a market condition that is less extreme than what is likely to materialize under the proposed rule. [EPA-HQ-OAR-2010-0799-9543-A1, p. 2]

In creating this comparison, NACS has assumed that the RFS will be satisfied by blending renewable fuels with gasoline. The RFS requires a specific volume of bio-mass based diesel, but this is not a significant component of the program. Whether the renewable fuel brought to market is ethanol, butanol, or some other type of additive, it is likely to be optimized by blending with gasoline. [EPA-HQ-OAR-2010-0799-9543-A1, p. 2]

Therefore, NACS has compared EIA's projected finished gasoline volumes under a CAFE3 model with the mandated volumes of the RFS (less the biodiesel component). The following chart demonstrates the applicable blend rate required in this market scenario: [See chart on p. 2 of Docket number EPA-HQ-OAR-2010-0799-9543-A1] [EPA-HQ-OAR-2010-0799-9543-A1, p. 2]

Under a 3% annual improvement in fuel economy, compliance with the RFS will require a blend rate of 37.51% in 2022. This level of renewable fuels penetration in the market will impose significant economic burdens on the retail fuels market and consumers. [EPA-HQ-OAR-2010-0799-9543-A1, p. 2]

Organization: National Corn Growers Association et al.

The Energy Independence and Security Act (EISA) of 2007 called for the reduction of petroleum fuel use and greenhouse gas emissions (GHG), and it specified the use of 36 billion gallons of renewable fuels by 2022. In response, EPA promulgated the revised Renewable Fuel Standard (RFS2) that required increasing volumes of renewable fuels over a 10 year period from 2012 to 2022 to reach the 36 billion gallon statutory requirement. The renewable fuels specified in RFS2 were broken down into categories of conventional renewable biofuel (15 billion gallons), and advanced biofuels (21 billion gallons). Advanced biofuels were further divided into biodiesel, cellulosic biofuels and other advanced biofuels such as sugar cane ethanol. Each category or subcategory had its own requirement for GHG reductions; conventional renewable biofuels, primarily corn ethanol were required to reduce GHG by 20%, advanced biofuels by 50% and cellulosic biofuels by 60%. [EPA-HQ-OAR-2010-0799-9565-A1, p.2]

Due to substantial advances in crop production and energy efficiency improvements in ethanol production, corn starch ethanol significantly exceeds the 20% requirement on average. Indeed, the feasibility of meeting the 50% advanced biofuel requirement with corn ethanol has been demonstrated. EPA must fully account for these GHG reductions in RFS2 since January 1, 2008 and ensure that future GHG reductions for corn ethanol are fully credited as well. We further encourage EPA to perform a complete GHG inventory assessment of the RFS2 program through 2022. [EPA-HQ-OAR-2010-0799-9565-A1, p.2]

In its dual goals of reductions in petroleum fuel use and greenhouse gas emissions, EISA was concerned with addressing national energy security as well as greenhouse gas emissions concerns. Its requirement to displace about 25% of our national gasoline use with renewable fuels was a reasonable and effective means of addressing energy security by providing a diverse supply base. This diversity of supply is an important way to make the US economy more resilient to oil supply and price shocks since a vehicle population composed of sufficient numbers of Flexible Fuel Vehicles (FFVs) can easily and quickly switch to petroleum based fuel substitutes such as ethanol blends. In fact, vehicle fuel economy standards without petroleum fuel substitutes such as those required by EISA can do little to enhance oil security. [EPA-HQ-OAR-2010-0799-9565-A1, p.2]

We are concerned that the proposed CAFE/GHG rule is inconsistent with the RFS2 regulation and the EISA requirement to use 36 billion gallons of renewable fuel in 2022 in several areas. In other regulatory actions, EPA continues to express support for achieving the requirements of RFS2[1], yet there is no mention in the CAFE/GHG rule concerning the role of renewable alternative fuels in achieving the required GHG reductions. Many credits are provided in the rule that can be applied by vehicle manufacturers toward achieving the fuel economy and greenhouse gas emission requirements. [EPA-HQ-OAR-2010-0799-9565-A1, p.2]

Nearly all of these credits either directly or indirectly provide incentives for the production of electric vehicles including hybrid electric (HEV), plug-in hybrid electric (PHEV), fuel cell electric (FCEV) or battery electric (BEV) vehicles. For example, multiplier factors are provided for BEVs, PHEVs and FCEVs only, and electric propulsion for light duty trucks is favored over diesel or renewable alternative fuels. These credits which arbitrarily favor electric vehicle technology may interfere with RFS2 compliance strategies, and may send conflicting signals to the marketplace with unknown and potentially adverse economic impacts. [EPA-HQ-OAR-2010-0799-9565-A1, pp.2-3]

In the RFS2 regulation, EPA projects “Low”, “Mid” and “High” volume scenarios for ethanol use, and examines FFV fuel usage rates to consume these volumes[6]. The scenarios are built on the assumption that 15B gallons of ethanol would be consumed as E10. Under EPA’s Mid Volume scenario, 22.2 billion gallons of ethanol would be consumed by 2022 to comply with RFS2 requirements, FFV production by the Detroit 3[7] vehicle manufacturers would continue at a rate of at least 50% of annual production, 60% of FFVs would require “reasonable” access to E85 (24,000 refueling stations) and these FFVs would refuel with E85 at every opportunity. By EPA’s analysis, FFV production at a rate of at least 50% of vehicles produced would have to continue through 2022 in order to consume RFS2 volumes. A recent analysis by Air Improvement Resource examines EPA’s ethanol volume and FFV use scenario projections in detail[8]. It concluded that even if the EPA waiver for E15 were extended to all light duty vehicles, continued production of FFVs and higher level ethanol blends would be required in order to consume RFS2 volumes. [EPA-HQ-OAR-2010-0799-9565-A1, p.3]

A major inconsistency between the proposed CAFE/GHG rule and the RFS2 regulation is that the production of FFVs is discouraged by the proposed rule which would likely result in discontinuing FFV production after 2015. EISA extended fuel economy incentives for FFVs until 2020 because Congress wanted to encourage the continued production of vehicles that could use higher volume blends of ethanol up to E85. However, beyond 2015, EPA would require that the incentive be pro-rated based on use of the alternative fuel (E85 or ethanol blend greater than E15). Since E85 is dispensed at less than 2% of US fueling stations, it is not surprising that E85 use may still be less than 100 million gallons per year[9]. The result is that FFV production incentives would cease to exist as a practical matter after 2015. Congress expressed concern at a hearing in May 2011 that EPA chose to effectively eliminate FFV incentives after 2015 in the Supplemental Notice of Intent for the 2017 to 2025 CAFE/GHG rule.[10] [EPA-HQ-OAR-2010-0799-9565-A1, pp.3-4]

The purpose of the FFV incentives, sometimes referred to as CAFE credits created by the Alternative Motor Fuels Act of 1988 was to insure that an adequate number of FFVs were available in the fleet that could use E85 when it became available. Although E85 has not become widely available, the RFS2 regulation requires volumes of renewable fuels including ethanol that would require more FFVs than are currently available in the fleet. It is counter to the intent of EISA and the purpose of FFV credits to effectively phase them out just when FFVs are needed to consume RFS2 renewable fuel volumes. [EPA-HQ-OAR-2010-0799-9565-A1, p.4]

Although the proposed CAFE/GHG rule provides many credits for electric vehicles, it disallows credits for FFV technology on the basis of fuel cost. The concern for high relative cost of mid or high level ethanol blends does not seem to be justified in the term of the CAFE/GHG and RFS2 rules since at some point in the renewable fuel volume ramp-up of RFS2, market forces would result in competitive prices for ethanol and gasoline in order for the required volumes to be sold. As a result, the continuation of FFV incentives can be justified in order to consume the required RFS2 volumes of renewable fuels, and to be consistent with EISA’s intent. [EPA-HQ-OAR-2010-0799-9565-A1, p.4]

We recommend modifications to the proposed rule in the following three areas to achieve a more balanced, technology neutral approach to the control of fuel economy and GHG. [EPA-HQ-OAR-2010-0799-9565-A1, p.4]

Allow vehicle and fuel technologies to compete on a level playing field to meet fuel economy and GHG standards, rather than constructing credits to favor electric vehicle technology over renewable fuels. [EPA-HQ-OAR-2010-0799-9565-A1, p.4]

Provide flexibility within the rule and integrate RFS2 requirements such that renewable fuels can contribute to the greenhouse gas emission reduction requirements in the rule. [EPA-HQ-OAR-2010-0799-9565-A1, p.5]

Provide incentives for the production of FFVs that are needed to consume RFS2 renewable fuel volumes. [EPA-HQ-OAR-2010-0799-9565-A1, p.5]

We further believe that modifications in these areas would be more cost-effective and more consistent with EISA in addressing energy security, renewable fuel use and greenhouse gas emissions. We stand ready to convene a dialog with the agencies in this regard. [EPA-HQ-OAR-2010-0799-9565-A1, p.5]

---

1 - EPA News Brief, "EPA Finalizes 2012 Renewable Fuel Standards", December 27, 2011, "EPA continues to support greater use of renewable fuels within the transportation sector every year through the RFS2 program, which encourages innovation, strengthens American energy security, and decreases greenhouse gas pollution." [EPA-HQ-OAR-2010-0799-9565-A1, p.2]

6 - Renewable Fuel Standard, Regulatory Impact Analysis, EPA-420-R-10-006, February 2010. [EPA-HQ-OAR-2010-0799-9565-A1, p.3]

7 - General Motors, Ford, Chrysler [EPA-HQ-OAR-2010-0799-9565-A1, p.3]

8 - "Flexible-Fuel Vehicle and Refueling Infrastructure Requirements Associated with Renewable Fuel Standard (RFS2) Implementation", Air improvement Resource, March 2011. [EPA-HQ-OAR-2010-0799-9565-A1, p.3]

9 - http://www.eia.gov/renewable/alternative_transport_vehicles/pdf/attf_c1.pdf [EPA-HQ-OAR-2010-0799-9565-A1, p.4]

10 - Congress did not add a fuel use requirement as a condition of extending FFV credits in EISA, and such a requirement appears to be inconsistent with Congress' intent. The following quotes are taken from comments by Congressman John Shimkus at a U.S. House of Representatives, Subcommittee on Energy and Power hearing on May 11, 2011 entitled, "The American Energy Initiative". Congressman Shimkus' comments are documented in an EPA response letter to Congress dated June 22, 2011. Congressman Shimkus: "Please provide this Subcommittee with a list of areas in the EPAINHTSA joint rulemaking of May 7, 2010 where EPA's rules are contrary to the program designed by Congress in EPCA as amended by EISA, and why EPA chose to substitute its judgment over the clear, specific policy preferences passed by Congress." "How can this rule be characterized as 'harmonized and consistent' if the way EPA treats FFV vehicles is markedly different than the way Congress mandated FFV credits be treated under CAFE?." [EPA-HQ-OAR-2010-0799-9565-A1, p.4]

Organization: Plant Oil Powered Diesel Fuel Systems, Inc.

Flex-Fuel Vehicles ("FFV's") equipped to run on 85 percent ethanol count as emitting only 15 percent of the GHG's that the same vehicle would emit without the FFV capability, even though the Agencies admit that, "[H]istorically consumers have only fueled these vehicles with E85 a very small percentage of the time." 76 Fed. Reg. at 74880. [EPA-HQ-OAR-2010-0799-10337-A2, pp. 5-6]

D. Ethanol

At present, the United States produces around 1.5 billion gallons of ethanol per year, approximately one-tenth of the 2022 goal for renewable fuels set by the Renewable Fuels Standard. U.S. Department of Energy ("DOE"), Office of Energy Efficiency and Renewable Energy, Freedom CAR & Vehicle Technologies Program, "Just the Basics: Ethanol" (Feb. 7, 2012) (www1.eere.energy.gov/vehiclesandfuels/pdfs/basics/jtb_ethanol.pdf). [EPA-HQ-OAR-2010-0799-10337-A2, p. 9]

Ethanol engenders agricultural practices, such as intensive use of fertilizer, that makes its increased use unsustainable for the environment. With Americans now farming more corn than in the past sixty years because of rising demand for ethanol derived from corn, nitrogen leaching from fertilized corn fields is a primary cause of hypoxia and fish kills in the Gulf of Mexico. S.D. Donner and C.J. Kucharik, "Corn-Based Ethanol Production Compromises Goal of Reducing Nitrogen Export by The Mississippi River," Proceedings of the National Academy of Sciences (March 18, 2008), at 1 and Abstract (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2393748/). Expanding corn-based ethanol production would make controlling export of nitrogen to the Gulf practically impossible without large changes in food production and agricultural management. Id., Abstract. [EPA-HQ-OAR-2010-0799-10337-A2, pp. 9-10]

Organization: Renewable Fuels Association (RFA)

The proposal significantly discourages production of flexible fuel vehicles (FFVs) beyond 2016 by treating FFVs differently than other dual-fueled vehicles. The creation of incentives for certain dedicated alternative fuel vehicles also disadvantages FFVs. [EPA-HQ-OAR-2010-0799-9490-A1, p.1]

If implemented as proposed, the CAFE/GHG rule would frustrate the goals of the Energy Independence and Security Act of 2007 and significantly complicate compliance with the Renewable Fuel Standard (RFS). [EPA-HQ-OAR-2010-0799-9490-A1, p.1]

THE PROPOSAL SIGNIFICANTLY DISCOURAGES PRODUCTION OF FFVs BEYOND 2016 BY TREATING FFVs DIFFERENTLY THAN OTHER DUAL-FUELED VEHICLES. THE CREATION OF INCENTIVES FOR CERTAIN DEDICATED ALTERNATIVE FUEL VEHICLES ALSO DISADVANTAGES FFVs. [EPA-HQ-OAR-2010-0799-9490-A1, p.3]

In its final rule regarding MY2012-2016 CAFE/GHG standards, EPA promulgated provisions that, beginning in 2016, require automakers to demonstrate alternative fuel (i.e. E85) use in FFVs in order to generate fuel economy credits and determine emissions compliance values for those vehicles. The methodology established by these provisions assumes FFVs operate on gasoline 100% of the time, but allows a manufacturer to generate CAFE/GHG credits for its FFVs if it can document the percentage of miles driven on E85 versus gasoline for those vehicles. As discussed in comments from the stakeholders to EPA in response to the MY2012-2016 proposal, it is highly unlikely automakers have the resources or information necessary to provide proof of alternative fuel usage in the FFVs they manufacture. Thus, for all practical intents and purposes, fuel economy and emissions credits for FFVs cease to become relevant in MY2016 and automakers have no clear incentive to continue producing FFVs. In its current proposal for MY2017-2025, EPA/NHTSA state they do not intend to change the methodology for FFVs fuel economy calculations and emissions compliance values established in the rule for MY2012-2016. [EPA-HQ-OAR-2010-0799-9490-A1, pp.3-4]

One possible approach to determining utility factors for FFVs would be to base alternative fuel use on the levels of ethanol that FFVs will need to consume to comply with future RFS volume requirements. Notwithstanding the proposal's imbalanced application of utility factors, we do support EPA/NHTSA's proposal to continue the use of the 0.15 divisor for ethanol for MY2020 and later when calculating fuel economy. [EPA-HQ-OAR-2010-0799-9490-A1, p.4]

The Energy Independence and Security Act of 2007 substantially expanded the Renewable Fuel Standard originally enacted by Congress in the Energy Policy Act of 2005. The expanded RFS (known as RFS2) requires the consumption of 36 billion gallons of renewable fuels by 2022, and it is widely expected that the requirements will be met predominantly with ethanol. Indeed, in its Final Regulatory Impact Analysis for the RFS2, EPA analyzed a case where ethanol accounts for 33.2 billion gallons (92%) of the 36 billion gallon requirement in 2022. This amount of ethanol correlates to roughly 24% of expected gasoline demand in the 2022 timeframe.[7] [EPA-HQ-OAR-2010-0799-9490-A1, pp.5-6]

However, the amount of ethanol that can be used in the United States today is practically limited to 10% of the gasoline pool. This is because the Clean Air Act generally limits the amount of ethanol that can be consumed by conventional light-duty cars and trucks to 10%vol. (E10). EPA approved a waiver request allowing the use of E15 (15%vol. ethanol) for conventional light duty vehicles MY2007 or newer in November 2010. In January 2011, EPA extended the E15 waiver to MY2001. However, several additional regulatory and marketplace obstacles must be negotiated before significant volumes of E15 can realistically penetrate the marketplace. Thus, a maximum of roughly only 13-14 billion gallons of ethanol can currently be consumed by the conventional light-duty car and truck fleet at the E10 level, based on expected gasoline demand in the near term. Once E15 is broadly available in the marketplace, the conventional automotive fleet may be capable of consuming 18-20 billion gallons of ethanol, still far below the 2022 requirements of the RFS2. [EPA-HQ-OAR-2010-0799-9490-A1, p.6]

Based on the AIR study findings, we are confused as to how EPA/NHTSA reached the conclusion that the proposed CAFE/GHG emissions rule would have "no effect on volumes of ethanol and other renewable fuels," and we encourage the agency to revisit that portion of its analysis. [EPA-HQ-OAR-2010-0799-9490-A1, p.6]

Only FFVs may currently consume ethanol blends greater than E15. Thus, accelerated growth of FFVs will be necessary to consume the increasing ethanol volumes expected under the RFS2. The "Big 3" domestic automakers have committed to a goal of 50% of their new vehicles being FFV-capable in 2012 and thereafter. A 2011 study conducted for RFA by Air Improvement

Resource, Inc. (AIR) demonstrated that this commitment by the domestic automakers would technically enable the U.S. automotive fleet to consume 33.2 bg of ethanol by 2022 (Attachment A). The study also showed that a failure to ensure at least 50% of new vehicles are FFV-capable in 2012 and thereafter would result in falling short of long-term RFS2 volume requirements. [EPA-HQ-OAR-2010-0799-9490-A1, p.6] [For attachment A please refer to EPA-HQ-OAR-2010-0799-9490-A1, pp.9-54]

We are greatly concerned that by discouraging the continued production of FFVs beyond MY2016, the renewable fuel volumes required under the RFS2 likely cannot be consumed by the future U.S. automotive fleet. Thus, we encourage EPA to consider actions that place FFVs on a level playing field with other dual-fueled and dedicated alternative fuel vehicles for the purposes of complying with the proposed MY2017-2025 standards. [EPA-HQ-OAR-2010-0799-9490-A1, p.6]

Meanwhile, in regard to emissions compliance values and fuel economy calculations for plug-in hybrid electric vehicles (PHEVs) and dual-fueled compressed natural gas vehicles (CNGVs), EPA/NHTSA are proposing to allow the use of theoretical “utility factors” that assume PHEVs and CNGVs operate on gasoline only half of the time. EPA/NHTSA’s rationale for allowing the use of these utility factors for some dual-fueled vehicles but not for others is highly questionable. EPA/NHTSA state that PHEV and CNGV owners paid a premium for their vehicles and thus will seek out and predominantly use alternative fuels more frequently than they will use gasoline. EPA/NHTSA also assume the alternative fuels used by PHEVs and CNGVs will be cheaper than gasoline on a per mile basis. These assumptions do not take into account that refueling access for these vehicles may be limited or unavailable (EPA/NHTSA also assume, without basis, that PHEV drivers will always recharge once per day). Further, the cost per mile for these fuels may actually prove to be higher than gasoline, and prices may fluctuate as demand increases. If theoretical utility factors are to be applied to PHEVs and CNGVs, they should also apply to FFVs and any other dual-fueled vehicles. [EPA-HQ-OAR-2010-0799-9490-A1, p.4]

---

7 - The Energy Information Administration’s 2011 Annual Energy Outlook projects 2022 motor gasoline demand at 139.96 billion gallons.

Organization: Volkswagen Group of America

d. Credit mechanisms should be included to encourage greater use of biofuels in both spark ignited and compression ignition engines

Volkswagen explained that a bio-fuel credit mechanism would support the RFS II regulation and other complementary government policies regarding the reduced use of imported oil. [EPA-HQ-OAR-2010-0799-9569-A1, p. 5]

Response:

Basing the weighting of ethanol and gasoline use in an ethanol FFV on actual fuel use

Many of the above comments addressed this issue. Some commenters advocated for EPA to extend the utility factor methodology, adopted for PHEVs and dual fuel CNG vehicles, to ethanol FFVs. The agency disagrees with the objections raised by the Renewable Fuels Association and other commenters with respect to the selective use of utility factors for various dual fuel vehicles. EPA continues to believe that it is appropriate to assume that owners of some types of dual fuel vehicles, such as PHEVs and CNG vehicles, will preferentially seek to use the alternative fuel when the vehicle is much more expensive to purchase and much less expensive to operate on the alternative fuel—why else would the consumer pay more for the vehicle if (s)he did not intend to use the cheaper fuel? Similarly, EPA believes it is not appropriate to assume that ethanol FFVs will primarily use E85, as there is no extra vehicle cost to purchase an FFV (typically a consumer does not choose between an FFV and a non-FFV of the same vehicle model), E85 fuel is no cheaper and in fact usually more expensive per mile, and use of E85 reduces overall vehicle range since there is only one fuel tank (as opposed to PHEVs and dual fuel CNG vehicles which have two fuel storage devices and therefore the use of the alternative fuel raises overall vehicle range). Further, even with approximately 10 million ethanol FFVs in the US car and light truck fleet, fuel use data demonstrate that ethanol FFVs only use E85 less than one percent of the time. EPA considers the comment from the Renewable Fuels Association about relative fuel prices to be without merit. While it is true that prices of all motor fuels can be volatile, CNG prices are approximately one-half those of gasoline[15] (and electricity prices, per mile, are even lower), and expected to remain low for the foreseeable future (and, if CNG prices do rise, it would likely lead to lower dual fuel CNG vehicle sales since the primary reason for interest in dual fuel CNG vehicles is to take advantage of lower fuel prices).

Several automakers and the Alliance of Automobile Manufacturers asked for prospective guidance from EPA with respect to the relative weighting of gasoline and E85 emissions performance for future FFVs, and specifically recommended that EPA base the relative weighting of gasoline and E85 emissions performance on the projected national average use of E85 in ethanol FFVs that will be necessary to support compliance with the Renewable Fuel Standard in future model years. EPA plans to issue guidance, well in advance of each model year, but this guidance will be based on demonstrated E85 sales data from previous years, rather than projections of future E85 volumes. EPA believes that there is too much uncertainty associated with projections of future ethanol market share (vis-à-vis the market share for non-ethanol renewable fuels) in order to be able to base future FFV gasoline and E85 weightings on projections of how the Renewable Fuel Standard market will evolve. Our approach is responsive to comments from automakers, the 25x'25 Alliance, and the National Corn Growers Association, in that if actual use of E85 and other higher-ethanol blends increases, for example in response to future RFS requirements and/or due to more competitive pricing, then the regulations and guidance will allow automakers to apply a higher E85 weighting consistent with the greater use of the fuel.

No incentive multiplier for ethanol FFVs

A few commenters suggested that ethanol FFVs be provided the same incentives as EV/PHEV/FCV/CNG vehicles, such as the incentive multipliers. EPA believes it is not

[15] http://www.afdc.energy.gov/afdc/pdfs/afpr_apr_12.pdf

appropriate to adopt incentive multipliers in this rule for manufacturers of ethanol-capable vehicles. One, ethanol is not a vehicle GHG emissions game-changer—the tailpipe GHG emissions of ethanol FFVs when operated on ethanol are typically only slightly lower than GHG emissions from conventional vehicles (and those GHG emissions performance-based reductions would be accounted for in EPA compliance calculations based on actual ethanol use). Two, ethanol FFVs do not face the same consumer barriers as EV/PHEV/FCV/CNG vehicles—they are typically no more expensive than conventional vehicles, and they can, and most often are, operated on conventional gasoline-based fuels. Furthermore, there are approximately 10 million ethanol FFVs on the road in the U.S. today (far more than any other incentivized vehicle technology), and automakers produced approximately 2 million ethanol FFVs in MY 2011 alone. Although, as explained in the preceding response, the great majority of ethanol FFVs currently use gasoline, there is little reason to believe that automakers are not going to continue to produce ethanol FFVs, particularly if more ethanol FFVs begin to use E85 fuel to meet the RFS standards. Given the long history of federal incentives for ethanol FFVs, and the fact that ethanol FFVs can achieve GHG emissions credits after the GHG emissions incentives expire, the Agency believes that there is no need to provide additional incentives for ethanol FFVs in this rulemaking, beyond those already provided. Providing an additional incentive in the MYs 2017-2025 GHG program thus would not achieve any greater use of renewable fuels than is already required under the RFS program, and thus would not achieve any greater emissions reductions from the use of such fuel. Providing incentives would therefore only dilute the benefits of the GHG emissions program. Given that renewable fuel use is already required by and accounted for under the RFS program, it therefore would be inappropriate to provide additional incentives in the MYs 2017-2025 program.

Nevertheless, with future ethanol FFV credits tied to the actual use of ethanol fuel, there will be, for the first time, a motivation for automakers to encourage their customers to use ethanol in their FFVs. See Section 6.6 for a discussion of why EPA is not using the 0.15 divisor for GHG emissions compliance, but is adopting the 0.15 divisor for the CAFE program beginning in MY 2020, for all nonpetroleum fuels.

<u>No accounting of potential upstream GHG emissions benefits due to ethanol/biofuels</u>

Several commenters pointed out that cellulose-based ethanol and other renewable fuels have the potential to yield large lifecycle GHG emissions benefits due to the CO_2 uptake during plant growth, and recommended that such fuels be given credits, or have compliance measured, to reflect the upstream GHG emissions benefits. The use of biofuels with lower lifecycle GHG emissions is already required under the Renewable Fuel Standard (RFS) program, which is designed to achieve GHG emissions benefits through the required use of renewable transportation fuels that have better lifecycle GHG emissions performance than the gasoline or diesel fuel that they displace. EPA has already quantified the GHG emissions benefits associated with the RFS program. Therefore, as noted above, providing an additional incentive in the MYs 2017-2025 GHG program, which is focused on emissions from the vehicle and not lifecycle emissions, would not achieve any greater use of renewable fuels than is already required under the RFS program, and thus would not achieve any greater emissions reductions from the use of such fuel. Thus, providing an additional incentive, or using lifecycle emissions for compliance, would reduce the need to take other actions and thereby reduce the emissions benefits of the

MYs 2017-2025 light-duty vehicle GHG emissions program given that renewable fuel use is already required by and accounted for under the RFS program.[16]

Interaction between this rule and the Renewable Fuels Standard

Many commenters alluded to a potential conflict between the proposed CAFE/GHG standards and the RFS program

EPA sees no such conflict. The MYs 2017-2025 GHG program is designed to achieve GHG emission reductions from vehicle operation as measured at the tailpipe. It does this by reducing the amount of fuel that the vehicle consumes during operation. For conventional gasoline powered vehicles, the standard is based on a test procedure that uses gasoline without any ethanol as the test fuel. The GHG standards will require the manufacturers to produce vehicles that consume less fuel when operated on gasoline. These same vehicles will also be more efficient when operated on blends of gasoline and ethanol. The standards achieve greater efficiency in the consumption of the fuel, without affecting one way or the other how much renewable fuel is used by the operator. The RFS program is a separate, complementary program designed to increase the use of renewable fuels by operators and to achieve GHG emission reductions primarily through upstream emission reductions. It affects what fuels are produced and sold, but does not affect how efficient the vehicle is in consuming the fuel. The GHG standards affect the vehicles and improve their efficiency, while the RFS program achieves the goals of increased use of renewable fuels independent of the vehicle GHG standards. They are separate but complementary programs.

In addition, the RFS provisions themselves were drafted by Congress to include lifecycle GHG performance standards that were neutral to the type of fuel used to meet them. Other than subcategories for cellulosic biofuel and biomass-based diesel, EISA does not specify what types of renewable fuel must be used. Rather, it is structured to allow the free market to stimulate the development of a broad range of renewable fuels from an even broader range of feedstocks. We have already seen rapid growth in corn ethanol and soy biodiesel production, and by leveraging DOE and USDA programs we are now seeing billions of dollars spent in research, development, and now commercialization of “drop-in fuels” such as renewable diesel, biomass-to-liquids gasoline and diesel, and biobutanol, as well as biogas and bioelectricity. These fuels are and will be coming from an ever broader array of feedstocks, from municipal solid waste to corn stover to algae. EPA already has over 30 petitions for new fuel pathways under the RFS program that we are currently reviewing. These fuels are also finding markets beyond just cars and trucks, and are being introduced into planes, trains, ships, and home furnaces. In short, the opportunities for the use of non-ethanol renewable fuels that will meet the requirements of the RFS program are expanding quickly.

[16] The plant oil-based fuel produced by POP Diesel is not currently identified as an acceptable renewable fuel under the RFS program. EPA is currently considering the company’s petition seeking approval of its product under the RFS program. The RFS program established by Congress is the appropriate mechanism for evaluating the full lifecycle emissions impact of this type of biofuel use, rather than a program focused principally on vehicle tailpipe emissions.

The commenters focus narrowly on ethanol as the fuel to be used to meet the RFS standard, since ethanol has been the predominant renewable fuel used to date. Since the RFS standard increases over time, they then argue that EPA must provide additional mechanisms to ensure that gasoline blends with greater than 10% ethanol can be used in both conventional vehicles and flexible fuel vehicles. However, the commenters presume that additional EPA action is necessary in order for this to occur. While EPA has and will continue to take actions within its authority to help the marketplace achieve the RFS standards through the increased use of ethanol and all other renewable fuels, ultimately EISA places this responsibility on the parties obligated to do so under the RFS program. This makes sense, as the industry is not only capable of making all the changes necessary to accommodate both the CAFE/LDGHG standards and the RFS volume requirements, but is in the best position to do so in the most efficient manner. For instance, in addition to developing drop-in fuels, the marketplace has been also been finding ways to increase the use of ethanol. As a result of the commitment of the big 3 domestic vehicle manufacturers to the President several years ago, there are now over 10 million flexible fuel vehicles (FFVs) on the road capable of burning up to 85 percent ethanol. Similarly, hundreds of new retail outlets are being converted every year to market E85 to supply higher level ethanol blends to FFVs.

Thus, there are already a wide variety of solutions available to the market that will permit the increasing use of renewable fuels to meet the RFS standards. Many, if not all of these solutions will be implemented in the marketplace over the course of the next few years. By the time the CAFE/LDGHG standards will be implemented for MY2017 and later, the market will have sorted out the best mechanisms to expand the use of renewable fuels through both increased use of ethanol and non-ethanol renewable fuels. Given the long lead time for this rule, the long phase-in, and the long time it will take for the fleet to turn over, we have every confidence that the market will assure compliance with both the RFS standards and CAFE/LDGHG standards without the need of incentives in this rule.

Finally, while the current incentives for production of FFVs have not been effective at increasing the use of renewable fuels by FFVs, the provisions of this rule have the potential to provide an incentive for manufacturers to continue production of FFVs and to promote increased use of renewable fuels by operators of FFVs, which would help to achieve the RFS volume standards.

6.4. Comments Regarding the Treatment of Diesel-Fueled Vehicles

Organizations Included in this Section

BMW of North America, LLC
Chrysler Group LLC
Delphi Corporation
Manufacturers of Emission Controls Association (MECA)
Marz, Loren C.
Plant Oil Powered Diesel Fuel Systems, Inc.
U.S. Coalition for Advanced Diesel Cars
Volkswagen Group of America

Organization: BMW of North America, LLC

The joint draft TSD assumes almost negligible diesel market share in 2021 to 2025 (control case) which is in contradiction to increasing customer acceptance of diesel technology and automaker efforts to improve diesel technology. Clean diesel technology is a further option in the list of technologies with significant CO_2 reduction potential. Future diesel mix depends on factors such as incentives, customer acceptance, fuel price development, etc. [EPA-HQ-OAR-2010-0799-9579-A1, p.9]

Organization: Chrysler Group LLC

Diesel technology can provide significant greenhouse gas and fuel efficiency benefits.

We also request that the Agencies consider incentives for this technology such as volume multipliers, or credit for enabling the use of biofuel blends such as B10 or B20. [EPA-HQ-OAR-2010-0799-9495-A1, p.22]

Organization: Delphi Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 111.]

Second, Delphi has a proven track record in achieving energy and emissions reductions in diesel technology. Specifically, Delphi's direct injection fuel systems and linear oxygen sensors support diesel combustion with urea dosing systems, ammonia sensors and particulate matter or soot sensors help meet stringent emissions and on-board diagnostic requirements.

Organization: Manufacturers of Emission Controls Association (MECA)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 181.]

Advanced diesel emission control technologies like particulate filters with lower backpressure characteristics, selected reduction catalysts with improved performance at lower exhaust temperatures and SCR catalysts coated directly on particulate filter substrates are examples of emerging diesel emission control technologies that will allow future diesel powertrains to not only be as clean as gasoline engines from a criteria pollutant perspective, but diesel powertrains will deliver improved fuel consumption characteristics and lower greenhouse gas emissions. The use of diesel particulate filters also delivers significant reductions in black carbon emissions from diesel engines, a combustion emission that also has important climate change impact.

Organization: Marz, Loren C.

The projected effectiveness of advanced diesel engine technology relative to advanced gasoline engine technology may potentially be underestimated. A cursory review of current diesel technology compared to current turbo-GDI technology in Europe reveals that diesel technology retains a significant fuel consumption advantage over identical vehicles with turbo-GDI technology in most cases. The following is a list of identical European-spec vehicles available with diesel and turbo-GDI technology at equivalent or nearly equivalent performance (based on 'combined' fuel consumption in the European test cycle (NEDC) and manufacturers' listed 1-100 km/hour times where those values were readily available (time in parentheses for each vehicle; diesel version listed first))... [NHTSA-2010-0131-0213-A1, p.1]

Audi A8 3.0 TDI – 6.6 l/100 km (6.1 sec) (27.5% lower Fuel Consumption)

Audi A8 3.0 TFSI – 9.1 l/100 km (6.1 sec)

MB S350 CDI BlueTEC L – 6.2 l/100 km (7.1 sec) (19.5% lower FC)

MB S350 CGI Blue Efficiency L – 7.7 l/100 km (7.1 sec)

MB C350 CDI Blue Efficiency – 5.9 l/100 km (6.0 sec) (15.7% lower FC)

MB C350 CGI Blue Efficiency – 7.0 l/100 km (6.0 sec)

MB C250 CDI Blue Efficiency – 4.8 l/100 km (7.1 sec) (28.4% lower FC)

MB C250 CGI Blue Efficiency – 6.7 l/100 km (7.2 sec)

Audi A3 2.0 TDI – 4.9 l/100 km (7.6 sec) (24.6% lower FC)

Audi A3 1.8 TFSI – 6.5 l/100 km (7.5 sec)

BMW 520d – 4.7 l/100 km (8-speed auto) (8.1 sec) (26.6% lower FC)

BMW 520i – 6.4 l/100 km (8-speed auto) (8.0 sec)

BMW X3 35d – 6.1 l/100 km (8-speed auto) (5.8 sec) (30.7% lower FC)

BMW X3 35i – 8.8 l/100 km (8-speed auto) (5.7 sec)

BMW 640d – 5.4 l/100 km (8-speed auto) (5.5 sec) (28.9% lower FC)

BMW 640i – 7.6 l/100 km (8-speed auto) (5.4 sec)

BMW 530d – 5.3 g l/100km (8-speed auto) (6.0 sec) (30.3% lower FC)

BMW 535i – 7.6 g l/100 km (8-speed auto) (5.9 sec)

MB E250 CDI Blue Efficiency – 4.9 l/100 km (7.5 sec) (25.8% lower FC)

MB E250 CGI Blue Efficiency – 6.6 l/100 km (7.7 sec)

BMW X5 40d – 7.5 l/100 km (8-speed auto) (6.6 sec) (25.7% lower FC)

BMW X5 35i – 10.1 l/100 km (8-speed auto) (6.8 sec)

Audi A8 4.2 TDI – 7.6 l/100 km (5.5 sec) (20.0% lower FC)

Audi A8 4.2 TFSI – 9.5 l/100 km (5.7 sec)

BMW 120d – 4.4 l/100 km (7.3 sec) (21.4% lower FC)

BMW 118i – 5.6 l/100 km (7.5 sec)

VW Golf 2.0 TDI – 4.8 l/100 km (manual) (9.3 sec) (22.6% lower FC)

VW Golf 1.4 TSI – 6.2 l/100 km (manual) (9.5 sec)

BMW 535d xDrive – 5.7 l/100 km (8-speed auto) (5.5 sec) (28.8% lower FC)

BMW 535i xDrive – 8.0 l/100 km (8-speed auto) (5.8 sec)

(ave. ~25.1% lower FC)

[NHTSA-2010-0131-0213-A1, pp.1-2]

Interestingly, this is very close to the relative fuel consumption reduction that the National Academies found (25.25%) in their recent study (“Assessment of Fuel Economy Technologies for Light-Duty Vehicles.” Committee on the Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy, Board on Energy and Environmental Systems Division on Engineering and Physical Sciences, National Research Council of the National Academies, Table 5.A.1). [NHTSA-2010-0131-0213-A1, p.2]

National Academies also conclude in this report...

'...An important characteristic of CI diesel engines is that they provide reductions in fuel consumption over the entire vehicle operating range, including city driving, highway driving, hill climbing, and towing. This attribute of CI diesel engines is an advantage when compared with other technology options that in most cases provide fuel consumption benefits for only part of the vehicle operating range....' (Finding 5.3) [NHTSA-2010-0131-0213-A1, pp.2-3]

This conclusion is generally supported by a study conducted by Motor Trend Magazine in 2007 (http://www.motortrend.com/features/112_0705_alternative_fuel_technology/viewall.html), which showed that, based on its results, the diesel technology vehicle (a Mercedes-Benz E320 Bluetec) was the most fuel efficient ('work efficient') of the technologies it studied (gas-electric hybrid technology represented by a Toyota Camry Hybrid, 'E85' technology represented by a

Chrysler Sebring, and turbo-GDI technology represented by a VW Passat 2.0T), and was very close to the Camry Hybrid in 'carbon efficiency'. [NHTSA-2010-0131-0213-A1, p.3]

It should be noted that the fuel consumption gap between the European-spec BMW 535d and 535i has actually widened (from 27.4% to 28.9% for the 2012 model). On top of that, the performance gap between the 535d and 535i has increased to 0.4 seconds (0-100 km/hr) in favor of the diesel (5.5 sec vs. 5.9 sec) from 0.2 seconds (5.9 sec vs. 6.1 sec) from the previous versions, according to the manufacturer's data (http://www.bmw.co.uk/bmwuk/pricesandspecifications/0,,1156___bs-NQ%3D%3D%40bb-TEkxMA%3D%3D%40sit-bmwuk,00.html). The BMW GDI technology was specifically identified in the Draft Joint Technical Support Document supporting this proposed rule as already having advanced turbo-GDI technology (Section 3.4.1.5, Variable Valve Lift (VVL), page 3-80). [NHTSA-2010-0131-0213-A1, p.3]

It is interesting to note that the BMW 535d has lower fuel consumption (and CO_2 emissions) than the BMW 5-Series hybrid ('ActiveHybrid 5') in the combined European test cycle (NEDC), in addition to significantly better 0-100 km/hr performance based on the preceding BMW link. This, in addition to the two examples in the U.S. of diesel and hybrid technology available in the same vehicle (Mercedes-Benz S350 Bluetec/S400 Hybrid and VW Touareg TDI/Hybrid) in which the diesel versions have better fuel economy than the hybrid versions in the EPA 5-cycle, suggests that the assumption that hybrid technology is a more fuel efficient technology than diesel technology is not unequivocal. [NHTSA-2010-0131-0213-A1, p.3]

According to specification data provided in a BMW publication ('BMW Technology Day 2009 - EfficientDynamics'), the minimum brake specific fuel consumption (BSFC) of the BMW 3.0 liter, 225 kW 'TwinPower' turbo-GDI engine is 245 g/kWh, while the minimum BSFC of the previous version of the 3.0 liter, 225 kW 'TwinPower' diesel engine was 197 g/kWh (pages 28 and 34, respectively). That would equate to an efficiency gap of at least 24.3% (and gasoline contains slightly more energy per unit mass than diesel fuel according to Argonne National Laboratory's GREET model), and that efficiency advantage has apparently widened even more for the 2012, 230 kW version of the BMW 'TwinPower' diesel engine. According to the referenced spec data, the 'TwinPower' turbo-GDI gasoline engine incorporates many advanced GDI engine technologies, e.g., 'jet guided' high precision injectors, 200 bar injection pressure, variable intake valve lift adjustment ('VALVETRONIC') and infinite intake and outlet camshaft adjustment ('dual-VANOS'), and 'twin-scroll' turbocharger technology. [NHTSA-2010-0131-0213-A1, p.3]

One Automotive Industry (AID) executive describes the fuel efficiency of gasoline engines as having improved by 3.5 percent over the past few years as a result of a shift to turbo-GDI technology, but the fuel efficiency of diesel engine technology has improved by 7 percent over the same time frame (http://www.wintonsworld.com/cars/carnews/carnews-2011/Diesels-Poised.html). He also points out that turbo gasoline cars are 'remarkably thirsty' in the real world and generally do not meet their claimed fuel economy levels. [NHTSA-2010-0131-0213-A1, p.4]

Bosch has projected that the efficiency of diesel engine technology will increase even more than gasoline engine technology (Climate and Transportation Solutions: Findings from the 2009

Asilomar Conference on Transportation and Energy Policy, Chapter 10: 'The Case for Diesel Cars To Reduce Greenhouse Gas Emissions.' by Johannes-Joerg Rueger; 'The internal-combustion engine of the future: Excellent economy and high power despite smaller size.' Dr. Rolf Leonhard, Executive Vice President Engineering, Diesel Systems, Presentation at the 59th International Automotive Press Briefing, Boxberg, June 2009). This appears reasonable since FEV has identified the potential for extremely high power density for diesel technology (>100 kW/liter - http://www.greencarcongress.com/2011/04/fev-20100405.html#more) which may allow as aggressive of downsizing as is assumed for advanced turbo-GDI in the proposed rule. [NHTSA-2010-0131-0213-A1, p.4]

Whether advanced turbo-GDI technology can close the fuel consumption gap on advanced diesel technology as much as estimated in the proposed rule seems very optimistic and speculative. Furthermore, if diesel technology is capable of improving as much as Bosch estimates, it will rival the other technologies considered in terms of fuel economy, especially if combined with hybrid technology. [NHTSA-2010-0131-0213-A1, p.4]

EPA officials have reportedly stated that a diesel penetration of just 33% could reduce U.S. fuel consumption enough to eliminate the need to import the amount of crude oil currently imported from Saudi Arabia (http://www.businessweek.com/magazine/content/06_08/b3972138.htm). This penetration appears possible based on recent U.S. sales data showing that diesel 'take rates' are 39% in vehicles which offer diesel engines in addition to conventional gasoline engines, while hybrid vehicles have a 'take rate' of only about 5% in vehicles in which hybrid technology is offered in addition to conventional gasoline engines (http://www.cleandieseldelivers.com/upload/CleanDieselDelivers_White_Paper.pdf - page 13). In the few vehicles in the U.S. that are currently offered with all three of these technologies (gasoline, diesel and hybrid technology - the Mercedes-Benz S-class and the VW Touareg SUV), the diesel versions are easily outselling the hybrid versions (http://www.hybridcars.com/news/december-2011-dashboard-sales-still-climbing-35093.html) and in the case of the Touareg, the diesel model has recently been outselling the hybrid and gasoline versions combined. It should be noted that this sales mix occurred in a month (December 2011) in which the price gap between regular gasoline and diesel fuel increased to over $0.50/gallon (national average per EIA). [NHTSA-2010-0131-0213-A1, p.4]

Many alternate diesel fuels ('synthetic' diesel fuels) are nearly carbon neutral when produced from biomass. According to Argonne National Laboratory's latest version of the GREET model released in October 2011 (GREET1_2011 - http://greet.es.anl.gov/), dimethyl ether (DME) produced from biomass would generate about 11 grams/mile well-to-wheel (WTW) net GHG emissions in the default diesel vehicle assumed in GREET, compared to 451 g/mi for the baseline gasoline vehicle, 333 g/mi for an equivalent electric vehicle (EV) based on the assumed U.S. electricity mix in GREET, and 253 g/mi for a fuel cell vehicle (FCV) using gaseous hydrogen. Renewable diesel fuel produced from biomass using the Fischer-Tropsch process (BTL) is not far behind DME at about 36 g/mi net WTW GHG emissions. BTL renewable diesel fuel is a direct 'drop-in' replacement for petroleum diesel fuel, is infinitely miscible with petroleum diesel fuel, and precludes the need to adopt an entirely new fuel distribution system. Even the diesel vehicle using first-generation biodiesel (B20) produced from virgin soybean oil generates lower net WTW GHG emissions than EV per GREET (~329 g/mi). [NHTSA-2010-0131-0213-A1, p.5]

California also has identified biodiesel from 'Conversion of corn oil, extracted from distillers grains prior to the drying process, to biodiesel' as having the lowest 'carbon intensity' of all of the fuel pathways it has identified in its latest 'carbon intensity lookup table', much lower than either the assumed electricity mix in California or any of the hydrogen fuels. This implies that the WTW GHG emissions from this source of biodiesel would be significantly lower than EV/PHEV/FCV, even taking the much higher 'fuel mileage' of those technologies into account. [NHTSA-2010-0131-0213-A1, p.6]

GREET1_2011 shows that for most fuel pathways identified in GREET, WTW emissions of criteria pollutants are generally lower for diesel technology/diesel fuel pathways than other vehicle technology/fuel pathways, through at least 2020. Furthermore, GREET1_2011 projects that DME produced from biomass produces the best overall well-to-wheels energy efficiency (of the biomass-based fuels - D. Kittelson et al, “Performance and Emissions of a Second Generation Biofuel – DME.” (2010), http://www.me.umn.edu/centers/cdr/reports/E3_Kittelson.pdf), petroleum and fossil fuel consumption reductions, GHG emission reductions, and arguably the greatest across-the-board criteria pollutant emission reductions of any other combination of fuel pathways and vehicle technologies identified in GREET through at least 2020, including any of the 'advanced vehicle technologies' identified in the proposed rule as receiving special incentives. Again, BTL is very close to DME with respect to aforementioned reductions. Diesel engine technologies will be required to take advantage of these advanced biofuels, and should be encouraged to the greatest extent possible. [NHTSA-2010-0131-0213-A1, p.6]

Diesel vehicles have substantially lower hydrocarbon emissions than gasoline vehicles, both directly and indirectly. EPA has mentioned in previous reports that diesel technology has '...near-zero evaporative hydrocarbon emissions due to the extremely low vapor pressure of diesel fuel....' (e.g., 'Progress Report on Clean and Efficient Automotive Technologies Under Development at EPA - Interim Technical Report.' January 2004, page 19). This appears to be a very important characteristic in light of the DOE/NREL 'weekend ozone effect' studies which suggest that hydrocarbon emissions are a more important factor in the accumulation of ground-level ozone than NO_x emissions in urban locations. Many studies (e.g., Eric Fujita et al, 'Weekend/Weekday Ozone Study in the South Coast Air Basin.' Proceedings of the 2002 DEER Conference; John G. Watson et al, “Review of volatile organic compound source apportionment by chemical mass balance.” Atmospheric Environment, Volume 35, Issue 9, March 2001, Pages 1567-1584; Heidi Hellén et al, “Determination of source contributions of NMHCs in Helsinki (60°N, 25°E) using chemical mass balance and the Unmix multivariate receptor models.” Atmospheric Environment, Volume 37, Issue 11, April 2003, Pages 1413-1424; Steven G. Brown et al, “Source apportionment of VOCs in the Los Angeles area using positive matrix factorization.” Atmospheric Environment, Volume 41, Issue 2, January 2007, Pages 227-237) have shown that gasoline exhaust and evaporative emissions from gasoline fuel (with evaporative emissions being implicated as an increasingly more important source in latter studies) account for a majority of hydrocarbon emissions in metropolitan areas where ground-level ozone is most problematic. Diesel technology along with EV and FCV technology could have a dramatic impact on improving air quality in metropolitan areas. [NHTSA-2010-0131-0213-A1, p.6]

Associated with this property of gasoline (relatively high evaporation rate) is the utter waste of a very valuable resource (petroleum) through evaporation, which would be mitigated by at least a partial switch of the U.S. light-duty fleet to diesel technology. Based on Table 4-12 (page 4-42) of the Draft Joint Technical Support Document supporting this proposed rule, 'Conventional Gasoline' produces about 5.70 grams of VOC per gallon well-to-pump (WTP), while 'Low Sulfur Diesel' produces about 0.95 grams of VOC per gallon WTP, using the GREET default BTU/gallon values for gasoline and low sulfur diesel fuel. According to EIA (http://www.eia.gov/energyexplained/index.cfm?page=oil_home#tab2), 378 million gallons/day of gasoline are consumer in the U.S. Assuming most of this consumption is by motor vehicles, that's about 138,000,000,000 gallons of gasoline consumed by the U.S. vehicle fleet per year. 138,000,000,000 gallons X 5.70 g/gal = 867,063 tons of VOC WTP per year from the fuel gasoline. Switching just 33% of the light-duty vehicles in the U.S. to diesel could reduce WTP VOC emissions to (0.67 X 138,000,000,000 gallons X 5.70 g/gal) + (0.33 X 138,000,000,000 gallons X 0.95 g/gal) = 628,621 tons. 867,063 tons - 628,621 tons = 238,442 tons or almost 80,000,000 gallons of gasoline not evaporated as VOC. This does not take into account the typically much lower fuel consumption of diesel vehicles, so assuming gasoline-hybrid technology and diesel technology achieve roughly the same fuel economy on average in the real world, as has been addressed previously, 80,000,000 gallons of gasoline/year would not only not be wasted, but would not contribute to ozone formation in VOC-limited areas, even in the case of gasoline-hybrid technology vehicles, for which special incentives are being proposed in this proposed rule. This also does not take into account the demonstrably higher VOC emissions of gasoline vehicles during vehicle refueling, diurnal + hot soak, and running loss. [NHTSA-2010-0131-0213-A1, p.7]

If the goal of the proposed rule is to increase fuel economy and reduce greenhouse gas emissions (and not increase emissions of some criteria pollutants in the process), diesel technology is a more effective strategy than GDI, and as potentially 'game-changing' a technology as gasoline-hybrid, and even EV, PHEV and FCV technology, possibly even more so in some cases. There is no logical reason that diesel technology shouldn't be afforded the same consideration as any other of the 'advanced technologies'. Preferably, no artificial incentives should be given to any of the technologies considered and all should just stand on their own merits. I urge EPA/NHTSA to reconsider the special incentives proposed for EV/PHEV/FCV/gasoline-hybrids, or at least put diesel technology on a level playing field with these technologies. [NHTSA-2010-0131-0213-A1, p.9]

As a disclaimer, I am in no way associated with the auto industry or any support industries to the auto industry, including diesel engine manufacturers. [NHTSA-2010-0131-0213-A1, p.9]

Organization: Plant Oil Powered Diesel Fuel Systems, Inc.

2. The Proposed GHG Standards are arbitrary and capricious because their exclusive consideration of tailpipe GHG emissions fails to take into account the relative life cycle contribution to GHG emissions of various engine technologies and the energy sources that make them run. The analysis of the wells-to-wheels energy inputs associated with various technologies and fuels set forth herein demonstrates that the Proposed Regulations' apportionment of GHG credits to various technologies and fuels is irrational because it considers only tailpipe emissions. [EPA-HQ-OAR-2010-0799-10337-A2, p. 2]

c. re-do the weight the Agencies give to various alternative technologies and fuels according to a wells-to-wheels approach that corresponds more accurately with their relative contribution to and mitigation of atmospheric greenhouse gas accumulation; [EPA-HQ-OAR-2010-0799-10337-A2, pp. 2-3]

Although the Renewable Fuel Standard provides incentives for the use of fuels covered by it, such as biodiesel, which may have a lower life cycle emissions of carbon than petroleum, such as biodiesel, pure plant oil is not eligible for the RFS. Therefore, the Proposed Regulations do not provide any incentive for the use of 100 percent plant oil or an engine specially equipped to run on this fuel. [EPA-HQ-OAR-2010-0799-10337-A2, p. 6]

In considering only tailpipe emissions, rather than the full life cycle GHG emissions of a technology and fuel that would result from a wells-to-wheels analysis, the Proposed Regulations arbitrarily favor and disfavor some alternatives over others. The net effect is that the Proposed Regulations are not rationally related to their purpose of reducing or slowing global warming. Following is factual analysis of the wells-to-wheels attributes of the relevant alternative technologies and fuels, pointing to the idiosyncratic and counter-productive values that the Proposed Regulations assign to them insofar as they mitigate GHG emissions. [EPA-HQ-OAR-2010-0799-10337-A2, p. 6]

Organization: U.S. Coalition for Advanced Diesel Cars

A national policy that favors specific technologies will prevent America from achieving dramatic petroleum reduction in the near- and medium-term. By favoring leap-ahead technologies that will not see significant market penetration even by the end of this proposed rule's term, the Administration is choosing a revolutionary path based on assumptions and uncertainties instead of an evolutionary path that will achieve similarly dramatic petroleum and emission reductions TODAY at a comparatively minimal cost to the consumer and avoid tremendous infrastructure costs. [NHTSA-2010-0131-0246-A1, p.1]

Focusing on Fuel Savings, Not Market Challenges: The NPRM goes on to state that diesel engines are not "advanced technology" per se" (FR 25454). In reality, diesel is the number one selling advanced CO_2 reduction technology sold in the world and is responsible for billions of gallons saved annually. Diesel technology combines high consumer acceptance – both in the United States and abroad - high residual values, high demand among used vehicle buyers and real-world fuel saving performance that is aligned with consumer expectations. [NHTSA-2010-0131-0246-A1, p.6]

In 2006, EPA confirmed the benefit of clean diesel vehicles when it stated that if 33% of America's vehicles were diesel-powered cars, the nation's fuel savings would be equal to the amount of fuel America imports from Saudi Arabia. Yet, the NPRM's analysis and commentary discount the role clean diesel vehicles are already playing to reduce national emissions and fuel consumption. [NHTSA-2010-0131-0246-A1, pp.6-7]

CAFE credits offered in the NPRM will bring some of these future technologies to market, but will not meet the Administration's expectations in changing the American vehicle fleet for several decades. [NHTSA-2010-0131-0246-A1, p.14]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 238-239.]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 240.]

To ensure that we spur not only innovation but broad innovation that will include multiple technology paths, public policies, regulations and incentive plans must be technology neutral. Government should set the goals, even aggressive goals, that inspire the freedom to innovate, and then get out of the way. State, federal and public officials and regulators must resist the temptation to pick winners and losers; to let politics and fads enter the debate or to engage in centralized planning in a highly complex industry.

Organization: Volkswagen Group of America

Volkswagen anticipates that some stakeholders will propose to include hybridization technologies as applied to all vehicles. Building upon this, Volkswagen proposes that the agencies adopt the following:

- Credits for deployment of advanced technology compression ignition engines as applied to both passenger cars and light duty trucks

- Credits for vehicles capable of operating on advance bio-fuels such as B20 (Biodiesel)

- Credits to promote combinations of expensive high-investment technologies such as electrification of vehicles incorporating advanced compression ignition or bio-fuel capable engines

Many technologies which deserve crediting may serve as 'bridging technologies' capable of providing near- and mid-term CO_2 reductions until such time as technologies and market demand for other more effective concepts mature. [EPA-HQ-OAR-2010-0799-9569-A1, p. 28]

Response:

EPA OMEGA Model does not project significant diesel market penetration

Comments from BMW and Loren Marz suggest that EPA's OMEGA model was pessimistic in its projections of diesel market penetration and that this is inconsistent with increasing consumer acceptance and market share for diesel vehicles. EPA emphasizes that the OMEGA model is designed to project the most cost effective way, not to mandate a compliance pathway, for automakers to meet the EPA GHG emissions standards. It is not designed to account for all of the complex elements that, in the aggregate, will determine future market share for any individual technology, whether conventional gasoline vehicles, electric vehicles, or diesel vehicles. Manufacturers remain free to choose any means of compliance, which of course includes use of diesel vehicles. For more discussion of diesel technology issues, see Section 12.2.

No incentive multiplier for diesel vehicles

Volkswagen, the U.S. Coalition for Advanced Diesel Cars, and Loren Marz suggested that diesel vehicles be provided the same incentives as EV/PHEV/FCV/CNG vehicles, such as the incentive multipliers. EPA believes it is not appropriate to adopt incentive multipliers in this rule for manufacturers of diesel vehicles. One, diesel technology is not a vehicle GHG emissions game-changer—the tailpipe GHG emissions of diesel vehicles are typically 10-20% lower than GHG emissions from conventional vehicles (of course, those lower values would be accounted for in EPA compliance calculations), while EV/PHEV/FCVs all have the potential for much larger game-changing GHG emissions reductions. Two, diesel vehicles do not face the same consumer barriers as EV/PHEV/FCV/CNG vehicles—diesel technology has been in the market for a long time, diesel fuel is available at a large number of fueling stations, and diesel vehicle range is higher than that of gasoline vehicles.

The related comments regarding technology neutrality and "government picking winners and losers" are addressed in Section 4.

No accounting of potential upstream GHG emissions benefits due to biodiesel (B20)

Volkswagen and Loren Marz suggested that credits should be available for vehicles that can operate on biodiesel blends, such as B20, since the biofuel portion of B20 has the potential to yield large lifecycle GHG emissions benefits due to the CO_2 uptake during plant growth. Likewise, Plant Oil Powered (POP) Diesel Fuel Systems criticized the proposal for considering only tailpipe GHG emissions and not accounting for lifecycle GHG emissions. The use of biofuels with lower lifecycle GHG emissions is already required under the Renewable Fuel Standard (RFS) program, which has been in place since 2006 and is designed to achieve GHG emissions benefits through the required use of renewable transportation fuels that have better lifecycle GHG emissions performance than the gasoline or diesel fuel that they displace. EPA has already quantified the GHG emissions benefits associated with the RFS program. Providing an additional incentive in the MYs 2017-2025 GHG program, which is focused on vehicle tailpipe emissions and not lifecycle emissions, would not achieve any greater use of renewable fuels than is already required under the RFS program, and thus would not achieve any greater emissions reductions from the use of such fuel. Thus, providing an additional incentive would reduce the emissions benefits of the MYs 2017-2025 light-duty vehicle GHG emissions program. Given that biofuel fuel use is already required by and accounted for under the RFS program, it therefore would be inappropriate to provide additional incentives in the MYs 2017-2025 program.

Finally, as noted in earlier responses, although the plant oil-based fuel produced by POP Diesel Fuel Systems is not currently identified as an acceptable renewable fuel under the RFS program, EPA is currently considering the company's petition seeking approval of its product under the RFS program. The RFS program established by Congress is the appropriate mechanism for evaluating the full lifecycle emissions impact of this type of biofuel use, rather than a program focused principally on vehicle tailpipe emissions.

6.5. Comments Regarding Other Alternative Fuels

Organizations Included in this Section

Alliance of Automobile Manufacturers
Association of Global Automakers, Inc. (Global Automakers)
Environmental Consultants of Michigan
Ford Motor Company
Manufacturers of Emission Controls Association (MECA)
Plant Oil Powered Diesel Fuel Systems, Inc.
St. Clair-Detroit River Sturgeon for Tomorrow

Organization: Alliance of Automobile Manufacturers

Credits for Other Alternative Fuel Vehicles [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

In the effort to continue the development of advanced technology vehicles, the Alliance would like to show support of the following technologies, which will help drive our country down the road toward energy independence. [EPA-HQ-OAR-2010-0799-9487-A1, p.68]

Dual-Fuel CNG and LPG Gasoline Vehicles [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

CNG and LPG vehicles are another option that our country has to diversify the vehicle fleet and use a domestically available energy source. The Alliance supports the development of a utility factor approach very similar to the SAE standard mentioned above for PHEVs. The Alliance is also in favor of the option to allow manufacturers to use the proposed utility factor-based methodology as a "pull-ahead" option for MYs 2012-2015. [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

Based on the added cost of the vehicle technology and the cost advantage of using CNG and LPG fuel relative to gasoline, customers that purchase a dual-fuel CNG or LPG vehicle will, to the extent possible, use the intended alternative fuel. [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

Many companies may leverage global designs in developing dual-fuel CNG and LPG vehicles for the U.S. market. It is important that the variety of global design features available be allowed into the U.S. market. Rather than making specific design requirements in the rules, a better approach would be have these design features be factors in the calculation of the CNG and LPG utility factors. The Alliance would like to propose a work group to discuss the constraints mentioned in the NPRM for dual-fuel CNG and LPG vehicles. [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

In the NPRM, EPA specifically requested comments on the merits of providing sales multiplier (similar to the EV/PHEV incentives) for dedicated and/or dual-fuel compressed natural gas vehicles. The Alliance believes CNG and LPG technology also deserve multipliers. [EPA-HQ-OAR-2010-0799-9487-A1, p.69]

The Alliance also supports EPA's proposal to continue use of the 0.15 divisor for gaseous and liquid alternative fuels and the petroleum equivalency factor for electricity. As noted by the Agencies, this approach will maintain consistency between dedicated and dual fuel vehicle calculations and will continue to encourage manufacturers to build vehicles capable of operating on fuels other than petroleum. [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

Organization: Association of Global Automakers, Inc. (Global Automakers)

Furthermore, Global Automakers supports the extension of multiplier incentives to other alternative fuels as well, such as liquid petroleum gas (LPG) or biodiesel. With regard to dual fueled vehicles in general, we urge the agencies to reconsider the treatment of these vehicles as part of the planned mid-term review of the standards, at which point the need for particular incentives would be clearer. Whatever approach is adopted, we urge that EPA and NHTSA agree on a single, harmonized set of incentives. [EPA-HQ-OAR-2010-0799-9466-A1, p. 7]

Organization: Environmental Consultants of Michigan

The Department of Energy lifecycle model demonstrates that switching to a renewable fuel using the Fischer-Thropsch process can achieve carbon neutrality without any change to the vehicle fleet. The Fischer-Thropsch 8 process has been used around the world since the 1920s to produce a very high quality diesel that can be used in existing vehicles. It can also be used to produce a high quality gasoline. The technology exists to produce fuels profitably at any crude oil price in excess of $17 per barrel of crude oil. This leaves sufficient room for a profitable switch to a renewable feedstock at today's oil prices. [NHTSA-2010-0131-0166-A1, p. 4]

---

8 This is not an ethanol fuel but a true, high quality gasoline and diesel product

Organization: Ford Motor Company

EPA further requested comment on the merits of providing similar multipliers for dedicated and/or dual fuel compressed natural gas vehicles. Ford supports providing multipliers for natural gas fueled vehicle, and further requests that the same multiplier be provided for dedicated and/or dual fuel liquefied petroleum gas vehicles. Both gaseous fuels provide substantial reductions in greenhouse gas emissions, as well as support the diversification of our energy supply, providing greater energy security. However, the vehicle technologies required to allow operation on these fuels is expensive, and the market availability of the fuel, similar to the availability of public charging stations for electric vehicles, remains very limited. Therefore, we believe that the multiplier is appropriate to encourage the investment in these technologies for broader new vehicles applications, and drive the volumes that will encourage greater investment in the necessary re-fueling infrastructure. We further recommend that the credit values for dedicated and bi-fuel gaseous vehicles be aligned with those provided for dedicated and bi-fuel electricity fueled vehicles. [EPA-HQ-OAR-2010-0799-9463-A1, p. 18]

Organization: Manufacturers of Emission Controls Association (MECA)

Emission controls for gasoline and diesel engines are also generally compatible with low carbon, alternative fuels (e.g., gasoline blends with renewable ethanol or biodiesel blends) that can provide additional reductions in mobile source greenhouse gas emissions. Engine operating strategies and emission control catalyst formulations, however, often need to be optimized depending on fuel composition to ensure that criteria pollutant emission standards are met. It is also important that specifications associated with any low carbon fuel should be compatible with the use of available exhaust emission control technologies. [EPA-HQ-OAR-2010-0799-9452-A3, p.3]

Organization: Plant Oil Powered Diesel Fuel Systems, Inc.

3. The Proposed GHG Standards are both inconsistent with law and arbitrary and capricious because they, and other EPA Regulations they incorporate by reference, fail to take into account in any respect the feasibility of equipping light duty engines to operate on 100 percent untransesterified plant oil. If EPA took such feasibility into account, an effective way to regulate GHG emissions would be to impose strict manufacturer GHG emissions averages that are independent of the corporate average fuel economy standards already in place for light duty vehicles. [EPA-HQ-OAR-2010-0799-10337-A2, p. 2]

d. recognize 100 percent plant oil as a viable renewable diesel engine fuel eligible to receive Renewable Identification Number (“RIN”) credits under the Renewable Fuels 2 standard (“RFS 2”);

e. grant POP DieselTM’s application, submitted separately, for a RIN pathway for 100 percent plant oil fuel; and [EPA-HQ-OAR-2010-0799-10337-A2, p. 3]

f. impose strict corporate fleet averages for GHG emissions on all classes of manufacturers as the most effective way to ramp down such emissions across the light duty market. [EPA-HQ-OAR-2010-0799-10337-A2, p. 3]

As set forth below, the Proposed Regulations’ treatment of the alternatives to fossil fuel petroleum in light duty vehicles will not have the effect of mitigating greenhouse gasses. As a result, even if the Proposed Regulations took into account the full scope of the rebound effect arising from reliance on improvements in fuel economy, which they do not do, they fail to establish a framework of incentives to "slow or reduce" Global Warming. Massachusetts v. EPA, 549 U.S. at 525, 127 S. Ct. at 1457. [EPA-HQ-OAR-2010-0799-10337-A2, p. 5]

Although the Renewable Fuel Standard provides incentives for the use of fuels covered by it, such as biodiesel, which may have a lower life cycle emissions of carbon than petroleum, such as biodiesel, pure plant oil is not eligible for the RFS. Therefore, the Proposed Regulations do not provide any incentive for the use of 100 percent plant oil or an engine specially equipped to run on this fuel. [EPA-HQ-OAR-2010-0799-10337-A2, p. 6]

In considering only tailpipe emissions, rather than the full life cycle GHG emissions of a technology and fuel that would result from a wells-to-wheels analysis, the Proposed Regulations arbitrarily favor and disfavor some alternatives over others. The net effect is that the Proposed Regulations are not rationally related to their purpose of reducing or slowing global warming. Following is factual analysis of the wells-to-wheels attributes of the relevant alternative technologies and fuels, pointing to the idiosyncratic and counter-productive values that the Proposed Regulations assign to them insofar as they mitigate GHG emissions. [EPA-HQ-OAR-2010-0799-10337-A2, p. 6]

E Biodiesel

The International Council on Clean Transportation ("ICCT") has determined that based on reliable analyses of the carbon intensity involved in manufacturing biodiesel, "replacing fossil diesel with biodiesel would not help to mitigate climate change, unless biodiesel could be produced entirely from wastes with no other use, crops grown on low value land [,] or some other policy could be put in place to substantially improve performance on emissions." ICCT Briefing: Biodiesel Carbon Intensity, Sustainability and Effects on Vehicles and Emissions (2012), at 5 ("ICCT Briefing") (Exhibit 5). The following ICCT chart depicting Biodiesel Total Emissions shows that the life cycle emissions of biodiesel derived from the most common triglyceride feedstocks are higher than they are for fossil fuel petroleum. [See chart on p. 11 of Docket number EPA-HQ-OAR-2010-0799-10337-A2] [EPA-HQ-OAR-2010-0799-10337-A2, p. 10]

Source: ICCT Briefing, at 5 (Exhibit 5).

High level officials in the diesel engine and petroleum industries agree that the manufacture of 100 percent plant oil fuel requires less energy input than biodiesel. Deposition testimony of the organizational representative of the Engine Manufacturers Association, Roger Gault (Exhibit 7) ("EMA by Gault testimony"), at 170, lines 12-16) ("[T[here's a relative cost between raw vegetable oil and biodiesel where biodiesel will by its nature be more expensive than raw vegetable oil because the raw vegetable oil is a component of the biodiesel that's produced"); declaration of Andrew L. Pickard, Ph.D., P. Chem. ("Pickard decl."), para. 3.6 (Exhibit 9)("An obvious advantage of using triglycerides (such as 'raw' vegetable oil) directly as fuel for diesel engines is that no energy is spent to convert the 'raw' feedstock into an alternative fuel such as biodiesel, and there are no by-products or waste products for disposal"). [EPA-HQ-OAR-2010-0799-10337-A2, p. 11]

The means to avoid the counter-productive carbon intensity of manufacturing biodiesel is to leave the triglyceride feedstock as Nature made it, 100 percent plant oil, and to run it through a diesel engine that is properly equipped to handle it. The only way that GHG Proposed Regulations for mobile sources will slow or reduce Global Warming is if they take into account the wells-to-wheels carbon intensity of all of the alternatives and reward or penalize them accordingly. Since the Proposed Regulations, instead, expressly reward technologies and fuels on the basis only of tailpipe emissions and they rely on other irrational assumptions, they fail accomplish the underlying objective. They are, therefore, arbitrary and capricious. [EPA-HQ-OAR-2010-0799-10337-A2, p. 12]

F. 100 Percent Plant Oil

The POP Diesel Fuel SystemTM, patented in 2011, may be installed after-market on any diesel engine to permit it to operate on 100 percent untransesterified plant oil. The engine starts and shuts down on No. 2 diesel drawn from the original tank, but in the interim, it runs on 100 percent plant oil coming from the auxiliary tank. This approach safeguards engine performance and preserves the cleanliness of the crankcase oil, obviating the need for any alteration to service intervals, other than monitoring of the plant oil fuel filter. The plant oil fuel is heated prior to injection to reduce its viscosity and better assure a finely atomized spray pattern and clean and efficient burn. [EPA-HQ-OAR-2010-0799-10337-A2, p. 12]

Aftertreatment equipment may even function better on plant oil fuel than No. 2 diesel, if biodiesel is any indication. A. William, S. Black, and R.L. McCormick, “Biodiesel Fuel Property Effects on Particulate Matter Reactivity,” DOE, National Renewable Energy Laboratory (“NREL”) (biofuel enhances diesel particulate filter function). [EPA-HQ-OAR-2010-0799-10337-A2, pp. 12-13]

POP DieselTM’s experience in installing its equipment on thirty experimental diesel engines of all stripes and sizes demonstrates that this solution can work on any engine. The feasibility of POP DieselTM’s basic plant oil technology is proven. Rudolph Diesel himself observed in 2012:

The use of vegetable oils for engine fuels may seem insignificant today. But such oils may become in course of time as important as the petroleum and the coal tar products of the present time. [EPA-HQ-OAR-2010-0799-10337-A2, p. 13]

A.K. Babu and G. Devaradjane, “Vegetable Oils and Their Derivatives as Fuels for CI Engines: An Overview, section 2, SAE 2003-01-0767 (Exhibit 8), at 0605. [EPA-HQ-OAR-2010-0799-10337-A2, p. 13]

1. Exclusion of Untransesterified Plant Oil from Eligibility for the RFS 2

Because the RFS does not apply to untransesterified plant oil fuel, POP DieselTM cannot formally petition for a pathway that would entitle its fuel to a RIN and to earn GHG-reducing, RIN credits. Therefore, the Proposed Regulations do not afford POP DieselTM the RIN credits benefit they contemplate for other biofuels that do qualify for the RFS and RFS 2. In this regard, the Proposed Regulations are arbitrary and capricious. POP DieselTM’s separate application for a RIN contains the life cycle information necessary for EPA to designate a pathway under RFS 2. [EPA-HQ-OAR-2010-0799-10337-A2, p. 13]

2. Institutional Barriers to Introduction of Plant Oil Fuel [EPA-HQ-OAR-2010-0799-10337-A2, p. 13]

Any plant oil consisting of triglycerides will work in a diesel engine equipped by POP DieselTM. Just as, depending on source, there are a variety of crude petroleum oils, there are a variety of plant oils that each have slightly different physical properties. “There is no question that” all of these plant oils are capable of powering a diesel engine. Sam Jones, and Charles Peterson, “Using Unmodified Vegetable Oils as a Diesel Fuel Extender,” U. Of Idaho (Exhibit 8, documents 0571 -0578). All of them will deliver undiminished engine performance and emissions comparable to No. 2 diesel in any diesel engine equipped by POP DieselTM. [EPA-HQ-OAR-2010-0799-10337-A2, pp. 13-14]

However, imprudent or illogical development of a standard for triglyceride fuel might unreasonably restrict the scope of feedstock qualifying for plant oil fuel. For this reason, POP DieselTM has opposed adoption of the first triglyceride standard specification by ASTM International, to govern this fuel’s use in commercial and industrial burners. An exposition of the unreasonable and unjustified barriers this standard erects to the use of triglyceride fuel in the diesel fuel market is beyond the scope of this petition. An antitrust lawsuit filed by POP DieselTM has, thus far, prevented ASTM from publishing this standard, which event would automatically make it, by law, the quality standard for triglyceride burner fuel in most states. Plant Oil Powered Diesel Fuel Systems, Inc. v. ExxonMobil, et al. (D.N.M. No. 1:11-cv-00103-JB-LFG) (filed Feb. 1, 2012) (see all versions of the complaint for enumeration of the Standard’s unreasonable and unjustified restrictions on triglyceride diesel fuel). [EPA-HQ-OAR-2010-0799-10337-A2, p. 14]

The gist of the antitrust allegations are as follows. The National Biodiesel Board (“NBB”) instigated the drafting of the ASTM triglyceride burner fuel standard to purposefully restrict the competing biofuel from undercutting its market. ExxonMobil used its dominance of ASTM’s Petroleum Products Committee, by expressly making a threat to vote against any triglyceride standard that did not include the unreasonable restrictions, to enforce this arrangement. (The biodiesel industry enjoys preferred status with the petroleum industry by virtue of the 5 percent blending of biodiesel with No. 2 diesel authorized by ASTM D-975, Standard Specification for Diesel Fuel Oils. This arrangement allows the petroleum industry to say to the public that it supports renewable energy.) ASTM’s Petroleum Products Committee approved the triglyceride burner fuel standard without subjecting any of the test methods applied therein to ASTM’s validation procedure that would normally apply to a new fuel. Pickard decl., para. 3.12 (Exhibit 9). [EPA-HQ-OAR-2010-0799-10337-A2, pp. 14-15]

An example of the problems that arise with applying test methods developed for No. 2 diesel to triglyceride fuel appears in the lab report that is Exhibit 10 (Confidential Business Information).1 ASTM Test Method D-1160 distillation “could not be completed beyond” 40 percent recovery “after 449 degrees C due to the sample forming a gel that stopped the distillation.” Id., footnote (Exhibit 10) (Confidential Business Information). This example calls into question the precision of all other ASTM petroleum and biodiesel test methods for use with triglyceride fuel, none of which have ever been validated for triglyceride fuel via an ASTM interlaboratory study (“ILS”), a comprehensive study involving replicate testing done at between six and nine laboratories. See Pickard decl., para. 3.12 (Exhibit 9). [EPA-HQ-OAR-2010-0799-10337-A2, p. 15]

The fact that there have not been any ILS’s conducted, much less successfully concluded, for any test methods for triglyceride fuel may make it premature for EPA to designate this fuel for registration under 40 C.F.R. part 79. See supra. In the absence of test methods validated for triglyceride fuel, a triglyceride fuel manufacturer, such as POP DieselTM, would not have benchmarks for determining if its fuel submitted for EPA registration was within specifications and EPA would lack rational means to evaluate the same question. [EPA-HQ-OAR-2010-0799-10337-A2, p. 15]

The antitrust allegations are, further, that the conspirators used deception to orchestrate ASTM’s development and passage of the triglyceride burner fuel standard. These allegations are that the NBB had a surrogate, Ralph Turner, who had previously served as the owner’s representative and managing agent of a 45 million gallon per year biodiesel facility, one of the largest in the United States, propose to ASTM the drafting of a triglyceride standard. On the pretext that Mr. Turner’s ostensibly having used around 4,000 gallons per year of raw vegetable oil to heat greenhouses on his farm gave him experience with triglyceride fuel, ASTM appointed him to serve as Technical Contact for the ASTM Subcommittee that undertook to draft the standard. The result has the primary effects of enshrining false shibboleths and unnecessarily crimping restraints into a precedent-setting ASTM triglyceride fuel standard, the laws of most states and possibly, federal law. [EPA-HQ-OAR-2010-0799-10337-A2, p. 16]

The federal district judge in New Mexico dismissed the antitrust lawsuit in July 2011 but conducted a three-hour hearing on POP DieselTM’s motion to reconsider in mid-December 2011. He has not issued his ruling yet on whether to reinstate this suit. [EPA-HQ-OAR-2010-0799-10337-A2, p. 16]

3. Overcoming Prejudice Against POP DieselTM’s Use of 100 Percent Plant Oil.

Two organizations, the Engine Manufacturers Association and the National Renewable Energy Laboratory, have issued public statements arguing against the use of vegetable oil as fuel in a diesel engine. As set forth below, both of these statements are unjustified and based on outdated data. [EPA-HQ-OAR-2010-0799-10337-A2, p. 16]

i. Engine Manufacturers Association Statement [EPA-HQ-OAR-2010-0799-10337-A2, p. 16]

Research on the use of raw vegetable oil running in a diesel engine dating to the 1970's and early 1980's found that it caused carbon deposits and other problems. EMA by Gault testimony (Exhibit 7) (referring to numbered documents that constitute Exhibit 8). As is evident from the testimony of the Engine Manufacturers Association’s representative Mr. Gault, this research, and nothing more recent than that, was the primary basis for EMA to adopt a statement in 2006 condemning the use of raw vegetable oil in a diesel engine. EMA statement (Exhibit 8, document 0566). [EPA-HQ-OAR-2010-0799-10337-A2, pp. 16-17]

Based on documents kept in the EMA's file concerning development of its position statement, the NBB's Steve Howell ("Mr. Howell") seemed to be the instigator of this statement. EMA by Gault testimony, at 171, lines 18-22 (Exhibit 7) (referring to Exhibit 8, documents numbered 0569, 0579, 0582, 0603 and 0604). As other documents in the same file indicate, Mr. Howell, on behalf of the biodiesel industry, also took the lead in agitating for EPA to impose additional restrictions on the use of 100 percent plant oil in a diesel engine. Exhibit 8, document 0582 (Mr. Gault's notes of teleconference organized in December 2005 by Mr. Howell with EPA officials Jim Caldwell, Dave Kortum and Joseph Sopata); document 0603 (text of email by Mr. Howell to EPA officials seeking meeting "on the subject of EPA registration of Straight Vegetable Oil or Raw Vegetable Oil"). [EPA-HQ-OAR-2010-0799-10337-A2, p. 17]

POP DieselTM does not advocate, in fact it shuns, the methods of use of plant oil in the failed research studies from the 1970's and early 1980's: either blending the vegetable oil with No. 2 diesel in a single tank, or else, using it at 100 percent concentration, but without the safeguards that POP DieselTM has learned are necessary. These necessary safeguards include: [EPA-HQ-OAR-2010-0799-10337-A2, p. 17]

1. Always starting the engine on 100 percent No. 2 diesel drawn from its own fuel tank, so as to prevent excessive blow-by of plant oil fuel past the cold piston rings into the engine crankcase, where it will polymerize and gum up the engine; [EPA-HQ-OAR-2010-0799-10337-A2, pp. 17-18]

2. Always shutting down the engine on 100 percent No. 2 diesel drawn from its own fuel tank, so that the plant oil fuel does not remain on the hot metal parts of the fuel injection system to sizzle and plasticize and so that, in cooler weather, the plant oil fuel does not congeal upon engine cool-down and then cause difficulty on engine start-up; and [EPA-HQ-OAR-2010-0799-10337-A2, p. 18]

3. Always flushing the engine and fuel system with 100 percent No. 2 diesel drawn from its own fuel tank prior to engine shut-down, to take advantage of this fuel's excellent properties as a solvent in removing plant oil from the internal fuel passages of the engine, where it may eventually gel. [EPA-HQ-OAR-2010-0799-10337-A2, p. 18]

In fact, more recent studies than the ones from the 1970's and early 1980's speak favorably of plant oil fuel. Jones, S. and Peterson, C., "Using Unmodified Vegetable Oils as a Diesel Fuel Extender," U. of Idaho (Exhibit 8, at 0575 (citing Nag et al. (1995) and Sapaum et al. (1996))). POP DieselTM has overcome the technical hurdles to warrant that the use of 100 percent plant oil in a diesel engine is absolutely feasible. [EPA-HQ-OAR-2010-0799-10337-A2, p. 18]The EMA position statement on the use of raw vegetable oil in a diesel engine is further suspect because the final draft omitted language included in earlier drafts that seemed to approve of a dual tank fuel system like POP DieselTM's: "Vehicles may be modified to achieve compatibility between raw vegetable oil and animal fats with the fuel delivery system (e.g., by heating the fuel system to reduce the fuel's viscosity)." Exhibit 8, document 0596. [EPA-HQ-OAR-2010-0799-10337-A2, p. 18]

ii. National Renewable Energy Laboratory Statement [EPA-HQ-OAR-2010-0799-10337-A2, p. 18]

Three sentences buried in NREL's Biodiesel Handling and Use Guide ("NREL statement"), at page 8, advise avoiding the use of untransesterified plant oil as diesel fuel. NREL statement (Dec. 2009) (Exhibit 11). Both the NREL and EMA statements turn on the conclusion that "the[] problems [with plant oil fuel] are caused mostly by the greater viscosity, or thickness, of the raw oils." NREL statement, at 8 (Exhibit 11). [EPA-HQ-OAR-2010-0799-10337-A2, pp. 18-19]

However, the fuel injection equipment manufacturer Bosch states that in contemporary, pressure-regulated common rail fuel systems, the higher viscosity of vegetable oil fuel does not exceed design thresholds for component strength. Dr. Jorge Ullmann and Dr. Heinz Stutzemberger, "Biofuels of the Future – Injection System Requirements in Terms of Quality," section 2.1, Robert Bosch GmbH (Nov. 2007) (Exhibit 12-A); deposition testimony of the organizational representative of Bosch, Tom Livingston, at page 74, lines 5-8 and 21-24 (Exhibit 12-B). [EPA-HQ-OAR-2010-0799-10337-A2, p. 19]

The NREL statement does not refer to any evidentiary source to justify its advisory against the use of plant oil fuel. NREL statement, at page 8 (Exhibit 11). The EMA statement refers as its only source to the conclusory NREL statement. EMA statement (Exhibit 8, document 0504). The organizational representative of the EMA, trying to justify the sweep of EMA's statement, could only cite to a single example of an engine that suffered a catastrophic – meaning sudden and disabling – engine failure, allegedly due to use of untranesterified plant oil in the engine. EMA by Gault testimony, at page 202, line 12 - page 203, line 4 (Exhibit 7). [EPA-HQ-OAR-2010-0799-10337-A2, p. 19]

The close ties that the NBB's Mr. Howell has with Robert McCormick, the director of NREL's Center for Transportation Technologies and Systems, are evident in the EMA's background file on the development of its statement. Mr. McCormick keeps Mr. Howell apprized of his communications with EPA on the subject of vegetable oil fuel. Exhibit 8, document 0569. The reader is left to speculate whether Mr. Howell asked Mr. McCormick to speak negatively to EPA about this fuel, as Mr. McCormick appears to have done in December 2005. Exhibit 8, document 0570 (Joe Sopata of EPA to Mr. McCormick: "You mentioned to me during the diesel subcommittee meeting that using vegetable oil at any level in a diesel engine would render the diesel engine inoperable within one year. Do you have any data on this issue?"). Mr. McCormick forwards to Mr. Howell research papers on the topic of plant oil fuel. Exhibit 8, document 0604. Mr. Howell uses Mr. McCormick's intelligence feed in the NBB's campaigns to get EMA and EPA to take action to inhibit the use of plant oil fuel. [EPA-HQ-OAR-2010-0799-10337-A2, pp. 19-20]

All of the foregoing communications occur, and the EMA and NREL adopted their statements condemning the use of raw vegetable oil as fuel based on, old, faulty evidence. [EPA-HQ-OAR-2010-0799-10337-A2, p. 20]

POP DieselTM agrees that the improper management of plant oil fuel may cause longer term problems in a diesel engine. This is no different from the fact that petroleum diesel fuel functioned less than optimally in compression ignition engines for years, until its properties and their behavior in the engine came to be better understood. ASTM D-975, Standard Specification for [Petroleum] Diesel Fuel Oils, was not adopted until 1948, four decades after the diesel engine came into wide usage on petroleum diesel fuel. Pickard decl., para. 2.9 (Exhibit 9). [EPA-HQ-OAR-2010-0799-10337-A2, p. 20]

Plant oil fuel is in its infancy, but POP DieselTM has shown that the technology to run it at 100 percent concentration is feasible and practical. Moreover, given life cycle GHG emissions that are better than the alternatives, plant oil fuel is particularly effective at reducing or slowing global warming. The Proposed Regulations ought to embrace this solution, rather than ignore it. The best way to embrace it would be for EPA to impose strict corporate fleet averages for GHG emissions that are divorced from fuel efficiency considerations and that take into account the full embodied energy and life cycle emissions inherent in the various engine technologies and fuels. This approach would allow EPA to fulfill its duty to ramp down GHG emissions with a certainty that is lost in the Agencies' false trust in fuel economy and myopic focus on tailpipe emissions, as embodied in the Proposed GHG Standards. [EPA-HQ-OAR-2010-0799-10337-A2, pp. 20-21]

1The fuel sample of jatropha plant oil used in this study had relatively high levels of phosphorous and sulfur. Normally, virgin plant oils have negligible quantities of these elements in them. The high levels got into the fuel sample through the use of fertilizer, herbicide or pesticide. The grower will alter its cultivation method to eliminate the presence of these elements in his extracted oil.

Organization: St. Clair-Detroit River Sturgeon for Tomorrow

We understand that smaller and lighter vehicles will be part of the equation to accomplish future fuel economy standards, however many of us drive larger, heavier vehicles used to tow boats, snowmobiles and travel trailers. We support the further development of alternative fuel sources such as bio-diesel which as renewable energy sources will help to reduce dependence on oil, will reduce emissions and will still allow us to drive vehicle suitable for towing and hauling. We are glad to see the plan is designed to ensure that we will still have a full range of vehicle choices. The development of alternative fuels will also help to control costs due to increasing global demand for diminishing fossil fuel resources. [EPA-HQ-OAR-2010-0799-4151, p. 1]

Response:

The Alliance of Automobile Manufacturers, Association of Global Automakers, and Ford recommended that incentive multipliers be available for manufacturers of liquefied petroleum gas (LPG) vehicles. EPA is not adopting incentive multipliers for LPG vehicles because the Agency does not believe that LPG vehicles promote the commercialization of technologies that have, or technologies whose commercialization can be critical facilitators of next-generation technologies that have, the potential to transform the light-duty vehicle sector by achieving zero or near-zero GHG emissions and oil consumption.

POP Diesel's comments regarding the merits of its product, and the (asserted) obstacles it has faced from competitive interests and others, is beyond the scope of this rulemaking. However, the comment that EPA should base compliance on fleet wide averaging is misplaced since this is precisely how compliance is measured for all manufacturers.

6.6 Comments Regarding Issues Relevant to Multiple Fuels

Organizations Included in this Section

Alliance of Automobile Manufacturers (AAM)
American Petroleum Institute (API)
Bosch
Motor & Equipment Manufacturers Association (MEMA)
Nissan North America, Inc.
Plant Oil Powered Diesel Fuel Systems, Inc.
Securing America's Future Energy (SAFE)

Organization: Alliance of Automobile Manufacturers

The Alliance also supports EPA's proposal to continue use of the 0.15 divisor for gaseous and liquid alternative fuels and the petroleum equivalency factor for electricity. As noted by the Agencies, this approach will maintain consistency between dedicated and dual fuel vehicle calculations and will continue to encourage manufacturers to build vehicles capable of operating on fuels other than petroleum. [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

Organization: American Petroleum Institute (API)

EPA and NHTSA Should Not Contravene the Will of Congress by Allowing an Unlimited Fleet Fuel Economy Credit for MY 2020 and Later Dual-Fueled Vehicles

EPA and NHTSA also are requesting comment on whether to continue to use the 0.15 divisor for CNG and ethanol, and the petroleum equivalency factor for electricity, both of which the statute requires to be used through MY 2019, for model years 2020 and later dual-fueled vehicles. The use of these factors in conjunction with the utility factor approach discussed above artificially and substantially inflates the fuel economy of dual-fueled vehicles and thus provides an incentive to the automakers to produce these for CAFE compliance purposes regardless of other consequences. In essence, the agencies are proposing that automakers may "…increase their calculated fleet fuel economy for dual-fueled vehicles by an unlimited amount using these flexibilities."16 However, Section 32906 of the Energy Independence and Security Act of 2007 (EISA 2007) phased-out the maximum fuel economy credit attributable to dual-fuel vehicles (except electric vehicles) that could be taken by manufacturers of those vehicles such that the credit was reduced from 1.2 mpg in model year 2014 (and previous model years) to 0.2 mpg in model year 2019 to "0 miles per gallon for model years after 2019" (Section 32906(a)(7)). Clearly, the EPA and NHTSA proposed treatment of model year 2020 and later dual-fueled natural gas vehicles is overly generous and inconsistent with the intent and will of Congress. It should be set aside. [EPA-HQ-OAR-2010-0799-9469-A1, p. 7]

It is also useful to note that for the many years that this CAFE credit incentive has been in place, dual-fueled vehicles (particularly those using natural gas) have continued to remain a negligible fraction of the fleet. In other words, the presence of the incentive has not contributed to the influx of dual-fueled CNG vehicles. (In fact, there are no OEM dual-fuel CNG vehicles offered today; only a few after-market conversion models.) [EPA-HQ-OAR-2010-0799-9469-A1, p. 7]

Organization: Bosch

EPA has proposed two options for the calculation for CAFE for alternative fuel vehicles in MY2020 and beyond (after expiration of the calculation specified in 49 U.S.C. 32905). The treatment of E85 FFV, CNG and electricity is called out specifically in the NPRM, however there are a number of other alternative fuels, such as renewable diesel, in the market today and under development. Bosch recommends, regardless of which calculation option the EPA should decide on, clarification that all types of alternative fuels, not only E85, CNG and electricity, are included and treated in an equivalent manner in the calculation. This recommendation applies to treatment of dedicated alternative fuel vehicles as well. [EPA-HQ-OAR-2010-0799-9462-A1, p. 4]

Organization: Motor & Equipment Manufacturers Association (MEMA)

All alternative fuels, such as biodiesel, must be considered equally and not limited to just E85, CNG and electricity. Dedicated alternative fuel vehicles should be treated equally, regardless of fuel type. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

Regardless of which option EPA decides to adopt for MY2020 and beyond, MEMA recommends that the agency clarify that all types of alternative fuels, such as biodiesel, are considered and treated equivalently in this CAFE calculation, and not only limit it to E85, CNG and electricity. In addition, MEMA believes that the treatment of dedicated alternative fuel vehicles should also be equivalent regardless of the alternative fuel type. [EPA-HQ-OAR-2010-0799-9478-A1, p.12]

All alternative fuels should be considered equally and not limited to just E85, CNG and electricity. [EPA-HQ-OAR-2010-0799-9478-A1, p.13]

Organization: Nissan North America, Inc.

Nissan Supports Continued Use of the Petroleum Equivalency Factor for CAFE Calculations in MYs 2020-2025 [EPA-HQ-OAR-2010-0799-9471-A1 p.24]

EPA proposes to continue to use the petroleum equivalency factor for MYs 2020 and later. Proposed Rule at 75,019. Nissan supports EPA's proposal to continue to use the petroleum equivalency factor for electricity in MYs 2020-2025, which is consistent with the purpose of the CAFE program-to reduce our country's dependence on foreign oil. See 65 Fed. Reg. 36,986, 36,986 (June 12, 2000) (establishing the petroleum equivalency factor). Not only is such an approach consistent with the purpose of the CAFE Program, continued use of the petroleum equivalency factor will incentivize manufacturers to invest in EVs and PHEVs, thereby increasing the rate of adoption of these technologies. [EPA-HQ-OAR-2010-0799-9471-A1 p.24]

Organization: Plant Oil Powered Diesel Fuel Systems, Inc.

b. de-couple fuel efficiency policy from GHG emissions policy, since they are distinct and the former is not a surrogate for the latter; [EPA-HQ-OAR-2010-0799-10337-A2, p. 2]

c. re-do the weight the Agencies give to various alternative technologies and fuels according to a wells-to-wheels approach that corresponds more accurately with their relative contribution to and mitigation of atmospheric greenhouse gas accumulation; [EPA-HQ-OAR-2010-0799-10337-A2, pp. 2-3]

Organization: Securing America's Future Energy (SAFE)

Use of Miles Per Gallon as Appropriate Metric: To calculate fuel economy across vehicles that rely on an increasingly diverse portfolio of fuels, NHTSA relies on an alternative fuel vehicle's "miles per gallon equivalent" (MPGe) as a representation of its fuel economy. Doing so, however, measures the performance of alternative fuel vehicles in a manner that is not particularly meaningful (miles per 115,000 BTU of energy) and is inconsistent with the original intent of the CAFE program. But virtually no one understands the meaning of miles per BTU of energy, and even if they did it is not particularly meaningful. Most importantly, however, it fails to account for the very real value that most alternative fuels provide to the nation by reducing our use of oil, helping to delink our economy from the global market, and reducing the economic and national security consequence of that dependence. [EPA-HQ-OAR-2010-0799-9518-A1, p. 16]

The MPG metric was really developed to serve as a surrogate for operating costs. That made sense when we relied on a single fuel, whose price was volatile. It allowed owners to compare the relative efficiency of vehicles so that we could quickly compare their relative operating costs. The use of MPG also allowed us to report a common measure of efficiency that isolated the effects of fuel price volatility. [EPA-HQ-OAR-2010-0799-9518-A1, p. 16]

Calculating fuel economy on the basis of MPGe is perhaps simple but flawed. In essence, the calculation upon which NHTSA relies is intended to promote efficiency for efficiency's sake. SAFE believes, however, that NHTSA should consider whether it makes more sense for its calculation to seek to optimize the primary goal of fuel economy regulations, which is to reduce oil consumption, which is overconsumed because it is underpriced. [EPA-HQ-OAR-2010-0799-9518-A1, p. 16]

A revised method of calculating fuel economy is warranted because using oil to fuel vehicles is different than the consumption of other fuels; the unique manner in which oil dependence undermines our nation's energy, economic and national security is different than other fuels. Nearly every fuel used in the United States other than those derived from crude oil, including the fuels used to generate electricity, is produced in North America. Their production supports American jobs and does increase the trade deficit, and their prices are less volatile than the price of oil. It was, in fact, concern about our consumption of oil that led to the first fuel economy standards, which were required by the Energy Policy and Conservation Act of 1975. Moreover, even as the United States established national policies to reduce our consumption of oil, we also established national policies, and spent tens of billions of dollars to promote the production and use of other fuels because of their merits relative to oil. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 16-17]

While several commenters at the public hearings concerning this regulation stated their desire for “technology neutral” regulations, SAFE believes that different treatment is justified for alternative fuels because their use does not have the same economic or security consequences as using oil. In fact, given the importance, and statutory goal, of reducing petroleum consumption, SAFE believes that vehicles that do not consume oil should be treated as such in the development of these regulatory programs. Such calculations are not possible when fuel economy is calculated on the basis of miles per gallon which is calculated as miles traveled divided by gallons of fuel consumed, because they do not consume any gallons of fuel and the denominator in the MPG calculation cannot be zero. They are, however, possible when fuel consumption is calculated on the basis of gallons per mile (or per 100 miles) which is calculated as gallons consumed divided by miles travelled, because the numerator in the equation can be zero. [EPA-HQ-OAR-2010-0799-9518-A1, p. 17]

As demonstrated in Table 2,[39] calculating the fleet average fuel consumption while treating alternative fuel vehicles as requiring no oil is a simple calculation that accurately reflects their contribution to our national goal of reducing oil consumption. Column 2 represents a vehicle’s fuel economy measure in miles per gallon, which is calculated by dividing miles travelled per gallons of gasoline consumed. Column 3 represents the gallons of fuel consumed by the vehicle per 100 miles travelled, which is calculated by dividing 100 by a vehicle’s MPGe. Column 4 reflects the numbers in column 3 taking into account that that vehicles 8 and 9 were natural gas vehicle and electric vehicles that consumed no oil and vehicle 10 was a PHEV that consumed less oil than reflected in its MPGe rating. [Table 2 can be found on p. 18 of Docket number EPA-HQ-OAR-2010-0799-9518-A1] [EPA-HQ-OAR-2010-0799-9518-A1, p. 17]

SAFE believes that calculating fuel economy as demonstrated in this table is more consistent with the original intent of the statute, in that properly emphasizes the goal of reducing petroleum consumption, and acknowledges that certain vehicles consume less or no petroleum products. SAFE recognizes that the current calculation, which is based in a vehicle’s MPGe, may be required by statute at this point in time. SAFE nevertheless encourages NHTSA to evaluate calculating fuel economy based on a gallons-per-mile metric, bring this issue to Congress’ attention at some point in the near future, and recommend that Congress amend the statute as appropriate. This is the first period of time over which NHTSA is likely to be regulating large the fuel economy of substantial numbers of electric drive vehicles. It is important to get the regulatory approach right at the earliest possible time. [EPA-HQ-OAR-2010-0799-9518-A1, p. 18]

39 The calculation of fuel consumption for a PHEV assumed calculation over a 100 mile trip without charging, a combined MPGe of 73, an MPGe in charge depleting mode of 93 MPGe, an MPG of 37 in charge sustaining mode, and a utility factor of 0.65.

Response:

Rejecting use of the 0.15 factor for GHG emissions compliance for all fuels

Many comments recommended that EPA use the 0.15 divisor, which has long been used for CAFE credits for alternative fuel vehicles, as an incentive for GHG emissions compliance for a variety of alternative fuels. Boyden Gray and Associates went so far as to argue that EPA is legally compelled to do so because the divisor is included in the 2007 EISA legislation, issued after the Supreme Court's decision in Massachusetts v. EPA. The argument goes that EISA and the CAA are in conflict on this point, and since EISA is the later-enacted statute, it must take precedence over both the CAA and the Supreme Court's opinion. EPA does not accept this argument. There is no suggestion in either the EISA text establishing the divisor (or elsewhere in EISA), or in the legislative history, of any Congressional intent to de facto amend the emission-standard setting provisions of the Clean Air Act, or to restrict the scope of the Supreme Court's holding that greenhouse gases are pollutants under the Clean Air Act (and therefore potentially subject to all Clean Air Act provisions for "pollutants"). Nor are the statutes in such dramatic conflict as the commenter would have it. The statutory divisor disappears for dual fuel CNG (and other alternative fuel) vehicles after MY 2019, and the statutory divisor is of little practical benefit to any CNG vehicles before then. This is because of a different limitation in EISA on the upper limit on credit use under CAFE, and because all available credits are being utilized by FFVs. See, e.g., comments of Encana and NGV America (alluding to this practical limitation). Moreover, the EPCA/EISA statutory criteria for eligibility for dual fuel CNG incentives are more restrictive than under the GHG rule. Under EPCA, dual-fuel CNG vehicles are required to have a CNG-only range of at least 200 miles to qualify for the CAFE credit - a requirement equivalent to a 95.4% natural gas usage rate according to the utility factor methodology. As commenter VNG pointed out, this effectively results in vehicles expected to fuel on natural gas a large majority of the time being treated as dedicated gasoline vehicles. Thus, had EPA adhered to strict harmonization with EPCA/EISA, the GHG rule would be more restrictive with respect to the use of utility factors for dual fuel CNG vehicles.

EPA thus does not accept that it is legally compelled to offer the 0.15 divisor as an incentive under the GHG rules. EPA also rejects this approach for policy reasons. Congress provided the 0.15 divisor for CAFE compliance because a vehicle that operates on a non-petroleum fuel consumes zero or near-zero petroleum, and petroleum conservation is a primary objective of the CAFE program. But the tailpipe GHG emissions from most alternative fuel vehicles are not zero or near-zero, and in any case EPA believes that GHG emissions compliance should simply be based on GHG emissions performance. The primary focus of the GHG standards must be GHG emissions performance. Cf. Massachusetts v. EPA, 549 U.S. at 528 ("But that DOT sets mileage standards in no way licenses EPA to shirk its environmental responsibilities. EPA has been charged with protecting the public's 'health' and 'welfare' [citing CAA section 202 (a)], a statutory obligation wholly independent of DOT's mandate to promote energy efficiency.") Adopting the 0.15 factor for GHG emissions compliance for vehicles with substantial tailpipe GHG emissions could yield a significant reduction of GHG programmatic benefits that is not warranted by these vehicles. We also disagree with those commenters who argued that EPA must adopt the 0.15 factor in order to not "negate the Congressional mandate" for CAFE credits. The Congressional mandate still applies for CAFE purposes. EPA's GHG program and NHTSA's CAFE program are harmonized in numerous ways, but there are a number of instances where the programs diverge with respect to incentives and flexibilities. See Preamble Section I.B.4. Here, EPA believes that the paramount emission reduction goals of the CAA warrant the difference in approach.

Adopting use of the 0.15 factor for CAFE compliance beginning in MY 2020

With one exception, commenters supported the proposal to continue to use the 0.15 divisor for CAFE compliance beginning in MY 2020. Nissan summarized the most common argument for retaining the 0.15 divisor for CAFE compliance, stating that the 0.15 divisor "is consistent with the purpose of the CAFE program—to reduce our country's dependence on foreign oil." The Alliance of Automobile Manufacturers argued that "this approach will maintain consistency between dedicated and dual fuel vehicle calculations and will continue to encourage manufacturers to build vehicles capable of operating on fuels other than petroleum." There was also support for retaining the 0.15 divisor for the CAFE program from other automakers, natural gas advocacy groups, and ethanol/renewable fuel groups. The one comment against retaining the 0.15 divisor was the American Petroleum Institute. It argued: "Section 32906 of the Energy Independence and Security Act of 2007 phased-out the maximum fuel economy credit attributable to dual fuel vehicles (except electric vehicles) that could be taken by manufacturers of those vehicles such that the credit was reduced from 1.2 mpg in model year 2014 (and previous model years) to 0.2 mpg in model year 2019 to '0 miles per gallon for model years after 2019.' Clearly, the EPA and NHTSA proposed treatment of model year 2020 and later dual fueled natural gas vehicles is overly generous and inconsistent with the intent and will of Congress. It should be set aside."

EPA, pursuant to its EPCA authority, is finalizing the CAFE compliance treatment for MY 2020 and later, as proposed, with one change being the addition of eligibility requirements for dual fuel CNG vehicles to be able to use the utility factor approach, as discussed in RTC Section 6.2. EPA is adopting the same approaches for weighting the fuel economy compliance values for dual fuel vehicles for CAFE compliance as we have done for GHG emissions compliance: using utility factors for PHEVs and dual fuel CNG vehicles (the latter must meet the eligibility requirements), and providing manufacturers the option of using projected national average E85 usage data, manufacturer-specific E85 usage data, or a 100% gasoline default value for ethanol FFVs. EPA is adopting the 0.15 divisor, and petroleum equivalency factor for PHEVs, for dual fuel vehicle CAFE compliance in MY 2020 and later, for two reasons. One, this approach is directionally consistent with the overall petroleum reduction goals of EPCA/EISA and the CAFE program, because it reflects the much lower or zero petroleum content of alternative fuels and continues to encourage manufacturers to build vehicles capable of operating on fuels other than petroleum. Two, the 0.15 divisor and petroleum equivalency factor (PEF) are used under EPCA to calculate CAFE compliance values for dedicated alternative fuel vehicles, and retaining this approach for dual fuel vehicles maintains consistency, for MY 2020 and later, between the approaches for dedicated alternative fuel vehicles and for the alternative fuel portion of dual fuel vehicle operation.

In response to the comment from the American Petroleum Institute, EPA recognizes that use of the 0.15 divisor, and petroleum equivalency factor for PHEVs, will continue to provide a large increase in CAFE compliance values for the vehicles previously covered by the special calculation procedures in 49 U.S.C. 32905, and that Congress chose both to end the specific calculation procedures in that section and over time to reduce the benefit for CAFE purposes of the increase in fuel economy mandated by those special calculation procedures. However, the MY 2020 and later methodology differs significantly in important ways from the special calculation provisions mandated by EPCA. Most importantly, the MY 2020 and later methodology reflects actual usage rates of the alternative fuel and does not use the artificial 50/50 weighting previously mandated by 49 U.S.C. 32905. In practice this means the primary vehicles to benefit from the MY 2020 and later methodology will be PHEVs and dual-fuel CNG vehicles, and not ethanol FFVs, while the primary source of benefit to manufacturers under the statutory provisions came from ethanol FFVs. Changing the weighting to better reflect real world usage is a major change from that mandated by 49 U.S.C. 32905, and it orients the calculation procedure more to the real world impact on petroleum usage, consistent with the statute's overarching purpose of petroleum conservation. In addition, as noted above, Congress maintained the 0.15 divisor in the calculation procedures for dedicated alternative fuel vehicles that result in increased fuel economy values. Finalizing the 0.15 divisor for dual fuel vehicles is consistent with this, as it uses the same approach for calculating fuel economy on the alternative fuel when there is real world usage of the alternative fuel. Since the MY 2020 and later methodology is quite different in effect from the specified provisions in 49 U.S.C. 32905, and is consistent with the calculation procedures for dedicated vehicles that use the same alternative fuel, EPA believes this methodology is an appropriate exercise of discretion under the general authority provided in 49 U.S.C. 32904.

Equivalent treatment of all alternative fuels under CAFE beginning in MY 2020

Bosch and the Motor and Equipment Manufacturers Association commented that all types of alternative fuels, including biodiesel, should be treated "equivalently" under the CAFE program. EPA agrees with these comments, and all dedicated alternative fuel vehicles will use the 0.15 divisor in CAFE calculations for MY 2020 and later. In addition, vehicles capable of operating on diesel containing at least 85% biodiesel (B85), will also use the 0.15 divisor in CAFE calculations for MY2020 and later. While B85 may not be considered an alternative fuel under EPCA at this time, 20% biodiesel (B20) is recognized by Congress for purposes of section 32905, and B85 exhibits the same or better petroleum replacement benefits as the 85% alcohol blend alternative fuels currently used in FFVs. Several commenters recommended that utility factors be used for CAFE calculations prior to 2020. EPA is rejecting this recommendation, as EPCA requires the Agency to assume 50% use of the conventional fuel and 50% use of the alternative fuel for CAFE calculations through MY 2019. Finally, VNG.Co suggested that the agencies consider possible ways to provide CAFE credits, in the pre-2020 timeframe, for duel fuel CNG vehicles that have a CNG range of less than 200 miles. EPA is rejecting this recommendation as well, as the 200-mile minimum range requirement is required under 49 U.S.C. 32901(c).

Finally, Plant Oil Powered Diesel Fuel Systems argued that EPA should re-evaluate the weight given to various alternative technologies and fuels according to a life-cycle approach, and to decouple fuel efficiency policy from GHG emissions policy. In setting these emissions standards, EPA reasonably chose to consider the impact on GHG emissions of the fuels used by the different types of vehicles by measuring the tailpipe emissions of vehicles, including alternative fuel vehicles (which normally emit less GHG emissions than gasoline or diesel-powered vehicles). POP Diesel's statement that the rules arbitrarily assign zero emissions and zero fuel consumption to electric vehicles is also misplaced. Electric vehicles have zero GHG emissions measured at the tailpipe. POP Diesel states further that the standards are arbitrary in the GHG-reducing weight given to some alternative technologies and fuels. POP Diesel's complaint that the rule provides incentives for use of certain advanced technologies such as hybrid electrification and hydrogen fuel cells questions legitimate policy choices unrelated to the issue of fuel use. See also responses in RTC Section 4 above.

In the separate, congressionally mandated, Renewable Fuel Standard program, there are strong incentives for use of renewable diesel fuels (the commenter's specific interest). This program is specifically designed to mandate increasing volumes of renewable fuel use in transportation fuels. The definition of renewable fuel includes thresholds for reductions in lifecycle greenhouse gas emissions, compared to petroleum fuel. For example, specified volumes of biomass-based diesel fuel must be used in the diesel transportation sector, and biomass-based diesel is defined in part as a diesel fuel that achieves a 50% reduction in life-cycle greenhouse emissions compared to baseline petroleum diesel fuel.

7. Off-Cycle Technology Credits

7.1. General Comments

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Honda Motor Co., Inc.
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
Borg Warner, Inc.
Center for Biological Diversity
Chrysler Group LLC
Delphi Corporation
EcoMotors International, Inc.
Fisker Automotive, Inc.
Ford Motor Company
General Motors Company
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Johnson Controls, Inc.
Mazda North American Operations
Mercedes-Benz USA, LLC
Motor & Equipment Manufacturers Association (MEMA)
National Wildlife Federation (NWF)
Natural Resources Defense Council (NRDC)
Porsche Cars North America, Inc. (PCNA)
United Automobile Workers (UAW)
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

The Alliance Supports the Credits for Off-Cycle GHG Emission Reductions And Fuel Economy Improvements. [EPA-HQ-OAR-2010-0799-9487-A1, p.10]

The overall GHG emission reductions proposed in the NPRM are a formidable challenge that requires new, creative approaches to emission reduction and energy efficiency. Continuing the off-cycle credit program provides an incentive to manufacturers to introduce new technologies that produce concrete environmental and fuel consumption benefits, provides flexibility toward meeting the increasingly stringent standards and encourages investment in technologies that will pay off over the longer term. [EPA-HQ-OAR-2010-0799-9487-A1, p.10]

The program flexibilities in the NPRM will help manufacturers introduce new technologies that produce concrete environmental and fuel consumption benefits. [EPA-HQ-OAR-2010-0799-9487-A1, p.10]

The proposed rules properly include various provisions offering manufacturers some flexibility in developing their plans to comply with the CAFE and GHG standards. Some of these provisions enable manufacturers to earn credits that can be used to satisfy part of their compliance obligations. While some may think the term 'credits,' as used here, connotes reduced stringency or even 'loopholes,' that is not the case. The objective of the CAFE and GHG standards is to reduce actual fuel consumption and actual GHG emissions from vehicles driven on American roads. In some cases, however, the laboratory testing used by the agencies to measure fuel economy and GHG emissions may not fully reflect the improvements built into a vehicle by the manufacturer, due to limitations of laboratory-based tests. And improvements to reduce MAC system refrigerant loss can reduce GHG emissions from vehicles while having little or no impact on fuel economy. It is important for the rules to properly account for such factors. Otherwise, manufacturers would be encouraged to focus solely on the test procedures, and opportunities for real-world GHG reduction and fuel economy improvement would be lost. The Alliance believes that the various credit provisions proposed by EPA and NHTSA are essential elements of the rulemaking package. Below we offer our specific comments on the details of these provisions. [EPA-HQ-OAR-2010-0799-9487-A1, p.10] [[This comment can also be found in Outline Heading 3.]]

Substantial GHG improvements should be achievable in off-cycle conditions using new technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

While there are substantial emission reductions that can be achieved through off-cycle technologies, it will be essential that the off-cycle program function effectively if the overall emission reduction goals are to be achieved. [EPA-HQ-OAR-2010-0799-9487-A1, p.26]

Organization: American Honda Motor Co., Inc.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 121.]

The addition of a thoughtful and reasonable approach to off-cycle credits is exciting to us and we believe will result in the introduction of many new and innovative technologies.

Organization: Association of Global Automakers, Inc. (Global Automakers)

The off-cycle credits provide incentives for manufacturers to pursue technologies that produce benefits in actual on-road driving but are not measured using the Federal Test Procedure (FTP). [EPA-HQ-OAR-2010-0799-9466-A1, p. 1]

Global Automakers supports the availability of credits for technologies that provide on-road efficiency and emissions benefits but whose benefits are not fully measured using the current city-highway test. [EPA-HQ-OAR-2010-0799-9466-A1, p. 5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 66.]

Off-cycle credits provide incentives for manufacturers to pursue technologies that produce benefits in actual on-road driving but are not measured using the FTP.

Organization: BMW of North America, LLC

BMW supports both approaches - predefined list and individual OEM applications; furthermore, we welcome the proposed extension of the scope for off-cycle technologies. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 1]

Organization: Borg Warner, Inc.

BorgWarner supports the inclusion of “off-cycle credits” that attempt to give manufacturers the proper motivation for implementing technologies that achieve real world results that are not seen on the official rating test cycles. While we support this type of thinking, a more robust solution would be to employ updated testing methods that more accurately measure real world results seen by the consumer. [EPA-HQ-OAR-2010-0799-9320-A1, p. 2]

Organization: Center for Biological Diversity

3. Off-cycle credits in general

The concept of allowing credit for the installation of new and energy efficient technology that is early in the compliance cycle, or that cannot be measured by existing testing mechanisms, is sound, as long as the duration of the credit period is brief and provides no disincentive to the implementation of other available features. However, all such credits must be carefully vetted to ensure that there is no double counting. Any technologies already required to be implemented cannot also generate credits, and there must be verified data showing that actual efficiency gains equal to the credits are being achieved. [EPA-HQ-OAR-2010-0799-9479-A1, p. 22]

We disagree with the Agencies’ suggestion that even more off-cycle credits should be allowed, without any rulemaking, if some unspecified data supports them. That the Agencies perceive a need for this request simply points out the fact that technological innovation will race far ahead of the weak standards the Agencies are here proposing, and that the Agencies are aware of this fact. Instead, the Agencies must design much stronger standards, rather than requesting the right to “catch up” with clearly foreseeable improvements without the requisite notice and comment rulemaking process. [EPA-HQ-OAR-2010-0799-9479-A1, p. 22]

Organization: Chrysler Group LLC

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 54.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 61.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 26.]

Secondly, Chrysler supports the additional detail proposed for catching off-cycle fuel economy and greenhouse gas improvements. The agency's built on this facet of the 2012 through '16 model year regulation that recognizes improvements in fuel economy and greenhouse gases that are not captured in laboratory tests but do have real-world reductions.

Organization: Delphi Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 108.]

We support the existing credit options

In addition, existing credit options and additional flexibility for off-cycle credits provide an incentive for the industry to look across the entire automobile for solutions. [This comment can also be found in section 7 of this comment summary.]

We applaud the agencies' efforts to extend additional flexibility for off-cycle credits.

In addition, existing credit options and additional flexibility for off-cycle credits provide an incentive for the industry to look across the entire automobile for solutions. [This comment can also be found in section 10.1 of this comment summary.]

Organization: EcoMotors International, Inc.

Several significant changes are being proposed to the off-cycle credits program, including some modifications to the existing MYs 2012-2016 program. These changes include establishment of a list of pre-approved off-cycle technologies with pre-defined CO_2 credits, commencing in MY2017; removing the requirement that off-cycle technologies must be 'new, innovative, and not widespread', and that the benefits of these technologies must not be 'significantly measurable over the 2-cycle test'; clarifying several requirements of the current two-tiered process for demonstrating the CO_2 reductions of off-cycle technologies and instituting this testing methodology for MYs 2012-2016 credits as well; establishing a four-step process for reviewing and providing a decisions on credits; and starting with MY2017, allowing manufacturers to generate 'fuel consumption improvement values' equivalent to CO_2 off-cycle credits for use in the CAFE program. [EPA-HQ-OAR-2010-0799-9594-A2, pp. 12-13]

The concept of providing credits as a way to further incentivize technology development in key areas is a good one. EcoMotors generally supports the changes made to the off-cycle credit program to provide manufacturers with more certainty with regard to credit application and testing. [EPA-HQ-OAR-2010-0799-9594-A2, p. 13]

- Specific Recommendation: EcoMotors generally supports continuation of the off-cycle credit program with the changes proposed to the current program, as well as the enhancements proposed for the future. [EPA-HQ-OAR-2010-0799-9594-A2, p. 13]

Organization: Fisker Automotive, Inc.

- Encourage application of the pre-approved list for earlier model years [EPA-HQ-OAR-2010-0799-9266-A1, p. 5]

Organization: Ford Motor Company

Ford strongly supports many of the updates that the agencies have proposed to the off-cycle technology program, as detailed in the comments provided by the Alliance. [EPA-HQ-OAR-2010-0799-9463-A1, p. 15]

Organization: General Motors Company

GM supports the proposal for an updated off-cycle technology framework. Significant detailed technical information on off-cycle technologies and the off-cycle framework is contained in the Alliance comments. GM recommends that the off-cycle program be fully examined in the mid-term review, and updated as appropriate. [EPA-HQ-OAR-2010-0799-9465-A1, p. 3]

Organization: Hyundai America Technical Center

Hyundai supports the proposed improvements in accounting for technologies whose benefits are not realized on the city and highway cycles. Hyundai believes off-cycle technology is an area that is ripe for innovation and can provide important gains in real world fuel economy. However, we do have several suggestions for improvements to the off-cycle credit processes. [EPA-HQ-OAR-2010-0799-9547-A1, pp.4-5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 172.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 22.]

We support the credit and banking provisions and continued application of off-cycle credits for technology whose benefits cannot be accounted for on the city and highway test cycles.

Hyundai believes that off-cycle technology is an area that is ripe for innovation, and can provide important gains in real world fuel economy and greenhouse gas reductions.

Organization: International Council on Clean Transportation (ICCT)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 197.]

ICCT supports the concept of off-cycle credits. However, we will provide detailed written suggestions on how to better implement them so that they are valid and avoid double counting.

Organization: Johnson Controls, Inc.

Rewarding various innovative off-cycle technologies encourages rapid adoption and increases deployment into the fleet. [NHTSA-2010-0131-0253-A1, p. 4]

Organization: Mazda North American Operations

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 63-64.]

Mazda fully supports the proposed extension of the availability of off-cycle credits for model years 2017 to 2025. We agree that continuing the off-cycle credit program provides an incentive to manufacturers to introduce new technologies that produce concrete environmental and fuel consumption benefits, provides flexibility toward meeting the increasingly stringent standards, and encourages investment into technologies that will have a payoff over the longer term.

Organization: Mercedes-Benz USA, LLC

DAG supports the effort to include off-cycle credits that reduce CO_2 in ways not measured by the fuel economy test cycles. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-2]

Organization: Motor & Equipment Manufacturers Association (MEMA)

Taken as a whole, MEMA supports the proposal to provide off-cycle credits for any technologies that demonstrate significant, incremental off-cycle CO_2 reductions and the corresponding fuel consumption improvement values. [EPA-HQ-OAR-2010-0799-9478-A1, p.7]

Organization: National Wildlife Federation (NWF)

In principle, we also support incentives for plug-in hybrid electric and electric vehicle technology and for real off-cycle CO_2 reductions, and we look forward to continuing to work with automakers, the agencies and consumers to maximize the effectiveness of these credits and other measures which enable rapid adoption of new technology, and to optimize short and long term emissions impacts. [EPA-HQ-OAR-2010-0799-9887-A2, p. 4] [[This comment can also be found in Outline Headings 4. and 5.]]

Organization: Natural Resources Defense Council (NRDC)

5. Off-cycle credits: Off-Cycle Technology Credits Should Only Be Awarded for Real and Verifiable GHG Reductions

While NRDC appreciates EPA's efforts to evaluate GHG reduction technologies that are not identified under current compliance tests and to encourage continued innovation in this area, EPA should only provide credits if such technologies can be verified as providing real and enforceable GHG reductions. As GHG reductions are indentified and evaluated, EPA should consider the widespread adoption of these technologies when setting the stringency of future standards. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

Organization: Porsche Cars North America, Inc. (PCNA)

Porsche strongly supports provisions for off-cycle credits, which encourage creative approaches to emission reduction and energy efficiency, provide compliance flexibility amid increasingly stringent standards, and encourage investment in technologies for long term benefit. [EPA-HQ-OAR-2010-0799-9264-A1, p. 5]

Organization: United Automobile Workers (UAW)

Off-cycle credits also recognize real-world emission reductions that are not accounted for in the current official test procedures to measure vehicle emissions. [EPA-HQ-OAR-2010-0799-9563-A2, p.3]

Organization: Volkswagen Group of America

Volkswagen contributed to and supports the comments submitted by the Alliance of Automobile Manufacturers (Alliance) regarding off-cycle technology credits. Volkswagen continues to make significant investments in deploying an array of innovative, fuel saving off-cycle technologies for our consumers. [EPA-HQ-OAR-2010-0799-9569-A1, p. 32]

Organization: Volvo Car Corporation (VCC)

Off-cycle credits are a good opportunity for manufacturers to get credits for technology that does not appear on the normal cycle but favors the overall fuel economy. [EPA-HQ-OAR-2010-0799-9551-A2, p. 6]

Response:

EPA received widespread support for continuing the off-cycle credits program beyond MY 2016. Several manufacturers noted that the program provides additional flexibility and encourages the development of technologies that provide real world emissions reductions not captured on the 2-cycle test procedure. EPA concurs with these comments and is extending the off-cycle credit program to MY 2017 and later. The National Wildlife Federation and Natural Resources Defense Council (NRDC) also supported the off-cycle credits program in principle as long as credits can be verified as providing real and enforceable GHG reductions. Center for Biological Diversity also raised the issue that EPA must ensure that there is no double counting of credits. As discussed in Section III.C.5.b., EPA believes that the program has been designed to ensure credits are real and verifiable and to prevent double counting. Several commenters provided comments on the various aspects of the proposed design of the off-cycle credits program. These comments are summarized and addressed in this section below.

NRDC commented that as GHG reductions are indentified and evaluated, EPA should consider the widespread adoption of these technologies when setting the stringency of future standards. In response, EPA plans to closely monitor the use of the off-cycle credits program and expects that it will be one of the factors considered in the mid-term evaluation. In addition, EPA notes that the 2017-2025 model year standard stringencies in fact reflect the use of direct and indirect air conditioning improvements, as well as the two cycle benefits of stop start and active aero dynamic technologies.

ICCT comments in public hearing testimony that they support the concept of off-cycle credits and will provide detailed written suggestions on how to better implement them so that they are valid and avoid double counting. As discussed in RTC section 7.2 below, ICCT provided detailed written comments regarding the proposed off-cycle credit technology list and the issue of double counting.

7.2. Pre-Approved Technology List

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Chemistry Council (ACC)
Association of Global Automakers, Inc. (Global Automakers)
Bayer MaterialScience
Bosch
California Air Resources Board (CARB)
California Manufacturers & Technology Association (CMTA)
California State Sheriffs' Association (CSSA), California Police Chiefs Association (CPCA), California Narcotic Officers' Association (CNOA)
Chrysler Group LLC
Crime Victims United of California (CVUC)
CTIA - The Wireless Association
Denso International America, Inc.
EcoMotors International, Inc.
Enhanced Protective Glass Automotive Association (EPGAA)
Ford Motor Company
Garmin International Inc.
Guardian Automotive Products, Inc.
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Mercedes-Benz USA, LLC
Motor & Equipment Manufacturers Association (MEMA)
Natural Resources Defense Council (NRDC)
Pittsburgh Glass Works (PGW)

Porsche Cars North America, Inc. (PCNA)
SABIC Innovative Plastics US LLC
Society of the Plastics Industry, Inc. (SPI)
TechAmerica
Toyota Motor North America
United Automobile Workers (UAW)
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: International Council on Clean Transportation (ICCT)

16) Off-Cycle Credits

ICCT general comment on off-cycle credits and testing

ICCT strongly supports credits for off-cycle reductions in concept. Such credits can reduce the cost to manufacturers for compliance in the short run and can create cost-effective pathways for greater fuel consumption and GHG emission reductions in the long run. [EPA-HQ-OAR-2010-0799-9512-A1, p. 36]

However, it is extremely important that the credits properly reflect actual in-use reductions, do not duplicate on-cycle benefits, and can be validated. Credits that are artificial and do not directly result in comparable in-use reductions can severely undermine the effectiveness and credibility of the standards. [EPA-HQ-OAR-2010-0799-9512-A1, p. 36]

The same principle applies to default off-cycle credits. In theory they are a good idea that can create incentives for manufacturers to invest in off-cycle technologies, but if not assessed properly they create windfall credits that reduce fuel consumption and GHG emissions benefits of the program. [EPA-HQ-OAR-2010-0799-9512-A1, p. 36]

The ICCT recommends that EPA establish procedures to quantify and validate off-cycle benefits before granting a specific default off-cycle credit value. Absent a solid case for default off-cycle credit values, traditional case-by-case testing is needed to properly access off-cycle credits. Any default credits should be based on: [EPA-HQ-OAR-2010-0799-9512-A1, pp. 36-37]

1. Robust data showing real and quantifiable reductions that are not double counted on the regulatory test cycles, and [EPA-HQ-OAR-2010-0799-9512-A1, p. 37]

2. Effective performance benchmarks and verification that ensure vehicles receiving these credits will achieve the potential emission reductions in the real world. [EPA-HQ-OAR-2010-0799-9512-A1, p. 37]

The off-cycle approval procedures adopted by EPA for the 2012-2016 final rule provide accurate and appropriate guidelines for approval of off-cycle credits. These procedures should be followed both for granting specific approvals to manufacturers for off-cycle credits and for establishing default off-cycle credit values. [EPA-HQ-OAR-2010-0799-9512-A1, p. 37]

Given the importance of maintaining the benefits of this rulemaking and the ability to make additions to the default lists later as additional data is generated, technologies that do not clearly meet these requirements should be dropped from the default list during this rulemaking. [EPA-HQ-OAR-2010-0799-9512-A1, p. 37]

Solar Reflective Paint and Window Glazings

We agree with the criteria used for this category of off-cycle credits. US EPA has determined that it will achieve real reductions that are not counted in the regulatory test cycle through detailed technical studies including the CARB regulatory development process (these off-cycle credits are in lieu of CARB regulation). Specific benchmarks in the draft TSD are based on well-established principles of solar gain and OEMs must meet performance criteria to verify the emission reductions. Thus, these credits meet the general principle of being verifiable and additive off-cycle benefits. [EPA-HQ-OAR-2010-0799-9512-A1, p. 38]

As noted earlier, the off-cycle credits for solar reflective paint and window glazings must be combined with other load reductions and A/C system efficiency in a multiplicative manner in cases where an OEM wishes to claim both types of credits. [EPA-HQ-OAR-2010-0799-9512-A1, p. 39]

Active or Passive Ventilation

Vehicle active or passive ventilation may have the technical potential to reduce air conditioning load, but they do not meet the general criteria discussed above for default credits. The NREL report on these technologies was developed based on limited data and states that further evaluation is needed.[67] The NREL report also notes that floor-level ventilation could allow dust, animals, and/or exhaust to enter the vehicles.[68] Thus drivers (or dealers) may be motivated to close them off. Similarly, the driver's response to ventilated seats is unclear at this time. [EPA-HQ-OAR-2010-0799-9512-A1, p. 39]

These ventilation technologies could also compete with glazings and paints, which have been more thoroughly evaluated, for solar load reduction credits. Default credits for active or passive ventilation should be deferred. They can be reconsidered later if there is further study to verify real-world performance and if a performance benchmark for verification is developed. [EPA-HQ-OAR-2010-0799-9512-A1, p. 39]

Should credits be granted, the method of combining AC system efficiency and any such credits in cases where an OEM wishes to claim both types of credits must be used, as noted above. [EPA-HQ-OAR-2010-0799-9512-A1, p. 39]

General Credit Calculation for Reducing or Offsetting Vehicle Load

The draft TSD bases the 'off-cycle' benefits of reducing engine load by 100 W on the simulated values provided in table 5-18 of the draft TSD. The benefits calculated on FTP/HWY cycle are appropriate. However, the calculations of the 5-cycle benefits of a 100 w load reduction were inappropriately applied, as they used a g/mile offset instead of a percentage offset. [EPA-HQ-OAR-2010-0799-9512-A1, p. 42]

Table 10 compares the benefits of a 100 w load reduction on the FTP/HWY to the benefits on the 5-cycle. For each vehicle, the benefits on the 5-cycle are less then than the 2-cycle testing benefits in terms of percentage CO_2 reduction. While the g/mi reductions for 5-cycle testing is greater in terms of g/mi that on the 2-cycle testing, this is only because the baseline CO_2 is much higher on the 5-cycle. The benefits of reducing or offsetting vehicle load on the 5-cycle are actually proportionally less than they are on the FTP/HWY. It is not appropriate to apply 5-cycle gCO_2/mi reductions to FTP/HWY baseline gCO_2/mi values. This is mixing apples and oranges. [Table 10 can be found on p. 43 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, pp. 42-43]

The last row in the table illustrates that using the 5-cycle g/mi instead of the percent benefit produces a percentage benefit that is larger than the benefit on either the FTP/HWY or the U506. This is artificial and unwarranted. The FTP/HWY percentage benefits must be used for any electrical load reduction that does not occur on the test cycles (for instance headlights) and no additional credits should be given for any electrical load reduction that occurs on the test cycle (for instance thermoelectric generation). [EPA-HQ-OAR-2010-0799-9512-A1, p. 43]

LED Lighting

We agree that this technology has the potential to reduce emissions that are not captured on FTP/highway testing cycles. However, as discussed above, the off-cycle credits must be based upon the FTP/HWY percent and g/mile reductions and not on the 5-cycle g/mile reductions. As a result the credit value should be 0.8 grams per mile rather than 1.1 g/mile, or 0.9 g/mile with headlights, based on actual load reduction scaled to the potential benefits that US EPA modeled for FTP/highway testing cycle as shown in Table 11 and Table 12. [Tables 11 and 12 can be found on p. 44 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 43]

Thermoelectric and Solar Electrical Generation

Thermoelectric and solar electrical generation could reduce vehicle consumption of energy generated by the engine by recharging the battery pack in hybrids or electric vehicles. However, the premise that engine load reduction is undercounted on the FTP/HWY is incorrect, as noted above. [EPA-HQ-OAR-2010-0799-9512-A1, p. 44]

In addition, the benefits of these technologies would be difficult to quantify and verify. An NREL study indicates that potential thermoelectric output changes dramatically based on temperature conditions.76 A rating based on theoretical peak output may not reflect real world conditions with rapidly varying engine loads, competition for exhaust heat, high thermal stress, etc. Similarly, the tailpipe benefits of vehicle rooftop solar electrical generation are highly variable. A plug-in Prius may see little solar availability during early and late commute hours, and displace grid electricity if parked at a vehicle charger during the day while a delivery vehicle in use all day may get more benefits. Solar availability also varies hourly, seasonally and geographically. [EPA-HQ-OAR-2010-0799-9512-A1, p. 45]

Appropriate in-use data would be necessary to quantify and verify any proposed off-cycle credit. Further any credit, including default credit, granted should be based on the FTP/HWY results in Table 5-18, as discussed above. [EPA-HQ-OAR-2010-0799-9512-A1, p. 45]

Engine Heat Recovery

The off-cycle benefits for engine heat recovery are entirely based upon the erroneous assumption that there are larger benefits off-cycle than on cycle for electricity generation or load reduction, as discussed above. The benefits of electricity generation are larger on-cycle than on the 5-cycle test. Thus, the proposed default off-cycle credits for engine heat recovery are not appropriate. [EPA-HQ-OAR-2010-0799-9512-A1, p. 45]

There is some reason to believe that high vehicle loads will cause engine heat recovery systems to operate more efficiently. However, there are at least three different ways to recover exhaust heat as electricity; Rankine cycle devices, turbo-compounding, and thermo-electric generators. Each operates very differently and has a different profile of energy captured. Thus, credits could be appropriate, but only if a performance benchmark for verification is developed and valid data is generated. [EPA-HQ-OAR-2010-0799-9512-A1, p. 45]

Active Transmission Warm-Up and Active Engine Warm-Up

The proposed off-cycle credits for active transmission and engine warm-up are highly questionable. The primary problem is that EPA assumed no benefit from an active transmissions/engine warm-up during the FTP. [EPA-HQ-OAR-2010-0799-9512-A1, p. 45]

However, normal engine operating temperatures are about 180°F. This is about 105°F above the FTP test temperature and about 160°F above the 20°F test temperature. Thus, the benefit of active engine warm-up on the FTP should be about two-thirds of the benefit at 20°F and the proportional benefit will be even closer. [EPA-HQ-OAR-2010-0799-9512-A1, p. 45]

The statement about transmission warm-up is similarly incorrect:

'In cold temperatures, the exhaust heat warms the transmission fluid much more quickly than if the vehicle relies on passive heating alone.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 45]

In reality, the exhaust heat will warm the transmission fluid much more quickly than if the vehicle relies on passive heating alone at all ambient temperatures. Thus, most of the benefit of the warm-up systems will occur on-cycle during 2-cycle testing. [EPA-HQ-OAR-2010-0799-9512-A1, p. 46]

Another concern is the statement about the benefits of active warm-up:

'The Ricardo data indicates that there is a potential to improve GHG emissions by 7% at 20°F if the vehicle is fully warm.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 46]

The ICCT has thoroughly read the Ricardo report and all references to the Ricardo report in the draft TSD. There is no reference of any kind to any modeling, detailed or otherwise, on active transmission warm-up or accelerating powertrain warm-up from 20°F. More importantly, no data is presented by the agencies to show what the improvement in GHG emissions would be at 75°F if the vehicle is fully warm, as would also occur with active warm-up. Only if the percentage improvement in GHG emissions at 20°F is larger than the percentage improvement at 75°F would off-cycle credits be warranted - and even in this case the benefit would only be the difference in the percentage improvement, averaged over the annual temperature distribution. [EPA-HQ-OAR-2010-0799-9512-A1, p. 46]

Performance benchmarks need to be established and valid data generated before granting credits for active engine and transmission warmup. As a minimum, the effect of active warmup needs to be evaluated at both 20°F and at 75°F on the 2-cycle and the 5-cycle procedures, and evaluations at intermediate temperatures would be helpful. Most vehicles are equipped with engine temperature sensors, and usually also transmission temperature sensors, which could be helpful in evaluating the length of the warm-up time, but efficiency data associated with warm-up time and ambient temperatures is also needed. [EPA-HQ-OAR-2010-0799-9512-A1, p. 46]

The ICCT agrees that there may be some incremental off-cycle benefits from active warmup systems, but most of the benefit will occur on cycle and it is important to properly evaluate the incremental benefits before granting default credits. [EPA-HQ-OAR-2010-0799-9512-A1, p. 46]

Active Aerodynamics

Active aerodynamic devices may have real benefits beyond what is measured on the regulatory test cycles, but such devices would also improve efficiency on the 2-cycle tests. Thus, additional verification is needed to determine whether active aerodynamics would show incremental improvement. Benchmarks would also be necessary to quantify any benefits for active aerodynamics above and beyond the test cycle. [EPA-HQ-OAR-2010-0799-9512-A1, p. 46]

Coast-down testing for regulatory compliance could either understate or overstate the benefits of active aerodynamics. Grill shutters could activate at higher speeds than tested, while on the other hand the technology may be more active during the test cycle than when encountering real world conditions, such as AC load and deactivation when there is a risk of freezing. 77 In addition, quantification and verification would be necessary for any technologies that are not 'active' or fully 'active' on the test cycle. For instance, the draft TSD notes that the potential benefits range from 0-5%. Thus, we strongly encourage US EPA to develop performance criteria before granting any off-cycle credits for active aerodynamics. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 46-47]

Start-Stop Technology

We agree with US EPA and NHTSA's principle that technologies inherent to the vehicle (mass, tire rolling resistance, etc) are not appropriate for off-cycle credits. This principle also applies to start stop technology. [EPA-HQ-OAR-2010-0799-9512-A1, p. 47]

The draft TSD states that real world vehicle stop times and start-stop emission benefits are higher than reflected on the regulatory test cycle. However, this is based upon two erroneous assumptions. [EPA-HQ-OAR-2010-0799-9512-A1, p. 47]

First, the idle rate during the FTP is listed at 16% in Table 5-23 of the draft TSD. This is incorrect. Prior EPA documentation lists a 19% idle rate79 and a simple accounting of the LA finds a 19.1% idle rate (1372 total seconds with 262 seconds at zero speed). A smaller error is that the highway cycle was considered to have zero idle, while a simple accounting shows a 0.5% idle rate (764 total seconds with 4 seconds at zero speed). Weighted 55% for the FTP and 45% for the highway cycle, this yields an idle rate of 10.7%, not the 9% listed in the table. [EPA-HQ-OAR-2010-0799-9512-A1, p. 47]

Second, and more important, the draft TSD improperly accounts for the reduction in idle off operation at cold temperatures. The TSD assumes that the engine will continue to run 25% of the time to provide cabin heating at cold ambient temperatures (vehicles that reduce this percentage can apply for a separate credit). If the engine is also needed to power the air conditioner during start stop then further adjustment will be needed. However, the draft TSD first calculates the idle-off benefits assuming 100% idle-off time, then applies the 25% reduction only to the calculated benefit. This is not appropriate. The proper accounting should reflect the fact that the total idle-off time has been reduced by 25% and should apply the 25% reduction to the total in-use idle-off time. The total in-use idle-off time is estimated to be 13.5%, so the actual amount of idle-off time in-use is 10.1% (13.5% times 75%). [EPA-HQ-OAR-2010-0799-9512-A1, p. 47]

To the extent that air conditioning use further causes the engine to stay on at idle, in-use idle time will be even lower. Accounting for both heating and air conditioning use, the in use idle-off time could be as low as 6%. (This is assuming that the idle-off time from MOVES is accurate. No documentation of the source of the 13.5% estimate is presented.) [EPA-HQ-OAR-2010-0799-9512-A1, p. 47]

The amount of idle-off time in-use is significantly less that the idle-off time on the FTP-HWY cycles. Thus, the FTP-HWY overstates the benefit of idle-off and no off-cycle credit is warranted for idle-off systems. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 47-48]

Electric Heater Circulation Pumps

We agree that electric heater circulation pumps have the potential for increment benefits for start-stop and that further evaluation will help better quantify those benefits. As the base engine-off time was not calculated properly, the assessment of the benefit of electric heater circulation pumps needs to be redone as well with the proper assumptions about engine-off time. [EPA-HQ-OAR-2010-0799-9512-A1, p. 48]

In addition, it is reasonable to reflect the entire idle period when calculating the engine-off time on the FTP test cycle, since cabin heating is not active and not captured during FTP under any circumstances (which is different than start-stop as noted in our comments on start-stop). However, a downward adjustment is needed at colder ambient temperatures to account for some idle conditions where the engine may be operated, such as for warm-up purposes and for defroster use. Also, the amount of water pump electrical consumption needs to be accounted for in calculating the emissions benefit of this technology. [EPA-HQ-OAR-2010-0799-9512-A1, p. 48]

Finally, off-cycle credits should be granted only if the total amount of engine-off time is less than occurs on the 2-cycle tests and only for the amount of this reduction. [EPA-HQ-OAR-2010-0799-9512-A1, p. 48]

Performance criteria need to be developed and valid data generated to quantify the potential incremental improvement, including consideration of total engine-off time versus that on the 2-cycle test, before granting off-cycle credits for electric heater water circulation pumps. [EPA-HQ-OAR-2010-0799-9512-A1, p. 48]

---

67 J Rugh and R Farrington, Vehicle Ancillary Load Reduction Project Close-out Report, January 2008 p51

68 Ibid p15

76 J Rugh and R Farrington, Vehicle Ancillary Load Reduction Project Close-out Report, January 2008 p11.

79 see Table 6-9 of Federal Test Procedure Review Project: Preliminary Technical Report May 1993 EPA 420R- 93-007

Response:

We appreciate the extensive comments from the International Council on Clean Transportation (ICCT) and the effort that went into generating them. We agree with ICCT that the off-cycle credit program will “reduce the cost to manufacturers for compliance in the short run and can create cost-effective pathways for greater fuel consumption and GHG emission reductions in the long run.” In addition, we agree that it is “extremely important that the credits properly reflect actual in-use reductions, do not duplicate on-cycle benefits, and can be validated.” Lastly, we agree with ICCT “that EPA establish procedures to quantify and validate off-cycle benefits” and that any off-cycle credits should be based on “robust data showing real and quantifiable reductions that are not double counted on the regulatory test cycles” and “Effective performance benchmarks and verification that ensure vehicles receiving these credits will achieve the potential emission reductions in the real world.” We believe the off-cycle credit program provisions we are finalizing today achieve this.

Accordingly, we carefully considered the comments from ICCT on the off-cycle credit program and technologies on the off-cycle technology menu. This consideration and our responses are reflected throughout the Off-Cycle Program discussion in Section 5.2 of TSD Chapter 5 for this final rule. In some cases, we felt that ICCT's comments had merit and either revised the underlying credit analysis and credit value (e.g., engine idle start-stop) or are finalizing the credit values as proposed (e.g., solar reflective paint, glazing) after considering and responding to the comment in that part of the Joint TSD. In other cases (e.g., active aerodynamics, waste heat recovery (formerly engine heat recovery), active and passive cabin ventilation, vehicle load reduction offset estimate, electric heater circulation pump, active transmission and engine warm-up, high efficiency exterior lights, solar and thermal electrical generation), we disagreed with the comments from ICCT. Further, the supplemental comments from the Alliance addressed ICCT's concerns and (as explained specifically in the technology-by-technology discussion in section 5.2 of the Joint TSD) presented data that supported the proposed credit values and represented "robust data showing real and quantifiable reductions."

Therefore, we are finalizing the off-cycle credit program and the off-cycle technology menu as discussed on 5.2 of TSD Chapter 5 and Preamble II.F.2. addressing many of the concerns expressed by ICCT.

Organization: Alliance of Automobile Manufacturers

The off-cycle technology credit menu is a necessary addition to the off-cycle program to avoid administrative delays and burdensome credit application requirements. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

The procedures for earning off-cycle credits need to be kept simple. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

The pre-defined list will incentivize automakers to apply technologies earlier than they might have otherwise. It also offers manufacturers certainty about how much credit they will earn if they choose to apply one or more of the technologies on the list. The Alliance welcomes the agencies' willingness to add further technologies to the list as additional information becomes available. [EPA-HQ-OAR-2010-0799-9487-A1, p.26]

The proposed off-cycle credit menu is therefore a great addition to the GHG reduction and corporate fuel economy programs, as the experience thus far with separately testing and applying for off-cycle credits on each model has shown that the administrative obstacles inherent in this approach prohibit an effective program. [EPA-HQ-OAR-2010-0799-9487-A1, p.26]

The Alliance supports establishment of credits for all of the proposed technologies, but, in a few cases, recommends revisions to the proposed credit amounts. [EPA-HQ-OAR-2010-0799-9487-A1, p.26]

High Efficiency Exterior Lighting [EPA-HQ-OAR-2010-0799-9487-A1, p.26]

The Alliance supports this proposed off-cycle credit, but with modifications. EPA's calculation of the feasibility of a 60 watt total reduction threshold to qualify for this credit contains flaws in the calculation. Because of these flaws, achieving a full 60 watt improvement from the lights impacted by the credit may not be realistic. [EPA-HQ-OAR-2010-0799-9487-A1, p.26]

The 60 watt calculation included benefits from high efficiency low beam and high beam headlights, even though these lights are not covered by the credit provision. Due to their high wattage, the net benefits from these two high efficiency sets of lights are approximately 9 watts of the estimated 60 watt improvement. Creating such an unrealistically high improvement threshold for this technology could render the credit provision ineffective. In order to make the incentive to implement this technology more functional, this improvement threshold should be reduced to no more than 50 watts for the listed package of exterior lights, assuming no other changes are made to this provision. The credit amount for this package of lights would need to be adjusted accordingly. Also, Center High-Mount Stop Lamps (CHMSL) and brake lights impact the two-cycle fuel economy test, and high efficiency CHMSL and brake lights should not be a requirement to qualify for this off-cycle credit. [EPA-HQ-OAR-2010-0799-9487-A1, p.26]

In support of our above analysis, we recommend that the definition of "high efficiency exterior lighting" be updated to: [EPA-HQ-OAR-2010-0799-9487-A1, p.26]

High efficiency exterior lighting means a lighting technology that, when installed on the vehicle, is expected to reduce the total electrical demand of the exterior lighting system when compared to conventional lighting systems. LED lights specifically qualify. Separate credit values may be earned for high efficiency lighting installed in the following components: parking/position, tail lights, license plate lights, low beam lights and daytime running lights. Credits may also be earned for a high efficiency lighting bundle that is installed in the following components: front and rear side markers, and backup/reverse lights. [EPA-HQ-OAR-2010-0799-9487-A1, pp.26-27]

Additional changes to this credit provision are also attractive. Roll-out implementation may be speeded if portions of the credit were available for separate, individual lights, rather than requiring that all exterior lights feature high efficiency before a credit can be gained. This would allow each light to be swapped at the earliest possible time, in order to gain credits as quickly as possible. The most attractive candidates for individual credits are the largest three savings opportunities on the EPA/NHTSA list: parking/position lights, tail lights and license plate lights. Scaling the 1.1 gCO_2/mile credit proposed in the NPRM to the proportional benefits of these individual lights would indicate that individual credits are warranted of 0.2 gCO_2/mile for substitution of each of these lights individually (i.e., 0.2 gCO_2/mile for the parking/position lights, 0.2 gCO_2/mile for the tail lights and 0.2 gCO_2/mile for the license plate lights). The remaining 0.5 gCO_2/mile could then be earned by applying the package of all the remaining listed smaller lights in the NPRM. [EPA-HQ-OAR-2010-0799-9487-A1, pp.26-27]

Because of their low usage and corresponding low energy consumption, we do not feel that it is warranted to include the requirement for more costly high efficiency turn signals in this package in order to qualify for the high efficiency lighting off-cycle credit. [EPA-HQ-OAR-2010-0799-9487-A1, p.27]

Our experience indicates that an off-cycle credit for low beam lights would also be beneficial. The source used by EPA showed potential LED low beam benefits of only a few watts, whereas automakers' recent development experience has identified potential low beam savings opportunities of at least 60 watts. Based on EPA's usage calculations, a low beam savings of 60 watts should justify an off-cycle credit of 1.1 gCO_2/mile. We therefore recommend that a 1.1 gCO_2/mile off-cycle credit be offered on the menu for low beam lights that achieve power levels consistent with a savings of 60 watts below the baseline halogen technology. [EPA-HQ-OAR-2010-0799-9487-A1, p.27]

Beneficial emission reductions can also be achieved if a credit is offered for high efficiency Daytime Running Lights (DRLs). Based on the calculation below, we estimate a credit of 0.6 gCO_2/mile is justified for application of LED DRLs. Although DRLs are not mandatory, the reality is that they are often implemented as standard equipment by many manufacturers to improve highway safety. Due to their safety impact, they are a socially beneficial technology that has been encouraged by public policies at both EPA and NHTSA. Given that they are widely used, and that more efficient LED DRLs are often prohibitively expensive, it makes sense to offer an off-cycle credit as an incentive for LED DRLs. More widespread use of LED DRLs will result in real-world energy savings and GHG reductions. Because they are illuminated such a large portion of the time, they are the single most important exterior light to target for an off-cycle credit. [EPA-HQ-OAR-2010-0799-9487-A1, p.27]

Engine Heat Recovery

The Alliance supports EPA's analysis for this credit. This technology is not yet available for commercial implementation. Offering a credit is appropriate and could play an important role in bringing this technology into commercial use. However, we believe that the credit amounts should be determined by a scalable application of the metric that EPA proposed, rather than a step-wise function that awards credits only in increments of 100 watt capacities. Further we believe that it is appropriate to award credits for recovered heat that is converted to either electrical or mechanical energy to meet vehicle requirements. To simplify implementation and fairly reward each application, the credit should be made a linear function, based on the wattage generated. [EPA-HQ-OAR-2010-0799-9487-A1, p.29]

We recommend that the definition be updated to: [EPA-HQ-OAR-2010-0799-9487-A1, p.29]

Engine heat recovery means a system that captures heat that would otherwise be lost through the exhaust system or through the radiator and converting that heat to electrical or mechanical energy to meet the requirements of the vehicle. Systems obtain credits according to the following formula: [EPA-HQ-OAR-2010-0799-9487-A1, p.29]

Credit (gCO_2/mile) = (System watt Capacity / 100) * 0.7 [EPA-HQ-OAR-2010-0799-9487-A1, p.29]

Solar Panels

The Alliance supports EPA's analysis for this credit. Based on rough theoretical calculations and experimental data, offering a credit as proposed for each 50 watt unit of electricity generation is appropriate. Because there is a wide range of potential sizes for these panels, this credit should be scalable to reward panels that are smaller or larger than 50W. Also, the credit should not be confined to panels installed on the roof, since they may be installed elsewhere on the vehicle. This credit should be available for all vehicles, not only for electric-propulsion vehicles, since all vehicles can benefit from the additional battery charging to power accessories, even where it is not used for propulsion. [EPA-HQ-OAR-2010-0799-9487-A1, p.29]

Therefore, we suggest the following update to the proposed technology name and definition: [EPA-HQ-OAR-2010-0799-9487-A1, p.29]

Solar Panels means the installation of solar panels on a vehicle to capture and provide energy to the vehicle (e.g., provide energy to an electric drive system via battery charging or provide power to an electric motor or 12V battery trickle charging or cabin ventilation, etc.). Credit levels are granted according to the following formula: [EPA-HQ-OAR-2010-0799-9487-A1, p.29]

Credit (gCO_2/mile) = (Equivalent watt Output / 50) * 3.0 [EPA-HQ-OAR-2010-0799-9487-A1, p.29]

Active Aerodynamic Improvements

The Alliance supports EPA's analysis for this credit. Active aerodynamic technologies hold great promise and are already entering commercial usage. Offering sizable off-cycle credits will be very helpful to stimulate faster adoption. The tables on p. 5-64 of the Draft Joint Technical Support Document (TSD) show the relationship between aerodynamic improvement and credit amounts. The credits offered by EPA in the credit menu should be scalable, based on the lines in this table, rather than simply using one point on the table. Application of multiple active aerodynamic technologies can result in a Cd improvement of over 3%, whereas the proposed credit amounts are based on a 3% improvement. Therefore, to maintain an incentive to maximize the use of these technologies (e.g., active grille shutters plus active air dams), higher credit amounts should be allowed on the menu for aerodynamic improvements above 3%. EPA acknowledges in the TSD that larger aerodynamic improvements are possible, but suggests using model-by-model testing and applications to EPA for situations where greater credit is sought for these larger aerodynamic improvements. Case-by-case testing and applications are overly burdensome, and it would be much simpler to amend the credit menu to use the tables below, from p. 5-64 of the TSD, to award appropriate credit for higher levels of aerodynamic improvement. [EPA-HQ-OAR-2010-0799-9487-A1, p.30] [For table referenced, please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.30]

In practice, drivers often operate vehicles at sustained, steady-state, high speeds. This condition is barely represented in the drive cycles and weighting system used in the 5-cycle fuel economy calculations. For a Cd improvement of 3%, this actually warrants a credit in excess of the proposed 0.6 gCO_2/mile for cars and 1.0 gCO_2/mile for trucks. Therefore, EPA should consider the lines on p. 5-64 of the TSD as minimum possible credit amounts for these technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.31]

We recommend the definition be updated as follows: [EPA-HQ-OAR-2010-0799-9487-A1, p.31]

Active aerodynamic improvements means technologies that are actively controlled to improve aerodynamic efficiency. Credits are awarded according to the following formulas: [EPA-HQ-OAR-2010-0799-9487-A1, p.31]

Car: Credit (gCO_2/mile) = (Percent Reduction in Aero Drag, Cd) * 0.2 [EPA-HQ-OAR-2010-0799-9487-A1, p.31]

Truck: Credit (gCO_2/mile) = (Percent Reduction in Aero Drag, Cd) * 0.33 [EPA-HQ-OAR-2010-0799-9487-A1, p.31]

Engine Stop-Start

The Alliance supports the creation of a substantial off-cycle credit for this important technology. The proposed potential credit of 2.9 gCO_2/mile for cars and 4.5 gCO_2/mile for trucks, as proposed in the NPRM, is a major concern. We believe a credit of 5.5 gCO_2/mile is warranted; credits for this technology below 2.9/4.5 gCO_2/mile could substantially undermine the ability of the industry to achieve the overall GHG targets. [EPA-HQ-OAR-2010-0799-9487-A1, p.31]
Occupant Thermal Comfort Technologies (e.g., Electric Heater Circulation Pump) [EPA-HQ-OAR-2010-0799-9487-A1, p.32]

In 2011, based on actual vehicle tests and 5-cycle calculations, EPA awarded General Motors (GM) credits of 1.8 gCO_2/mile for GM's 2009-2012 full-size truck hybrids and 1.5 gCO_2/mile for its 2012 Buick Lacrosse© and Regal© hybrids. These vehicles use the auxiliary coolant pump to keep the stop/start feature working in cold weather, while continuing to provide heat to the passenger cabin. In contrast, the proposed credits for this technology are only 1.0 gCO_2/mile for cars and 1.5 gCO_2/mile for trucks. [EPA-HQ-OAR-2010-0799-9487-A1, p.32] Using the 5-cycle methodology, the technology simply provides continued operation of the stop/start feature during the idle portions of the cold weather test, and the amount of fuel savings should be fairly consistent between applications. The differential between the proposed credit and the actual test results is sufficiently large that automobile manufacturers may independently file separate credit applications for the larger credit amount justified by actual vehicle testing of each application using the 5-cycle provisions of the regulation. This would be a large and unnecessary testing and administrative burden for the automobile manufacturers as well as the regulatory agencies. We recommend that EPA avoid this unattractive situation by making the menu credit for this technology more consistent with actual test values. A menu credit of at least 1.5 gCO_2/mile for cars and 1.8 gCO_2/mile for trucks is justified. [EPA-HQ-OAR-2010-0799-9487-A1, p.32]

We recommend that the definition be modified slightly to: [EPA-HQ-OAR-2010-0799-9487-A1, p.31]

Engine stop-start means a technology which enables a vehicle to automatically turn off the engine when the vehicle comes to rest and to restart the engine with driver action (e.g., applying pressure to the accelerator or releasing the brake). Off-cycle engine stop-start credits will only be allowed if the Administrator has made a determination under the testing and calculation provisions in 40 C.F.R. part 600 that engine stop-start is the predominant operating mode. [EPA-HQ-OAR-2010-0799-9487-A1, p.31]

Various studies and agency literature suggest longer periods are spent at idle than would be indicated by the FTP cycle, and support a high off-cycle credit for the stop-start technology. [EPA-HQ-OAR-2010-0799-9487-A1, p.31]

To encourage additional technologies that provide similar benefits, the Alliance also recommends that the proposed definition be broadened to include other methods of maintaining occupant thermal comfort during off-engine periods. Specifically, we propose the following technology name and definition updates: [EPA-HQ-OAR-2010-0799-9487-A1, p.32]

Occupant thermal comfort technologies means technologies or strategies that maintain occupant thermal comfort during off-engine periods in a stop-start equipped vehicle or in a hybrid electric vehicle or plug-in hybrid electric vehicle (e.g., PTC heater or electric heater circulation pump). [EPA-HQ-OAR-2010-0799-9487-A1, p.32]

Active Drivetrain Warm-Up (e.g., Active Transmission Warm-Up)

The Alliance supports EPA’s analysis for the active transmission warm-up off-cycle credit of at least 1.8 gCO_2/mi. EPA’s proposed definitions for credits for these technologies should, however, be broadened to allow the inclusion other methods of driveline fluid warm-up as well as other sources of waste heat (perhaps using different credit amounts for other variations of this technology). For example, credits should explicitly be allowed for systems that use a coolant loop to transfer the heat from the exhaust system to the transmission and/or engine, since this may be more practical than directly heating engine oil or transmission oil in a heat exchanger in the exhaust system. Also, the performance of the system is not significantly changed by the use or non-use of coolant in the heat exchange process. [EPA-HQ-OAR-2010-0799-9487-A1, p.32]

Provisions should also be made to provide similar credits for other technologies that hasten transmission warm-up and viscosity management (perhaps without using exhaust gases). Some of these technologies are discussed in the next section of our comments, including quantification of potential credit amounts. [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

In addition, we recommend the following updates to the proposed technology name and definition: [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

Active drivetrain warm-up means a system that uses waste heat or waste energy to warm-up driveline fluids quickly and reduces parasitic drivetrain (transmission, axles, PTUs, t-cases) system losses related to friction and fluid viscosity. In this category, active transmission warm-up would receive credit of at least 1.8gCO_2/mi. [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

As mentioned in on p. 5-68 of the TSD, it is not necessary to heat the differential in rear-wheel-drive vehicles in order to qualify for this credit. However, we believe that heating the rear differential in these vehicles for viscosity management might provide an attractive additional credit opportunity, and urge EPA to re-examine this possibility. [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

Active Engine Warm-Up

Our research supports the 1.8 gCO_2/mile off-cycle credit proposed by EPA for this technology. However, EPA's definitions for earning this credit should be broadened such that a coolant loop may be used to transfer the heat. Provisions should be made to provide similar credits for any other technologies that hasten engine warm-up to provide similar benefits. [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

We recommend the following updates to the proposed definition: [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

Active engine warm-up means a system that uses waste heat, thermal storage, or waste energy to warm up targeted sub-systems of the engine such that frictional losses are reduced. It would allow a faster transition from colder operation to warm operation, decreasing CO_2 emissions and increasing fuel economy. In this category, active engine warm-up would receive credit of at least 1.8 gCO_2/mi. [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

Thermal Control [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

Substantial benefits are available from thermal management technologies, and we support establishing off-cycle credits for these technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

Glazing [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

The Alliance supports including glazing as an available off-cycle credit. However, the most effective of these technologies (solar reflective) have relatively high cost, weight and functional impact hurdles that must be overcome to integrate these technologies into the vehicle. For simplicity and clarity, the Alliance recommends that EPA state that the glazing area to be used in the calculation is the total glazing surface area. Also, credit should be granted for all vehicles that utilize glazing better than 62% Tts (except roof lights), regardless of whether the improved glass is marketed as the standard glazing or an optional upgrade. [EPA-HQ-OAR-2010-0799-9487-A1, p.33]

In addition, we ask that EPA and NHTSA consider the input of suppliers of alternative glazing technologies on amendments or additions to the proposed rule. Consideration of a broader range of technologies will provide the necessary flexibility to achieve the desirable air conditioning-related emission reductions, for example, based on reduced glazing thermal conductivity. [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

Active Seat Ventilation [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

The Alliance supports EPA's analysis for this credit. As a practical matter, only the front seats need to be ventilated to qualify for this credit, and this should be stated in the final regulation. The analysis EPA uses to quantify the credit is based on two ventilated front seats. Rear seats are used much less than front seats, and the cost attractiveness of this credit opportunity would fall dramatically if it were required that more than the front seats be ventilated. Also, EPA's definitions should specify that this credit can be earned for systems that either pull air into the seat or push air out. The impacts on occupant comfort and energy consumption are the same, and both approaches are used. This could be accomplished by making the following minor modifications to the proposed definition: [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

Active seat ventilation means a device which draws (or pushes) air or transfers heat/energy from the seating surface which is in contact with the occupant and exhausts (or pushes) it to a location away from the seat. [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

Solar Reflective Paint [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

The Alliance supports this credit while noting that, as with glazings, the analysis of energy benefits may be optimistic because of the "worst case" test conditions used in the studies by the National Renewable Energy Laboratory. [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

The draft EPA definitions for both active and passive ventilation satisfy that objective, since the definitions allow for many ventilation techniques. [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

Active Cabin Ventilation

Cabin ventilation can be attractive for reducing air conditioner energy consumption and improving comfort upon vehicle entry. Research on ventilation technologies has confirmed that interior breath level temperatures can be reduced to the levels that EPA used in its analyses for both active and passive ventilation. [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

There are many approaches that can be used, such as ventilating through slightly open windows or sunroofs, existing air conditioner ducts, or new air flow passages with dedicated fans. The ventilation may also be continuous or pulsed. Since such a wide range of approaches can be applied, the definitions used for this technology should not be overly prescriptive. [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

Also, we have found that it is very difficult to physically measure air flow through the vehicle to a tight margin, so it is not practical to set air flow thresholds in order to qualify for these ventilation credits. [EPA-HQ-OAR-2010-0799-9487-A1, p.34]

The cost of these technologies can be high. For example, active ventilation fans may need to be coupled to a photovoltaic panel which powers the fans, so that the system does not drain the battery if the vehicle is parked for long periods. The system used in EPA's analysis featured a unique sunroof with several small fans to pull hot air out of the cabin. Because are all very costly items, the credit offered for these technologies needs to be ample in order to make the business case for their implementation attractive. [EPA-HQ-OAR-2010-0799-9487-A1, p.35]

The Alliance therefore supports the definition of “active cabin ventilation” as proposed. [EPA-HQ-OAR-2010-0799-9487-A1, p.35]

Passive Cabin Ventilation

As previously stated in the discussion of active ventilation, cabin ventilation can be attractive for reducing air conditioner energy consumption. Research on ventilation technologies has confirmed that interior breath level temperatures can be reduced to the levels that EPA used in its analyses for passive ventilation. All of our other comments relative to active ventilation also apply to passive ventilation. For example, the system analyzed by EPA employed automatic sunroof features together with eight new floor vents in the vehicle. These are significant hardware changes to the vehicle which would require a significant credit in order to make an adequate business case for implementation. [EPA-HQ-OAR-2010-0799-9487-A1, p.35]

We propose to broaden the definition of Passive Cabin Ventilation slightly as follows: [EPA-HQ-OAR-2010-0799-9487-A1, p.35]

Passive cabin ventilation means ducts, devices or methods that utilize convective airflow to move heated air from the cabin interior to the exterior of the vehicle. [EPA-HQ-OAR-2010-0799-9487-A1, p.35]

High Efficiency Alternator [EPA-HQ-OAR-2010-0799-9487-A1, p.35]

This was a good recommendation on EPA’s initial off-cycle technology list, as contained in the EPA/NHTSA July 2011 Supplemental Notice of Intent. However, this technology subsequently did not appear in the proposed credit menu contained in the NPRM. We recommend that it be added back to the menu. [EPA-HQ-OAR-2010-0799-9487-A1, p.35]

The standard 2-cycle fuel economy test is performed with accessories “off,” and even the 5-cycle tests only activate some accessories, such as the air conditioner on the SCO3 test. In contrast, real-world driving has higher average electrical loads from a variety of accessories such as radios, lights, rear-seat entertainment systems, wipers, power window motors, etc. Conservatively, we estimate that at least a 20 amp average electric load differential exists in actual real-world driving over the typical 20 amp load during the 2-cycle test. High efficiency alternators provide fuel consumption benefits for this extra 20 amp real-world-driving differential which are not captured on the 2-cycle test, and so these benefits should be eligible for an off-cycle credit. [EPA-HQ-OAR-2010-0799-9487-A1, pp.35-36]

A traditional baseline alternator might have had an efficiency rating under the Verband der Automobilindustrie (VDA, the trade association represent German automobile manufacturers) test procedure of 60% to 64%, with high efficiency models having ratings above 68% VDA. To translate these differences into a GHG-equivalent, GM ran simulations of three different alternators on a range of four different vehicles using the NEDC drive cycle. The alternators were the Valeo SG11 (61% VDA), Bosch E6 (69% VDA) and Denso DSO (70% VDA). [EPA-HQ-OAR-2010-0799-9487-A1, p.36]

Each of these was simulated using the GM Unified Models for the Cadillac SRX, Chevrolet Sonic, Chevrolet Cruze, and the new GM Alpha platform. Actual performance curves for each of the alternators were used for one set of simulations. To simplify the comparisons, another set of simulations was done for the high efficiency Bosch and Denso alternators, wherein the actual performance curves were compared to alternator performance curves set to be exactly 10% lower than the actual curves. Also, a very simple set of simulations was done to compare a flat 70% efficiency alternator to a 60% efficiency alternator. [EPA-HQ-OAR-2010-0799-9487-A1, p.36]

The following chart shows the efficiency curves for the Bosch and Valeo alternators, and also shows the curve for the Bosch alternator modified to be exactly 10% below the actual Bosch data: [EPA-HQ-OAR-2010-0799-9487-A1, p.36] [For the chart please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.36]

Using this approach, the following CO_2 savings were estimated for the extra 20 amps typical of real word driving, compared to the 2-cycle test's 20 amp load: [EPA-HQ-OAR-2010-0799-9487-A1, p.37] [For the chart please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.37]

As would be expected, the complexity of vehicle operations results in a spread in results from this exercise. However, there are consistently CO_2 savings, with a representative savings appearing to be approximately 1.0 gCO_2/mile. We therefore recommend that an off-cycle credit of 1.0 gCO_2/mile be established for vehicles that use an alternator rated at 68% VDA or better. Alternator loads are rising as more electric features are used in vehicles; this credit amount is conservative in that it does not account for this trend of increasing vehicle-generated electricity usage. [EPA-HQ-OAR-2010-0799-9487-A1, p.38]

HVAC Eco-Mode

We appreciate the agencies' willingness to recognize the real-world fuel economy and GHG improvements from driver-selectable technologies. We understand that expected usage data will be required as a basis for adding these technologies to the menu. Since 2011, GM has featured an "eco button" on the Chevrolet Equinox® that allows drivers to select a driving mode which adjusts powertrain operation to achieve an improvement of approximately one mpg in combined city/highway driving. This has proven to be a popular feature with many customers, and GM has collected substantial data that documents high customer usage of this driving mode. In a two-week survey of 3,500 owners of the 2011 Equinox conducted through OnStar® technology, the following usage information was collected: [EPA-HQ-OAR-2010-0799-9487-A1, p.38]

50.3% of customers were using the eco mode for in excess of 90% of their driving, [EPA-HQ-OAR-2010-0799-9487-A1, p.38]

57.4% of customers were using the eco mode in excess of 50% of the time, and [EPA-HQ-OAR-2010-0799-9487-A1, p.38]

34% had never activated their eco mode. [EPA-HQ-OAR-2010-0799-9487-A1, p.38] While the fuel economy benefits of the powertrain eco settings appear in the city and highway fuel economy tests, the benefits of the new HVAC eco settings do not. These HVAC eco features should therefore be candidates for off-cycle GHG emissions credits. [EPA-HQ-OAR-2010-0799-9487-A1, p.38]

The driver selectable HVAC eco mode initiates alternative air conditioner settings, such as reduced blower speeds and evaporator core temperatures, both of which reduce load on the compressor. During cold weather, the blower speed is also reduced, which reduces blower energy consumption while also improving powertrain warm-up. Below are tables presenting test data from six SCO3 tests and two Cold CO tests on a 2013 Equinox. This data clearly shows the different, energy-saving operating characteristics from normal mode to eco mode. [EPA-HQ-OAR-2010-0799-9487-A1, p.38]

Based on GM 5-cycle testing on the 2013 Equinox, GM calculated that the HVAC energy savings for the eco button are 1.8 g CO_2/mile. Based on GM OnStar usage data, 50% usage is an appropriate adjustment for this credit, since at least 50% of the drivers are using it at least 90% of the time, with another 7% of drivers using it between 50% and 90% of the time, and 13% of drivers using it between 0% and 50% of the time. Multiplying 50% usage by GM's tested 5-cycle improvement of 1.8 gCO_2/mile yields a credit of 0.9 gCO_2/mile. The Alliance therefore recommends that a 0.9 gCO_2/mile credit for an HVAC eco button be established on the EPA menu. [EPA-HQ-OAR-2010-0799-9487-A1, pp.38-39] [For the figure please refer EPA-HQ-OAR-2010-0799-9487-A1, p.39]

Bypass Valve for Transmission Oil Cooler

This is an alternative approach to faster transmission warm-up and viscosity management, without using exhaust gases. Many vehicles, especially large trucks, feature transmission oil coolers that provide increased functionality to operate under heavy loads. One drawback, however, of the traditional transmission oil cooler is that it continuously cools the oil, even under circumstances when it would be advantageous for fuel economy to have the transmission oil gaining heat more rapidly. Adding a bypass valve for the transmission oil cooler allows the oil flow to be controlled to provide maximum fuel economy under a wide variety of operating conditions such as cold weather. However, bypass valves are not currently commonly used with transmission oil coolers. [EPA-HQ-OAR-2010-0799-9487-A1, p.39]

The Alliance recommends that an off-cycle credit of 0.3 gCO_2/mile be established for vehicles that have a transmission oil cooler with a bypass valve. This 0.3 gram proposed credit is proportional to the 1.8 gram benefit observed for active transmission warm-up using exhaust gases, based on the benefits observed during GM engineering development work with these technologies. Also, the bypass valve is additive, and even synergistic to the benefits of using exhaust gases for faster transmission warm-up, so both of these active transmission warm-up credits should be available on a vehicle. For example, a transmission with an oil cooler, combined with the bypass valve and exhaust gas-assisted warm-up, allows fine tuning of viscosity management, since accelerated heating or cooling of the oil can both be accomplished, depending on operating conditions. [EPA-HQ-OAR-2010-0799-9487-A1, p.39]

Electronic Thermostat and Electric Water Pump

This technology provides both faster engine warm-up and tighter continuous control of engine block temperature. The variable electric water pump only performs as much work as is demanded of it at any given time, based on instructions coming from the thermostat. This allows the water pump to work less immediately after startup, thereby warming the engine faster, since less heat is taken from the engine by its cooling system. This is especially valuable on the cold CO test cycle. The pump also works less under other operating conditions, thereby reducing the parasitic drag on the engine when compared to a conventional mechanical belt driven pump. This provides for tighter control of the engine temperature to its ideal (which optimizes fuel economy), with less energy spent on engine cooling. In an analysis using a conservative 3% on FTP City combined cycle, the improvement from a mechanically driven water pump and a conventional thermostat produces a 1 gram CO_2/ benefit using the 5-cycle calculation method. The vehicle used for this analysis was a 2.4L four cylinder SUV. [EPA-HQ-OAR-2010-0799-9487-A1, p.40]

As noted above, we also recommend the following updates to the off-cycle technology definitions: [EPA-HQ-OAR-2010-0799-9487-A1, p.41] [For the figures 'above' please refer to EPA-HQ-OAR-2010-0799-9487-A1, pp.40-41]

High efficiency exterior lighting means a lighting technology that, when installed on the vehicle, is expected to reduce the total electrical demand of the exterior lighting system when compared to conventional lighting systems. LED lights specifically qualify. Separate credit values may be earned for high efficiency lighting installed in the following components: parking/position, tail lights, license plate lights, low beam lights, and daytime running lights. Credits may also be earned for a high efficiency lighting bundle that is installed in the following components: front and rear side markers, and backup/reverse lights. [EPA-HQ-OAR-2010-0799-9487-A1, p.41]

Engine heat recovery means a system that captures heat that would otherwise be lost through the exhaust system or through the radiator and converting that heat to electrical or mechanical energy to meet the requirements of the vehicle. Systems obtain credits according to the following formula: [EPA-HQ-OAR-2010-0799-9487-A1, p.41]

Credit (gCO_2/mile) = (System watt Capacity / 100) * 0.7 [EPA-HQ-OAR-2010-0799-9487-A1, p.41]

Solar Panels means the installation of solar panels on a vehicle to capture and provide energy to the vehicle (e.g., provide energy to an electric drive system via battery charging or provide power to an electric motor or 12V battery trickle charging or cabin ventilation, etc.). Credit levels are granted according to the following formula: [EPA-HQ-OAR-2010-0799-9487-A1, p.41]

Credit (gCO_2/mile) = (Equivalent watt Output / 50) * 3.0 [EPA-HQ-OAR-2010-0799-9487-A1, p.41]

Active aerodynamic improvements means technologies that are actively controlled to improve aerodynamic efficiency. Credits are awarded according to the following formulas: [EPA-HQ-OAR-2010-0799-9487-A1, p.41]

Car: Credit (gCO_2/mile) = (Percent Reduction in Aero Drag, Cd) * 0.2 [EPA-HQ-OAR-2010-0799-9487-A1, p.41]

Truck: Credit (gCO_2/mile) = (Percent Reduction in Aero Drag, Cd) * 0.33 [EPA-HQ-OAR-2010-0799-9487-A1, p.41]

Engine stop-start means a technology which enables a vehicle to automatically turn off the engine when the vehicle comes to rest and restart the engine with driver action (e.g., applies pressure to the accelerator or releases the brake). Off-cycle engine stop-start credits will only be allowed if the Administrator has made a determination under the testing and calculation provisions in 40 C.F.R. part 600 that engine stop-start is the predominant operating mode. [EPA-HQ-OAR-2010-0799-9487-A1, p.42]

Occupant thermal comfort technologies means technologies or strategies that maintain occupant thermal comfort during off-engine periods in a stop-start equipped vehicle or in a hybrid electric vehicle or plug-in hybrid electric vehicle (e.g., PTC heater or electric heater circulation pump). [EPA-HQ-OAR-2010-0799-9487-A1, p.42]

Active drivetrain warm-up means a system that uses waste heat or waste energy to warm-up driveline fluids quickly and reduces parasitic drivetrain (transmission, axles, PTUs, t-cases) system losses, related to friction and fluid viscosity. In this category, active transmission warm-up would receive credit of at least 1.8 gCO_2/mi. [EPA-HQ-OAR-2010-0799-9487-A1, p.42]

Active engine warm-up means a system that uses waste heat, thermal storage, or waste energy to warm up targeted sub-systems of the engine such that frictional losses are reduced. It would allow a faster transition from colder operation to warm operation, decreasing CO_2 emissions, and increasing fuel economy. In this category, active engine warm-up would receive credit of at least 1.8 gCO_2/mi. [EPA-HQ-OAR-2010-0799-9487-A1, p.42]

Active seat ventilation means a device which draws (or pushes) air or transfers heat/energy from the seating surface which is in contact with the occupant and exhausts (or pushes) it to a location away from the seat. [EPA-HQ-OAR-2010-0799-9487-A1, p.42]

Passive cabin ventilation means ducts, devices or methods that utilize convective airflow to move heated air from the cabin interior to the exterior of the vehicle. [EPA-HQ-OAR-2010-0799-9487-A1, p.42]

Finally, opportunities exist to streamline traffic flow, reduce congestion and reduce emissions through better driving. For example, there are technologies that provide the driver or the vehicle with information for improved routing, or that provide the driver or the vehicle with information for more efficient vehicle operation. GPS technology can play a role in improving both driver behavior and vehicle operation. The opportunities for improvements through these eco driving technologies are not sufficiently defined for the Alliance to propose specific credit definitions and criteria at this time, but the industry hopes that it can work with the agencies in the future to create off-cycle credits for these technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.44]

The following supplemental comments address the comments of the International Council on Clean Transportation (ICCT). While ICCT purports to support the proposed rule, it advocates eliminating or rendering de minimis many of the proposed flexibility mechanisms. [EPA-HQ-OAR-2010-0799-11790-A1, p.2]

1. ICCT's Approach Would Delay Important Program Flexibilities Needed to Encourage Experimentation and Early Adoption of Innovative Technologies.

The mechanisms under attack by ICCT are a key feature of the proposed regulation, and have helped this rulemaking to proceed on an expedited timeline compared to similar major EPA and NHTSA rulemaking processes. Many of ICCT's comments call for further study before compliance credits are granted under the flexibility provisions. There will, in fact, be further study of the effectiveness of these technologies, but the timing for establishing the flexibility mechanisms cannot be separated from the expedited timing for the overall regulation. With this in mind, we encourage EPA to move forward with establishing a broad array of credit opportunities in the flexibility provisions of their regulation, to encourage early experimentation and early adoption of innovative new technologies. As the Agencies gain experience with the new approaches, they can refine the flexibility mechanisms appropriately. [EPA-HQ-OAR-2010-0799-11790-A1, p.2]

2. ICCT's Approach Would Make It Impossible for Automakers to Achieve the Level of Off-Cycle Credits that EPA Included in Setting the Stringency of the Overall GHG Regulations.

Although ICCT states that it "strongly supports" credits for off-cycle emission reductions (ICCT Comments, p. 1), the net effect of its specific recommendations would almost completely eliminate the off-cycle improvement program. [EPA-HQ-OAR-2010-0799-11790-A1,p.2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 98.]

Finally, manufacturers should be encouraged through flexibilities and incentives to implement verifiable innovations that enhance vehicle safety, that explore new technology applications and reduce CO_2 emissions.

The following supplemental comments address the comments of the International Council on Clean Transportation (ICCT). While ICCT purports to support the proposed rule, it advocates eliminating or rendering de minimis many of the proposed flexibility mechanisms. [EPA-HQ-OAR-2010-0799-11790-A1, p.2]

For most technologies in EPA's proposal, ICCT either entirely opposes credits (e.g., stop-start, active engine and transmission warm-up, ventilated seats and active and passive ventilation), or requests further study (e.g., engine heat recovery, solar panels, active aerodynamic improvements, and electric heater circulation pumps). Only three technologies would remain; for these, ICCT recommends reducing the credit amounts to levels well below the credit levels proposed in the NPRM. The remaining credits that ICCT recommends would be LED lights (at 0.8 gCO_2/mile) and solar reflective paint and glazing (jointly capped at 1.8 gCO_2/mile for cars and 2.6 gCO_2/mile for trucks, following a recommended 40% reduction for expected MAC efficiency improvements). Based on these ICCT recommendations, the maximum potential off-cycle credits for any car would be 2.6 gCO_2/mile and the maximum truck off-cycle credit would be 3.4 gCO_2/mile. [EPA-HQ-OAR-2010-0799-11790-A1, p.2]

In contrast, EPA included off-cycle credits for widespread implementation of start-stop and active aerodynamic technologies in setting the stringency of the overall GHG standards. The combined off-cycle credits for these two technologies are proposed to be 3.5 gCO_2/mile for cars and 5.5 gCO_2/mile for trucks (76 Fed. Reg. 74854, 75022 (Dec. 1, 2011)). Thus, if ICCT recommendations were fully implemented, it would be impossible to achieve the level of off-cycle credits that EPA included in setting the stringency of the overall greenhouse gas regulations. [EPA-HQ-OAR-2010-0799-11790-A1, p.3]

1. ICCT's Approach Would Delay Important Program Flexibilities Needed to Encourage Experimentation and Early Adoption of Innovative Technologies.

The mechanisms under attack by ICCT are a key feature of the proposed regulation, and have helped this rulemaking to proceed on an expedited timeline compared to similar major EPA and NHTSA rulemaking processes. Many of ICCT's comments call for further study before compliance credits are granted under the flexibility provisions. There will, in fact, be further study of the effectiveness of these technologies, but the timing for establishing the flexibility mechanisms cannot be separated from the expedited timing for the overall regulation. With this in mind, we encourage EPA to move forward with establishing a broad array of credit opportunities in the flexibility provisions of their regulation, to encourage early experimentation and early adoption of innovative new technologies. As the Agencies gain experience with the new approaches, they can refine the flexibility mechanisms appropriately. [EPA-HQ-OAR-2010-0799-11790-A1, p.2]

2. ICCT's Approach Would Make It Impossible for Automakers to Achieve the Level of Off-Cycle Credits that EPA Included in Setting the Stringency of the Overall GHG Regulations.

Although ICCT states that it "strongly supports" credits for off-cycle emission reductions (ICCT Comments, p. 1), the net effect of its specific recommendations would almost completely eliminate the off-cycle improvement program. [EPA-HQ-OAR-2010-0799-11790-A1,p.2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 98.]

Finally, manufacturers should be encouraged through flexibilities and incentives to implement verifiable innovations that enhance vehicle safety, that explore new technology applications and reduce CO_2 emissions.

3. Credit Calculation for Specific Off-Cycle Technologies

a. General Credit Calculation for Reducing Vehicle Load

EPA states a goal of matching off-cycle credits to real world emission reductions, and ICCT endorses the principle that “the credits properly reflect actual in-use reductions” (ICCT Comments, p. 36). However, ICCT then states that credits for reductions in electrical load should be based on the (lower) electrical loads on the two-cycle FTP/HWY tests, rather than the (higher) loads on the five-cycle tests. Yet it is the higher electrical loads on the five-cycle test that are more representative of “actual in-use reductions,” since some accessories such as the air conditioner are activated in the five-cycle tests, the fuel pump works harder at higher speeds, etc. In fact, since there are electrical features such as radios, phones, etc. not activated on the five-cycle procedures, the real world benefits are probably even higher. Despite ICCT’s comments to the contrary, there is no reason that grams per mile of CO_2 calculated using the five-cycle procedure, or any other more “real world” basis, cannot be subtracted from baseline emissions measured on the two-cycle tests. Doing so is consistent with the principle of providing off-cycle credits that reflect actual in-use reductions. [EPA-HQ-OAR-2010-0799-11790-A1, p.3]

b. High Efficiency Exterior Lighting

ICCT supports off-cycle credits for this technology, although it proposes changes in the calculation methodology to base it on the 2-cycle drive cycles, rather than 5-cycle calculations. As discussed above, this change would go against the goal of the program to grant credit based on real world emission reductions. The 5-cycle procedures are intended to be more representative of real world conditions. [EPA-HQ-OAR-2010-0799-11790-A1, p.3]

ICCT does not note the two most important changes that are needed to the exterior lighting credit, which are to offer credit for LED low beam and daytime running lights. These two sets of lights offer the greatest potential emissions reductions in the exterior lighting category. [EPA-HQ-OAR-2010-0799-11790-A1, p.3]

c. Electric Heater Circulation Pump

The Alliance recommendation for these credits was based on actual vehicle testing, quantifying the credit as the incremental 5-cycle test benefit over the 2-cycle benefit (although the 2-cycle benefit is zero, since the heater would never be “on” for 2-cycle test temperatures). The Alliance recommendation should fit ICCT criteria for a credit. All of the ICCT criticisms of EPA’s calculations for this technology become moot if the actual vehicle test data are used (e.g., time at idle, electricity to run the pump, and any engine warm-up at idle). [EPA-HQ-OAR-2010-0799-11790-A1, p.4]

d. Active Aerodynamic Technologies

Active aerodynamic features have been in production for some time, and the performance is reliable and well understood. The factors that ICCT notes do not create a significant deterioration or uncertainty in the benefits. For example, when there is a risk of freezing, active grill shutters are typically “deactivated” by placing them in the closed position, which maximizes the aerodynamic benefits while also hastening powertrain warm-up. This “ice mode” for active grill shutters is typically activated for all temperatures below approximately 40-45oF (vehicle temperature sensors typically indicate slightly warmer temperatures than the true ambient, so an indicated temperature in this range is chosen since the true ambient may be close to the temperature for ice formation). The shutters are kept shut, even as the temperature warms, for a sufficient time for any ice to melt. So a significant portion of real world vehicle operation is conducted in cold weather where the benefits of active grill shutters are actually higher than would be measured on the standard FTP/HWY test cycles. [EPA-HQ-OAR-2010-0799-11790-A1, p.4]

For ambient temperatures above approximately 80oF, active grill shutters are typically kept open to provide ample air flow for both the powertrain and the air conditioner. Opening the shutters in this condition actually saves fuel compared to the alternative of making the air conditioner and engine cooling fan work harder. For mild ambients - between approximately 45-80 oF - active grill shutter operation is typically controlled in accordance with the engine cooling fan, so the control system is fairly sophisticated in maximizing fuel economy while providing adequate air flow. We do not know how EPA simulations for this technology included these various modes, but it can be easily seen that this technology provides higher benefits in certain off-cycle conditions, such as high speeds and cold weather, and is therefore suitable for an off-cycle credit. Further, the conditions where the system is “deactivated” do not uniformly reduce the benefit, but would be expected, on balance, to actually increase the net real world benefit, given the large proportion of time spent with the shutters closed in “ice mode.” Active air dams operate similarly. Adjustable ride height is comparatively simple in operation, with straightforward high speed benefits. [EPA-HQ-OAR-2010-0799-11790-A1, p.4]

As recommended by the Alliance, a good performance criterion for these credits is the coefficient of drag (Cd) of the vehicle when the active aero features are deployed. A close relationship exists between Cd and the overall greenhouse gas savings, which can be the basis for granting credits based on Cd, thereby encouraging the maximum possible implementation of these technologies. It is not realistic to require case-by-case vehicle testing for these technologies, which would be prohibitively burdensome, thereby greatly slowing progress in this promising area. [EPA-HQ-OAR-2010-0799-11790-A1, p.5]

e. Active Engine and Drivetrain Warm-up

ICCT makes the case that off-cycle credits for active engine and transmission warm-up are “highly questionable,” since “most of the benefit of the warm-up systems will occur on-cycle during 2-cycle testing” (ICCT Comments, p. 46). ICCT bases this on an assertion that the amount of warm-up on the FTP, measured in degrees of engine temperature, is about two-thirds of the warm-up on the 20oF cold cycle:

However, normal engine operating temperatures are about 180oF. This is about 105oF above the FTP test temperature and about 160oF above the 20oF test temperature. Thus, the benefit of active engine warm-up on the FTP should be about two-thirds of the benefit at 20oF and the proportional benefit will be even closer. (ICCT Comments, p. 45). [EPA-HQ-OAR-2010-0799-11790-A1, p.5]

This analysis is grossly incorrect, since it omits the viscosity behavior of fluids such as engine oil and transmission fluid at low temperatures. Viscosity is the measure of a fluid’s resistance to flow, or fluid friction, and is therefore strongly related to powertrain and driveline efficiency. Kinematic viscosity increases exponentially as temperature falls, such that the viscosity of engine oil and transmission fluid is many times higher at the start of the cold test compared to the FTP. The graph below shows this for some common engine oils. At the starting temperature for the cold test (which at 20oF is actually -6.7oC, well below the starting point for this graph), viscosity would be above 600 centistokes (cSt). In contrast, at the start of the FTP, around 24oC, viscosity is around 125 cSt. Therefore, engine friction could be reduced several times by warming the temperature of the engine oil rapidly into the range of the FTP. Transmissions and transmission fluids behave similarly, as do rear differentials, etc. That is why accelerated warm-up of these components produces significant off-cycle benefits in cold weather. Improvements in engine oil viscosity taper off above 50oC, to the normal engine operating temperatures above 80oC, so most of the benefits of these technologies occur off-cycle and not on the two-cycle tests. [EPA-HQ-OAR-2010-0799-11790-A1, p.5]

f. Ventilated Seats and Other Ventilation Technologies

ICCT suggests that credits for ventilation technologies are not appropriate because they are based on “limited data”, and the driver response is “unclear” (ICCT Comments, p. 39). However, there are additional supporting studies and data beyond the series of National Renewable Energy Laboratory (NREL) studies that were cited in the EPA analysis. For example, studies of thermal comfort from heated and cooled seats were performed at the Technical University of Denmark, resulting in technical publications such as the summary in the journal “Ergonomics” in 2007 by Zhang, Dyon, Fang and Melikov (Vol. 50, Issue 4, pp. 586-600, “The Influence of Heated or Cooled Seats on the Acceptable Ambient Temperature Range”). [EPA-HQ-OAR-2010-0799-11790-A1, p.6]

Quoting the abstract of this study:

In 11 climate chamber experiments at air temperatures ranging from 15 to 45 degrees C, a total of 24 subjects, dressed in appropriate clothing for entering a vehicle at these temperatures, were each exposed to four different seat temperatures, ranging from cool to warm. In one simulated summer series, subjects were preconditioned to be too hot, while in other series they were preconditioned to be thermally neutral. They reported their thermal sensations, overall thermal acceptability and comfort on visual analogue scales at regular intervals. Instantaneous heat flow to the seat was measured continuously. At each ambient room temperature, the percentage dissatisfied was found to be a second-order polynomial function of local heat flow. Zero heat flow was preferred at an air temperature of 22 degrees C and the heat flow that minimized the percentage dissatisfied was found to be a single linear function of air temperature in all conditions. The analysis indicates that providing optimal seat temperature would extend the conventional 80% acceptable range of air temperature for drivers and passengers in vehicle cabins by 9.3 degrees C downwards and by 6.4 degrees C upwards. [EPA-HQ-OAR-2010-0799-11790-A1, p.7]

Only 20% of occupants were dissatisfied by the cabin temperature in the range from 10.8o to 34oC when the seat was heated or cooled optimally, according to a simple control strategy that changed seat heat flux as a linear function of ambient temperature. Regarding the potential for lower air conditioner usage in hot weather, it was concluded that 80% of occupants would be satisfied by seats that were cooled even if the cabin temperature was raised by up to 6.4oC. Note that this is more than the cabin temperature increases used in the NREL studies as the basis for their calculations of the fuel savings from reduced air conditioner usage due to ventilated seats. Making a rough estimate based the EPA factors for translating cabin temperature reductions to CO_2 reductions (Draft Joint Technical Support Document (TSD), p. 5-73), that 6.4oC temperature change would equal a 1.9 gCO_2/mile credit for cars and a 2.6 gCO_2/mile credit for trucks. The proposed off-cycle credits of 1.0 gCO_2/mile for cars and 1.3 gCO_2/mile for trucks, based on the NREL study, are modest in comparison. [EPA-HQ-OAR-2010-0799-11790-A1, p.7]

Also, the seat heat flux of 60 W/m2 in the NREL study (Figure 11) equals the optimal flux in the Zhang study at about 37oC (Figure 8). Thus, the actual seat heat transfer performance of the production seats in the Cadillac STS used in the NREL study is more than sufficient to achieve the results seen from the laboratory set-up used by Zhang et al, at least through ambient temperatures up to 37oC. Therefore, the comfort results quantified by Zhang et al can be achieved using actual ventilated seat components that are already in the market. Moreover, the air conditioner energy savings attributed to ventilated seats by NREL are not excessive compared to similar estimates for related thermal technologies in the TSD and elsewhere. [EPA-HQ-OAR-2010-0799-11790-A1, p.7]

This Technical University of Denmark data and the resulting polynomial function are summarized in the chart below. [EPA-HQ-OAR-2010-0799-11790-A1, p.7] [[See Docket Number EPA-HQ-OAR-2010-0799-11790-A1, p.8 for the chart.]]

Ventilated seats are a popular feature on luxury vehicles, despite the typically high price. Therefore, if the feature becomes more widespread as a result of the off-cycle credit program, it can be expected that the “driver response” will be to learn to appreciate and use this luxury feature, which provides quicker cool-down, as well as fuel savings. When the ventilated seats are in use, it can be reasonably expected that the air conditioner would be turned down to maintain comfort levels, providing the energy savings and emission reductions estimated in these analyses. [EPA-HQ-OAR-2010-0799-11790-A1, p.8]

g. Active and Passive Ventilation

As with ventilated seats, more research data and field experience is available for active and passive ventilation than was cited in the EPA TSD. Several manufacturers already offer active or passive ventilation technologies on production vehicles. The 2010 Toyota Prius began offering options of a solar panel ventilation system and a remote air conditioning controls system, both designed to reduce cabin temperature when the vehicle is parked in hot ambient conditions. Data has been provided by Toyota to the EPA on the performance of the Prius solar panel ventilation, corroborating the NREL report which EPA used as the basis for its proposed active ventilation off-cycle credit. Furthermore, market experience has already shown these features to be quite popular, as the projected installation rate of 3% has been actually running at 12% - which equates to about 50,000 units sold. Given the popularity of the solar panel ventilation system and the potential for expanding this technology to provide additional electrical energy to power the vehicle, it would be prudent for EPA to encourage development via off-cycle credits, rather than defer credits as ICCT suggests. [EPA-HQ-OAR-2010-0799-11790-A1, pp.8-9]

In addition, General Motors commissioned NREL in 2008-2009 to analyze over a dozen variations of active and passive ventilation, as well as additional combinations of ventilation technologies with solar reflective technologies, with the goals of identifying the most effective combinations, as well as validating a comprehensive range of improved thermal modeling methods. [EPA-HQ-OAR-2010-0799-11790-A1, p.9]

The ventilation technologies used the existing HVAC blower or additional fans at various power levels to provide either continuous or pulsed exchanges of fresh air into the vehicle. Based on a standardized solar load of 800 W/m2, among the variations using solely active ventilation, five out of twelve applications produced average interior temperature reductions during solar soaks in excess of the 6.9oC reduction measured in the older NREL study which was used as the basis for the proposed off-cycle credit. The biggest reduction was 11.4oC. Moreover, six of the lowest performing active ventilation applications were simply low-wattage versions of a system that achieved a 7.2oC average interior temperature reduction in its seventh, most high-powered application. Since each version of this system would cost the same, regardless of the wattage, the low-performance versions of this system can be disregarded as not commercially attractive when compared to the version that achieved a 7.2oC reduction at the same cost. If these low-powered systems are disregarded, only one application achieved an interior temperature reduction of less than 6.9oC, while five systems surpassed the 6.9oC reduction level. [EPA-HQ-OAR-2010-0799-11790-A1, p.9]

In comparison, a very simple passive system that opened the windows 2 cm achieved an average interior temperature reduction of 3.5oC, and also provided an additional improvement of approximately 1.5oC when combined with one of the active ventilation technologies. While this system was not as sophisticated as the one evaluated by EPA as the basis for the passive ventilation credit, it shows that there is significant potential for low cost emission reductions from this passive ventilation approach. [EPA-HQ-OAR-2010-0799-11790-A1, p.9]

In summary, the early experience with active and passive ventilation technologies has been promising, and the interior temperature data from these experiences supports the levels of off-cycle credit proposed by EPA. We therefore urge EPA to offer the proposed credits to encourage further progress in implementing and improving these technologies. [EPA-HQ-OAR-2010-0799-11790-A1, p.9]

Response:

The EPA agrees with the comments from the Alliance that the "off-cycle technology credit menu is a necessary addition to the off-cycle program" and appreciates the accolade that it is a "great addition to the GHG reduction and corporate fuel economy programs." As a result we are finalizing this rule with the off-cycle technology credit menu.

Regarding the Alliance comments that "recommend[ed] revisions to the proposed credit amounts", the EPA responded to the comments regarding each of these technologies in greater detail in Chapter 5.2 of the TSD and Preamble II.F of this final rule. Specifically, our responses for each of the technologies on the off-cycle technology menu can be found in TSD Chapter 5 as follows: High Efficiency Exterior Lighting (5.2.3), Waste Heat Recovery (5.2.2; formerly termed "Engine Heat Recovery"), Solar Panels (5.2.4), Active Aerodynamic Improvements (5.2.6), Active Drivetrain Warm-Up (e.g., Active Transmission Warm-Up; 5.2.8.3), Active Engine Warm-Up (5.2.8.4), Thermal Control Technologies (5.2.9) including Glazing (5.2.10), Solar Reflective Paint (5.2.12), Active Seat Ventilation (5.2.11), Active Cabin Ventilation (5.2.13), and Passive Cabin Ventilation (5.2.13). In addition, our responses regarding additional technologies that the Alliance recommended we consider adding to the off-cycle technology credit menu or allowing credit for including: High Efficiency Alternator, HVAC Eco-Mode, Bypass Valve for Transmission Oil Cooler, and Electronic Thermostat and Electric Water Pump; are discussed in Section II.F.2. of the preamble for this final rule. Finally, our responses to the comments from the Alliance regarding clarifying the technology definitions are included in TSD Chapter 5 and the definitions for specific off-cycle technologies can be found in 5.2.5, 5.2.7., 5.2.8.5, and 5.2.15.

The EPA also agrees with and appreciates the supplemental comments from the Alliance. The EPA sought to ensure that the off-cycle credits for technologies on the off-cycle technology menu were verifiable and supported by data. This supporting information from the Alliance was helpful to support the basis for the credit values that we are finalizing in this rule.

Organization: Association of Global Automakers, Inc. (Global Automakers)

Global Automakers supports the availability of credits for technologies that provide on-road efficiency and emissions benefits but whose benefits are not fully measured using the current city-highway test. In a number of cases, these technologies are currently known, as indicated by the "menu" of credits developed by the agencies for the proposed rule. However, given the long time-frame for the proposed standards, it is very possible that additional technologies will be identified which should qualify for off-cycle credits, and the characteristics of these technologies cannot currently be predicted. In order to provide an incentive for manufacturers to pursue the implementation of these technologies and realize the resulting benefits, it is important that the agencies provide maximum flexibility to manufacturers to obtain credits. For these reasons, we urge the agencies to avoid imposing unnecessary restrictions on qualification for off-cycle credits. The proposed rule establishes numerous restrictions on the use of off-cycle credits which appear to be arbitrary and unnecessary to the effective functioning of the GHG and CAFE programs. [EPA-HQ-OAR-2010-0799-9466-A1, p. 5]

(1) The pre-approved technology "menu." Global Automakers supports the inclusion of the menu in the regulations as a default list of pre-approved technologies, with manufacturers being authorized to petition for larger credit or credits for additional technologies, based on credible data. [EPA-HQ-OAR-2010-0799-9466-A1, p. 5]

The agencies should also update the menu list from time-to-time, as they receive information on additional technologies that provide off-cycle benefits. Inclusion of technologies on the pre-approved menu provides a significant incentive for manufacturers to implement those technologies, so the menu should be as comprehensive as possible. One example of such a technology that is mentioned in the comments on the proposed standards is high efficiency alternators. This technology provides benefits greater than those measured in 2-cycle testing, since its efficiency advantage is applied to the electrical loads of equipment that is operated during typical on-road driving but that is not operated during 2-cycle tests (e.g., lighting, radio, etc.). [EPA-HQ-OAR-2010-0799-9466-A1, pp. 5-6]

EPA should not maintain any of the restrictions on off-cycle credits in the absence of a strong showing of need for the restriction. Additionally, we believe that the agencies should update the off-cycle credits menu in the mid-term review. [EPA-HQ-OAR-2010-0799-9466-A1, p. 7]

Response:

The EPA agrees with the comments from the Global Automakers that it is important to "provide an incentive for manufacturers to pursue the implementation of these technologies and realize the resulting benefits" and we believe the off-cycle program achieves this.

In contrast, the EPA disagrees with statements from the Global Automakers that all of the eligibility criteria to receive off-cycle credits are "arbitrary and unnecessary to the effective functioning of the GHG and CAFE." We did revise the criteria for receiving off-cycle credit menu default values by eliminating the requirement for 10% market penetration for the technologies on the off-cycle technology menu (see Preamble III.C.5.b.i.). However, other criteria such as the 10 g/mile total cap for menu-based credits have been retained since these criteria "balanc[e] the goal of providing a streamlined pathway to encourage significant introduction of innovative off-cycle technologies with the uncertainty inherent with the estimated level of credits being provided" (see Preamble III.C.5.b.i.). Therefore, other than the 10% market penetration rate requirement, we believe that the eligibility criteria for the default credit values in the menu are appropriate. Manufacturers may, of course, seek credits in greater amounts for the technologies on the menu using the case-by-case demonstration procedures.

The EPA agrees with the comments from the Global Automakers that we should review the list of technologies and consider additions to the off-cycle technology menu. EPA will continue to closely watch new technologies and evaluate applications for new off cycle credits as they come in.

Finally, the comments from the Global Automaker regarding high efficiency alternators are discussed in greater detail in Section II.F.2. of the preamble for this final rule.

Organization: Bosch

The agencies have recognized certain technologies, while having a measurable impact on CO_2 and fuel economy on the 2-cycle test, have an even greater impact off-cycle and as such the agencies have included these technologies on the pre-approved off-cycle technology credit list. Bosch commends the agencies for the inclusion of stop/start and active aerodynamics on this off-cycle list. In response to the agencies' request for input regarding the off-cycle credit list, Bosch is proposing the addition of brushless technology for engine cooling fans and high efficiency alternators to the pre-approved off-cycle technology credit list. [EPA-HQ-OAR-2010-0799-9462-A1, p. 2]

Brushless technology (EC) for Engine Cooling Fans – This high efficiency technology for electrical motors / drives should be added to the pre-approved list of technologies for off-cycle credits. Most of today's vehicles utilize brushed motors (DC) in a series-parallel dual fan configuration, which allows for only three fan power levels. In a typical high-power system, these levels could equate to 0 watts (OFF), 170 watts (Low Speed), and 660 watts (High Speed). Transitioning from series-parallel brushed motors to advanced brushless motor technology reduces average vehicle electrical power consumption by 81 watts (Appendix A) – resulting in a direct fuel economy improvement of 0.27 mpg assuming standard measurements and calculations that form a general rule that reducing vehicle electrical consumption by 30 watts will result in a fuel economy improvement of 0.1 mpg. Field data at major OEMs have proven this relationship over a number of years for both passenger cars and light duty pickups. [EPA-HQ-OAR-2010-0799-9462-A1, pp. 2-3]

High Efficiency Alternators – While Bosch recognizes high efficiency alternators were included as an integral technology in the setting of the standards, and are thus precluded from off-cycle credits, the fuel savings and CO_2 reduction attributable to high efficiency alternators are greater in the 5-cycle versus the 2-cycle tests. Alternator efficiency plays an even greater role in real life applications and drive cycles where a higher, more realistic vehicle load is encountered. The base alternator efficiency assumed in the NPRM is approximately 65%. Increases in alternator efficiency to 75% and up to 82% can be realized using a combination of existing and new technologies respectively. Alternators with increased efficiency are a drop-in replacement with no other changes needed to the vehicle architecture. Bosch therefore recommends the addition of high efficiency alternators to the pre-approved off-cycle technology list. [EPA-HQ-OAR-2010-0799-9462-A1, p. 3]

An example demonstrating the effect of a high efficiency alternator is provided in Appendix B. In tests on a GM 2.4L 4 cylinder gasoline engine, an increase in alternator efficiency of 10% resulted in 1.23% improvement in fuel economy on the 2-cycle test and 1.93% improvement on the 5-cycle test. Typical vehicle electrical loads are included in the appendix. At higher, more real world electrical loads, this off-cycle benefit would have an even greater impact on fuel consumption. Upon request, additional calculations using the MOVES model as well as additional 5-cycle test data can be provided. [EPA-HQ-OAR-2010-0799-9462-A1, p. 3]

Response:

We appreciate the comments from Bosch and the supporting information that the company supplied. However, we disagree with Bosch that high-efficiency alternators and brushless technology for engine cooling fans should be added to the off-cycle technology menu.

Our detailed responses to the comments from Bosch on additional technologies for the off-cycle technology menu are in Section II.F.2. of the preamble for this final rule. To summarize, we are not adding high efficiency alternators and brushless technology for engine cooling fans to the off-cycle credit menu due to the variability in implementation strategy and electrical loads for the systems and related components. This makes it difficult to pinpoint a single, default value for the off-cycle technology menu. Therefore, we feel that these technologies are better suited for off-cycle credit consideration using the alternate case-by-case approval process for technologies not on the off-cycle technology menu. As a result, manufacturers may seek off-cycle credit for high efficiency alternators and brushless technology for engine cooling fans but must make an individualized demonstration in order to obtain such credits.

Organization: Chrysler Group LLC

The Agencies have established separate credits for off-cycle technologies which are expected to have different greenhouse gas and fuel consumption benefits for passenger cars and light-duty truck. Similar to many of the other off-cycle technologies, active engine and transmission warm-up technologies are expected to yield a greater absolute benefit for light-duty trucks. [EPA-HQ-OAR-2010-0799-9495-A1, p. 6]

Recommend improvements to the process for qualifying additional off-cycle technologies; [EPA-HQ-OAR-2010-0799-9495-A1, p. 9]

And provide numerous other technical comments and recommendations on off-cycle technologies. [EPA-HQ-OAR-2010-0799-9495-A1, p. 9]

Support the establishment of a table of pre-approved off-cycle technologies with defined greenhouse gas and fuel consumption benefits; [EPA-HQ-OAR-2010-0799-9495-A1, p. 9]

Support expansion of the pre-approved off-cycle technology list; [EPA-HQ-OAR-2010-0799-9495-A1, p. 9]

The Agencies propose a pre-approved table of greenhouse gas and fuel consumption improvement values for GHG and CAFE compliance applicable to the 2017-2025 MYs. The Agencies note that this “Off-Cycle Technology Table” would “significantly streamline and simplify the [off-cycle credit] program for manufacturers choosing to use it and would provide manufacturers with certainty that credits may be generated through the use of pre-approved technologies.” EPA further notes that the values in the Off- Cycle Technology Table were developed using “a combination of available activity data from the MOVES model, vehicle and test data, and EPA’s vehicle simulation tool to estimate a proposed credit value EPA believes to be appropriate.” The approach of the Off-Cycle Technology Table makes sense. By providing manufacturers certainty that their efforts to improve real-world greenhouse gas emissions and fuel economy will be taken into account for compliance purposes, the Agencies encourage the adoption of these technologies. [EPA-HQ-OAR-2010-0799-9495-A1, p. 9]

Chrysler recommends that the Agencies define separate passenger car- and light-duty truck-specific credits for active engine and transmission warm-up technologies. [EPA-HQ-OAR-2010-0799-9495-A1, p. 10]

EPA is proposing to establish a list of pre-defined and pre-approved off-cycle technologies. This list contains three basic technology types according to the Agencies’ Draft Joint Technical Support Document7 (“DJTSD”): technologies which reduce or offset electrical loads; active aerodynamic improvement technologies; and advanced load reduction technologies. [EPA-HQ-OAR-2010-0799-9495-A1, p. 10]

The advanced load reduction technologies proposed for inclusion in the pre-defined and pre-approved list are engine start-stop (idle off), electric heater circulation pump, active transmission warm-up, active engine warm-up, and thermal/solar control technologies. All of these advanced load reduction technologies, except for active transmission and active engine warm-up, have passenger car and light-duty truck-specific credits derived for them based on their relative benefit for cars and trucks. In the case of active transmission and engine warm-up, EPA based the estimated benefits on a mid-size car only. EPA should treat all advanced load reduction technologies in a similar manner by estimating passenger car and light-duty truck-specific credits for active transmission and engine warm-up technologies. [EPA-HQ-OAR-2010-0799-9495-A1, p. 10]

If additional technologies are added to the pre-defined and pre-approved off-cycle technology list, Chrysler supports passenger car and light-duty truck specific credits where such technologies affect vehicle greenhouse gas emission and fuel consumption in a similar manner to advanced load reduction technologies. [EPA-HQ-OAR-2010-0799-9495-A1, p. 10]

Response:

We appreciate the comments from Chrysler Group LLC and agree with the comments on establishing a table of pre-approved off-cycle technologies and credit values, and improvements to the process for qualifying additional off-cycle technologies.

Regarding the comments from Chrysler for separate passenger car and light-duty truck-specific credits for active transmission and engine warm-up technologies, we reviewed our estimates for active transmission warm-up and active engine warm-up and revised the default credit amount as discussed in Section 5.2.8.3 and 5.2.8.4, respectively of Joint TSD Chapter 5 and Section II.F.2. of the preamble for this final rule.

Based on our revised estimates, we agree with Chrysler that there is a clear difference in the benefit of active transmission and engine warm-up technologies between passenger cars and light-duty trucks. Therefore, we are including separate car and truck credits on the off-cycle technology menu for active transmission and engine warm-up of 1.5 grams/mi for cars and 3.2 grams/mi for trucks.

Organization: Denso International America, Inc.

DENSO has developed high efficiency alternators for use in light vehicles and, as a result, has significant expertise in this technology. These alternators have a higher degree of effectiveness in reducing real-world CO_2 emissions than is measured using the Federal Test Procedure/Highway Fuel Economy Test 2-cycle procedure. This difference in performance levels is similar to that of stop-start systems and active grill shutters, which are included in the pre-defined technology "menu" list in section 86.1866-12(d)(1)(i) of the agencies' proposed 2017-25 rule. Therefore, we request that EPA and NHTSA add high efficiency alternators to the off-cycle menu list along with the other technologies that have similar performance characteristics. [EPA-HQ-OAR-2010-0799-9269-A1, p. 1]

We would be pleased to work with EPA and NHTSA to develop any data or other information that EPA and NHTSA need in order to make a determination regarding the appropriateness of adding high efficiency alternators to add the pre-defined list. [EPA-HQ-OAR-2010-0799-9269-A1, p. 1]

I. Background.

EPA and NHTSA published on August 9, 2011 a Supplemental Notice of Intent announcing plans to propose stringent federal greenhouse gas and fuel economy standards for model year (MY) 2017-2025 light-duty vehicles (hereinafter referred to as the SNOI). The SNOI described high efficiency alternators as one of candidates for the off-cycle credits. However, the high efficiency alternator was not included in an applicable technology list of § 86.1866–12(d)(1) of the proposed rule. Therefore, the proposed off-cycle credit program does not allow manufacturers to obtain credits of the high efficiency alternator without EPA prior approval. Inclusion of the technology in the off-cycle menu is important, since it provides an assurance to vehicle manufacturers that they will receive a specified credit for use of the technology, significantly improving the marketability of the technology. In this way, the emissions and energy benefits of the technology will be maximized. [EPA-HQ-OAR-2010-0799-9269-A1, p. 1]

II. Electrical load over 2 cycle (FTP/HFET) test and real world condition.

High efficiency alternators supply electrical power to vehicle electrical equipment with less required engine power than normal efficiency alternators. The reduction of required engine power by the high efficiency alternators yields a corresponding reduction of CO_2 emissions. [EPA-HQ-OAR-2010-0799-9269-A1, p. 1]

The benefit of the high efficiency alternators over real world condition cannot be sufficiently captured by the 2 cycle (FTP/HFET) test procedure, however. This is because the electrical load over the 2 cycle test condition is much less than the load over real world condition. [EPA-HQ-OAR-2010-0799-9269-A1, p. 2]

DENSO estimates that the electrical load of vehicles over 2 cycle test conditions and real world conditions are as shown in Table 1. We estimate the electrical load over 2 cycle test conditions is 240W and over real world condition is 750W. If the electrical load of optional equipment which may be selected by the driver is considered, the real world electrical load is increased to 1470W. This means that the CO_2 reduction benefit by the high efficiency alternator, which we project to be 510W (750W – 240W) at minimum, is not captured by the 2 cycle test. Therefore, we believe that the high efficiency alternator is qualified as an off-cycle technology. [See Table 1 on page 2 of Docket number EPA-HQ-OAR-2010-0799-9269-A1] [EPA-HQ-OAR-2010-0799-9269-A1, p. 2]

According to the Draft Technical Support Document (TSD) for the NPRM, section 5.2.1, EPA and NHTSA estimate that a reduction of required engine power of 100W yields 3.0g/mi CO_2

emission reduction over the 2 cycle test and 3.7g/mi CO_2 emission reduction over the 5 cycle test. Table 2 shows our brief simulation of CO_2 reduction benefit by improving the alternator efficiency from an average 65% to average 75% and using the EPA and NHTSA study in the TSD and our estimation of vehicle electrical load. Based on this simulation, we can estimate that a 2.8 g/mi CO_2 reduction is available by improving of the alternator efficiency. This constitutes a substantial real world CO_2 emission reduction. Therefore, the high efficiency alternator should be included in the menu list of off-cycle credits to promote the introduction of the technology. [See Table 2 on page 3 of Docket number EPA-HQ-OAR-2010-0799-9269-A1] [EPA-HQ-OAR-2010-0799-9269-A1, pp. 2-3]

III. Off-cycle credit for high efficiency alternators in passenger car CO_2 emission regulation in Europe.

The European Union (EU) has adopted CO_2 emission reduction regulations for passenger cars effective in 2012, through their Regulation (EC) No. 443/2009. Regulation (EC) No. 443/2009 provides “eco-innovation” credits, which are similar to the U.S. proposed off-cycle credits. The eco-innovation credits are available for technologies whose CO_2 reduction benefit cannot be fully measured using the EU CO_2 emission test methodology (New European Driving Cycle, “NEDC”). [EPA-HQ-OAR-2010-0799-9269-A1, p. 3]

On July 25, 2011, the EU published a regulation (Commission Regulation (EU) No. 725/2011) and a technical guideline document to establish type approval procedures for eco-innovation credits. The technical guideline document describes the high efficiency alternator as one of the technologies that qualifies for eco-innovation credits, and establishes the credit calculation methodology for such alternators. This methodology should be considered by EPA and NHTSA as a reference for developing an off-cycle credit for high efficiency alternators in the U.S. final rule. According to the guideline, because the electrical load of the vehicle over real world conditions is larger than the load over NEDC test, the CO_2 reduction benefit of the high efficiency alternator cannot be sufficiently measured using the NEDC test. Therefore, EU determined the high efficiency alternator as one of technologies that qualifies for eco-innovation credits. See the technical guideline at http://ec.europa.eu/clima/policies/transport/vehicles/cars/docs/guidelines_en.pdf [EPA-HQ-OAR-2010-0799-9269-A1, p. 3]

The eco-innovation credit calculation methodology for the high efficiency alternator is described in paragraph 8.4 of the EU technical guideline. The credit of the alternator is calculated as follows. [See the calculation on page 4 of Docket number EPA-HQ-OAR-2010-0799-9269-A1] [EPA-HQ-OAR-2010-0799-9269-A1, p. 4]

Response:

We appreciate the comments from Denso International America, Inc. and the supporting information that they supplied. However, we disagree with Denso that high-efficiency alternators should be added to the off-cycle technology menu.

Our detailed responses to the comments from Denso on the addition of high-efficiency alternators to the off-cycle technology menu are in Section II.F.2. of the preamble for this final rule. To summarize, we are not adding high efficiency alternators to the off-cycle technology menu due to variability in implementation strategy and electrical loads for the systems and related components. This makes it difficult to pinpoint a single, default value for the off-cycle technology menu. Therefore, we feel that this technology is better suited for off-cycle credit consideration using the alternate method approval process for technologies not on the off-cycle technology menu. As a result, manufacturers seeking off-cycle credit for high efficiency alternators must pursue this path.

Organization: EcoMotors International, Inc.

It is vital that EPA continue to evaluate off-cycle technologies and consider adding technologies to the pre-approved list even after the Final Rule's adoption. Similarly, manufacturers should always have the ability to provide data for pre-approved technologies to demonstrate a credit value greater than that assigned on the EPA pre-approved list. EcoMotors encourages EPA to continue to provide as much guidance and certainty to OEMs as possible (via guidance letters or other mechanisms), as this program continues to evolve and as new technologies emerge and are developed. [EPA-HQ-OAR-2010-0799-9594-A2, p. 13]

Response:

The EPA agrees with the comments from EcoMotors International, Inc. The alternate method approval process for technologies not on the off-cycle technology menu is a pathway for manufacturers to “provide data for pre-approved technologies to demonstrate a credit value greater than that assigned on the EPA pre-approved list.” Therefore, we believe the provisions for the off-cycle credit program in this final rule address the comments from EcoMotors International, Inc.

Organization: Ford Motor Company

Further, we believe that there is opportunity to expand the menu beyond the currently proposed list to capture other fuel-saving technologies such as high efficiency alternators, HVAC Eco-Mode, transmission oil cooler bypass valves, and electronic thermostats and electric water pumps. The inclusion of these items to the list may encourage more widespread implementation of these technologies. The list of technologies (currently proposed and new) and credit levels, as proposed by the Alliance and supported by Ford, is shown below: [The list can be found on p. 16 of Docket number EPA-HQ-OAR-2010-0799-9463-A1] [EPA-HQ-OAR-2010-0799-9463-A1, p. 15]

The addition of the predefined technology menu is extremely beneficial to manufacturers as it provides a clear methodology to achieve credits for technologies that provide real world fuel economy benefits that are not reflected in the regulated test procedures. To improve this method even further, Ford agrees that several of the menu technology definitions should be revised to improve clarity or to broaden their scope of applicability. We also propose that some of the credits should be adjusted to higher levels, based on industry data, as detailed in the Alliance comments. [EPA-HQ-OAR-2010-0799-9463-A1, p. 15]

In addition to the technologies discussed and listed above, we anticipate working with EPA to establish the correct methodologies to account for benefits of in-vehicle systems that provide tools for more efficient driving. Driver coaching or feedback systems, such as Ford EcoMode, can result in more fuel efficient driver behavior (e.g., less aggressive acceleration or braking, more efficient shifting, etc.) and have already deployed successfully in our hybrid electric vehicles and the new Ford Focus. Similarly, vehicle maintenance alerts and reminders can help drivers ensure that their vehicles are operating efficiently; for example, Ford's Crew Chief program, offered to fleet customers, currently helps drive fleet efficiency through improved vehicle maintenance by communicating oil life and low tire pressure to the fleet manager. Opportunities to expand these capabilities could provide significant real world fuel savings across our customer fleet. Finally, route planning tools can assist drivers in finding the best route as well as avoiding (and thus reducing) congestion. Real world benefits to both greenhouse gas emissions and fuel economy can be achieved through these technologies, and while quantifying the benefit is an acknowledged challenge, we look forward to further discussion with the agencies. [EPA-HQ-OAR-2010-0799-9463-A1, p. 16]

While the pre-approved technology list is only proposed to apply for 2017 and later MYs, Ford would support an allowance to also use it for 2012-2016 MY vehicles. If the same technologies are used prior to 2017, we believe they should be eligible for the same benefits. Such an extension of the menu would help to encourage earlier implementation of these technologies. [EPA-HQ-OAR-2010-0799-9463-A1, p. 17]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 44-47.]

Further, we anticipate working together to establish the correct methodologies to account for the benefits of driver-activated technologies. For example, coaching systems result in more fuel-efficient driver behavior as well as eco-route planning tools can provide a significant improvement in real-world fuel economy.

Response:

The EPA agrees with the comments from Ford Motor Company that "the predefined technology menu is extremely beneficial to manufacturers as it provides a clear methodology to achieve credits for technologies that provide real world fuel economy benefits."

Our responses to the comments from Ford Motor Company on additional technologies for the off-cycle technology credit menu including High Efficiency Alternators, HVAC Eco-Mode, Bypass Valves for Transmission Oil Cooler, and Electronic Thermostat and Electric Water Pump are discussed in Section II.F.2. of the preamble for this final rule. In summary, we are not adding these technologies to the off-cycle technology menu but credit for these technologies may be requested using the alternate method approval process for technologies not on the off-cycle technology menu. Responses to comments regarding off-cycle credit eligibility for crash avoidance and driver interactive technologies are likewise discussed in preamble section II.F 2.

Organization: Hyundai America Technical Center

1) Modifications to the Off-Cycle Menu: Hyundai supports the menu format for off-cycle technologies which will allow for a less burdensome path of accounting for the performance of several well-accepted technologies. [EPA-HQ-OAR-2010-0799-9547-A1, p.5]

2) Update of Off-Cycle Technology Menu: Hyundai recommends that the agencies conduct an annual update of the existing menu technologies to ensure that improvements in the technologies, which are likely to occur over the extended time period of the rule, are properly reflected in the menu. In addition, Hyundai strongly requests that the menu list be updated annually with new technologies that have been approved by the agencies. Hyundai believes it is unnecessary for manufacturers to generate burdensome confirmatory data of off-cycle technology benefits if the data is already available. Additionally, this has the potential of reducing the agencies' burden in reviewing redundant technologies and reducing the time and number of public review requests. [EPA-HQ-OAR-2010-0799-9547-A1, p.5]

Response:

We agree with the comments from Hyundai America Technical Center that the off-cycle technology menu "will allow for a less burdensome path of accounting for the performance of several well-accepted technologies." However, we disagree with the comments from Hyundai that the agencies should "conduct an annual update of the existing menu technologies to ensure that improvements are properly reflected in the menu."

The off-cycle technology menu was adopted to add a certain level of stability to the off-cycle credit program. Continually updating the off-cycle technology menu on an annual basis has the complete opposite effect. Further, the menu is part of the rule and can only be amended through notice-and-comment rulemaking proceedings.

In addition, the alternate demonstration methods for technologies not on the off-cycle technology menu offers a pathway for manufacturers to demonstrate benefits and request credit beyond the technologies (or the amounts) offered in the off-cycle technology menu. The off-cycle technology menu credit values are based on existing technology and currently available information using conservative estimates. As individual manufacturers develop specific technology that achieves greater benefits (than those listed on the menu), it would be imprudent to reflect this on annual basis in the off-cycle technology menu since not all vehicles are not expected to have identical technology effectiveness and implementation. Thus, credit values are expected to vary. Therefore, the alternate demonstration method process is better suited for case-by-case evaluations where there is insufficient data to support a default credit or where the level of credit may depend on a specific manufacturer's design.

Finally, regarding the Hyundai comments on burden, it should be noted that the information used in the alternate demonstration method process can be used as long as the off-cycle technology and the vehicle application remain unchanged. In this manner, this data can be carried over on an annual basis, provided no changes have occurred, thus reducing the burden for requesting and approving credit. Further, as Hyundai points out in their comments, if the data is already available to the manufacturer, there is no need to "generate burdensome confirmatory data of off-cycle technology benefits."

Organization: Mercedes-Benz USA, LLC

DAG supports credits to encourage vehicle technologies that reduce CO_2 emissions by reducing collisions resulting in fuel consuming traffic congestion. Below DAG suggests a package menu approach with conservatively-based credit opportunities that will encourage the deployment of these technologies and considerably reduce CO_2 emissions. [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

With regard to particular off-cycle credits, DAG supports the Alliance proposal for calculating the potential for High Efficiency Light Savings. However, in the event that the agencies do not adopt the Alliance proposal, DAG suggests that the agencies adopt EPA's methodology, as described in the draft Joint Technical Support Document (TSD § 5.2.1.1). DAG believes that all cars equipped with LED lighting systems should be eligible for an off-cycle credit, even if LED lighting is not used on all lamps throughout the vehicle. DAG proposes both that the credit be premised on the real power consumption of the LED-light systems actually incorporated into the vehicle, and further that both low and high beam LED light systems be eligible. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-3]

The process DAG envisions to account for this off-cycle credit would be that the manufacturer supply the agencies with electric power consumption of each LED light system on the vehicle. Using that data, the off-cycle credit can be derived according to the methodology described in Table 5.21 in the draft TSD, with the exception that the electric power consumption of the high efficiency LED system supplied by the manufacturer be used rather than the values in the table. This change in the methodology will not limit the off-cycle credit to vehicles fully equipped with high efficiency LED lighting; it will instead allow vehicles partially equipped with high efficiency LED lighting to also be eligible for the off-cycle credit. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-3]

As the agencies began to construct a CO_2 program complementing the traditional fuel economy program, EPA and NHTSA recognized that the traditional definition of 'fuel economy' is restrictive and that significant additional reductions in emissions and fuel consumption can be attained by encouraging the advent of vehicle-based technologies that reduce fuel consumption in ways that are not reflected in the federal test procedures. As a result, the agencies have included within their assessments CO_2 and fuel consumption reductions associated with enhanced air conditioning efficiencies and reduced refrigerant leakage. The agencies have also created an off-cycle CO_2 and fuel consumption improvement program to encourage the proliferation of technologies capturing these additional benefits. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-6-A-7]

Similar to off-cycle technologies are technologies that lead directly to CO_2 and fuel consumptions reductions by avoiding crashes and the associated traffic congestion they cause. Crash avoidance technologies serve not only to promote motor vehicle safety, but also to ease the flow of traffic and to mitigate traffic congestion that is associated with motor vehicle collisions. The real world CO_2 and fuel economy benefits of these technologies, when they are not mandated through regulation, should be recognized and their widespread deployment encouraged within the context of the GHG and fuel economy programs.[13] [EPA-HQ-OAR-2010-0799-9483-A1, p. A-7]

Below DAG sets forth the analytic foundation and the suggested elements of a program to encourage and to acknowledge the significant CO_2 and fuel consumption benefits associated with the potential for these technologies to reduce crash-induced congestion. While these benefits are derived independently of NHTSA's safety mission, promoting vehicle-based technologies that avoid crashes in order to reduce fuel consumption and CO_2 emissions is entirely consistent with that mission. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-7]

Significantly, in the context of saving fuel and reducing CO_2 emissions, the relevant linkage in terms of any technology's effectiveness is whether the agencies can link the technology to crash avoidance and enhanced traffic flow, not whether the agencies can link the technology to reduced fatalities and injuries. As a result, the technologies encouraged within the GHG and CAFE programs need not be premised on technologies already approved by NHTSA within the New Car Assessment Program or other safety programs linked to fatalities and injuries. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-7]

DAG acknowledges the inherent limitations in trying to quantify specific levels of CO_2 reductions to particular features. There is clear data, however, relating unnecessary fuel consumption to traffic congestion and traffic congestion to collisions. There is also data showing the effectiveness of certain crash avoidance technologies. The agencies have linked crash-induced congestion to excess fuel consumption and CO_2 emissions. With the CO_2 benefits of crash mitigation clear, the agencies have an opportunity to encourage significant additional emissions benefits through promoting crash avoidance technologies, and can do so through a process utilizing conservative assumptions. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-7]

The fact that crash avoidance technologies are a primary countermeasure within NHTSA's safety program should not preclude the agencies from gaining the substantial CO_2 and fuel consumption benefits associated avoiding crashes and enhancing the efficiency of the transportation system. The agencies need not limit their authority to advance the fundamental policies embedded in each empowering statute by focusing too narrowly on the specific type of regulatory action each has traditionally issued. The National Program in particular represents a regulatory transformation. Three government bodies are working together under a historic program to harmonize regulatory programs all aimed at common theme; and the historically separate considerations of emissions and safety have converged. This convergence is an opportunity to improve emissions reductions and fuel economy within the GHG and CAFE program with the corollary effect of also advancing motor vehicle safety. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-7]

The Clean Air Act obligates EPA to redress endangerments to public health and welfare arising as the result of the emission of air pollutants. The concept of welfare, in particular, is broad and encompasses a wide array of potential dangers. As set forth in more detail below, EPA has determined that traffic congestion is a substantial contributor endangering public health and welfare due to the excessively unnecessary amounts of fuel consumed, and also that climate change is leading to more weather-related traffic accidents and delays. Having already linked traffic accidents, congestion, climate change and the endangerment to public health and welfare, EPA is well within its authority under the Clean Air Act to redress the endangerment posed by undue CO_2 emissions caused by traffic crashes by encouraging the deployment of crash avoidance technologies. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-7-A-8]

Similarly, the CAFE program has long promoted the convergence of safety and fuel economy considerations. Not only has NHTSA long taken into account any potentially adverse safety implications that might arise from mass reduction, but also NHTSA has affirmatively designed the CAFE program with the explicit aim of addressing safety. Specifically, while it is widely acknowledged that weight is more closely aligned with fuel economy, the agency chose footprint as the attribute upon which to base the CAFE program. The decision to base the fuel economy program on a footprint attribute was expressly linked to the fact that doing so promoted motor vehicle safety in addition to fuel economy. NHTSA, therefore, has already inexorably linked the CAFE program with advancing its safety mission. The provision of congestion mitigation credits based on crash avoidance technologies is simply a further extension of the well-received policy decisions the agency has previously made. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-8]

EPA has also confirmed the correlation between reducing congestion from motor vehicle crashes and reducing emissions. In a recent report aimed at providing information to local governments on effective Transportation Control Measures, the agency noted that 'efforts to improve the efficiency of transportation ... help reduce air pollution and GHG emissions, improve energy security and independence, and save money. One of the specific measures suggested by EPA is to: [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-9-A-10]

Enhance incident management systems. Incident management systems focus on quickly clearing roadways of accidents and stalled vehicles. These systems typically include roving tow or service vehicles, motorist aid call boxes, contingency planning, and other means for quickly responding to incidents (U.S. EPA, 1998b). Traffic incidents account for about one-quarter of all congestion on U.S. roadways, and for every minute that a freeway travel lane is blocked during a peak travel period, four minutes of travel delay results after the incident is cleared (National Traffic Incident Management Coalition, Undated). Since traffic incident management helps to minimize and prevent congestion, these systems can reduce fuel consumption by more than I percent annually and save 2,600-7,700 gallons of gasoline per incident, thereby reducing associated vehicle emissions [U.S. DOT, Undated(d)]. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-10]

NHTSA's most recent Vehicle Safety and Fuel Economy Rulemaking and Research Priority Plan for 2011-2013 identifies the potential for crash avoidance technologies to reduce these congestion-causing collisions:

From the crash avoidance perspective, NHTSA looks at types of crashes that might be mitigated by new technologies. Based on the General Estimates System (GES) and the Fatality Analysis Reporting System (FARS), four types of crashes total 85 percent of all crashes. These include Run-Off-Road (23%), Rear-End (28%), Lane Change (9%), and Crossing Path (25%). [EPA-HQ-OAR-2010-0799-9483-A1, p. A-10]

Longitudinal assistance, lateral assistance, and driver attention monitoring can alleviate a significant number of these collisions. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-10]

The Agencies can Reasonably Estimate the Fuel Savings Associated with Crash Avoidance Technologies

Certain crash avoidance technologies have had enough exposure the market to establish that they have a statistically significant impact on reducing collisions. Data from the German insurance institute GDV/UDV shows that Advanced Driver Assistance Systems have significantly reduced collisions. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-10]

With 25% of the congestion in the United States due to traffic incidents, and an overall fuel loss from congestion of approximately 38 million tons, about 9.5 million tons of CO_2 loss annually is associated with traffic incidents. Scaling this loss to vehicle miles traveled results in approximately 6 grams CO_2 per vehicle per mile if all accidents could be avoided. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-10]

The longitudinal assistance technologies Forward Collision Warning and Adaptive Brake Assist have already been proven effective in real world field data. Scaling the GDV/UDV field experience to U.S. crash data, DAG estimates up to 15% of crashes could be avoided by deploying such a Primary Longitudinal Assistance Package. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-10-A-11]

Adding to the proven effectiveness of primary longitudinal assistance technology is a more Advanced Longitudinal Assistance Package incorporating Autonomous Emergency Braking and Adaptive Cruise Control. DAG estimates that such a system could potentially avoid up to 18% of crashes. This package provides the most advanced longitudinal anti-collision technology and is currently cost-effective only on high priced luxury vehicles. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-11]

There are other technologies where effectiveness estimates are more difficult to attain but where data suggests that the technology will have a significant positive impact on avoiding traffic collisions. NHTSA has already recognized lane departure warning as an effective crash avoidance technology (along with forward collision warning). Active Lane Keeping Assist combined with Blind Spot Assist provides a Lane Tracking Package that offers significant potential to reduce CO_2 both by averting up to 5% of crashes and by maintaining the flow of traffic by averting 'near misses.' [EPA-HQ-OAR-2010-0799-9483-A1, p. A-11]

Driver Attention Monitor is another promising technology. A survey of owners who have had the attention assistance feature in Mercedes vehicles for about a year found that the system was effective in helping drivers to avoid fatigue. Sixty-eight percent of those surveyed indicated that they took a break from driving when the attention assistance alerted them to the fact that their driving behavior had become more erratic.[20] Fatigue, in turn is a significant factor in traffic collisions.[21] [EPA-HQ-OAR-2010-0799-9483-A1, p. A-11]

Adaptive Forward Lighting systems provide enhanced visibility in a variety of driving conditions which enhance the driver's ability to safely operate their vehicle. Emerging field experience suggests these systems may be highly effective in reducing crashes. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-11]

There are currently accepted technical understandings regarding the definitional and/or performance criteria for many of the technologies listed below. Brake Assist systems are defined in ECE regulations (UN-R-13H, Annex 9, Part B). NHTSA's NCAP program already includes performance specifications for Forward Collision Warning and Lane Departure Warning, and the agency is working towards performance specifications for Dynamic Brake Support and Collision Imminent Braking systems. Adaptive Cruise Control and Lane Keeping Assist are subject to various ISO definitions which could be applied as appropriate. For those technologies where NHTSA is currently working, we would anticipate that the work would be complete well before Model Year 20 I7 and further that NHTSA or other standards organizations will address additional technologies, such as Attention Assist or Adaptive Forward Lighting. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-11]

Regulation to mandate new technology and/or to link technology directly to fatalities or injuries necessitates specific definitions and performance criteria to determine compliance or eligibility. DAG understands that NHTSA, SAE, ISO, and others are working towards concrete and performance based definitions applicable to ensuring that these features will result in reduced fatalities and injuries. However, the level of stringency needed to develop and validate functional definitions and objective test procedures for collision avoidance safety systems is necessarily causing this process to take a considerable amount of time. In the context of gaining the emissions and fuel economy benefits of reducing collision-induced congestion, there is no need to link the definitions and performance criteria to reduced fatalities and injuries; instead, technologies are appropriate if they can reasonably be shown to avoid accidents, and thereby reduce congestion and its associated fuel consumption and CO_2 emissions. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-11-A-12]

The chart below summarizes a proposed credit methodology with technology packages and suggested credit opportunities. DAG proposes that NHTSA allow a manufacturer to submit to the agency data specific to its product offerings showing that its technology is effective in reducing vehicles collisions. NHTSA may approve the application and determine the amount of the credit and would be assured that the technology is robust and effective in terms of crash avoidance and the consequent fuel savings.[22] [EPA-HQ-OAR-2010-0799-9483-A1, p. A-12]

DAG conducted an extensive review of the available literature, including published OEM studies by, for example, Honda and Bosch, and the German Insurance Institute GDV/UDV quantification of brake assist benefits for all crashes (including non-injury crashes) based on POL insurance data (20022006) case-by-case simulation. Consistent with DAG's suggestion that each company present its package, the benefits may be adjusted slightly to account for which features are included. For example, the GDV study finds that an emergency brake assist (EBA2) system with Forward Collision Warning and Adaptive Brake Assist results in an approximate 12% reduction in all passenger vehicle crashes in all crash types with all crash partners within the German study. Adaptive Brake Assist with Autonomous Emergency Braking (EBA2+) results in an approximate 13.9% reduction in all passenger vehicle crash types with all partners within the German study. Adjusting for the percentage of crashes that are rear-end crashes (22.2% in GDV vs. 28% in US) renders an effectiveness rate between 15.3% and 17.5% for these longitudinal assistance packages. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-12]

With regard to the Lane Keeping Package, NHTSA has estimated effectiveness of approximately 6%. This includes an assumption of 55% availability. Taking a more conservative approach, for this purpose it is reasonable to assume a 5% effectiveness rate in reducing crashes. The remaining technologies listed below will produce effectiveness data before and through the rulemaking model years and should be considered for inclusion in a congestion reduction credit program as they are becoming offered in the light duty fleet. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-12]

Individually and collectively these technologies will measurably diminish traffic incidents, and therefore fuel consumption. In light of the significant amount of fuel wasted every year in collision-induced congestion, applying maximum credit opportunities of 1 g/m or less per package places a conservative value on proliferating these technologies throughout the fleet. Manufacturers should be encouraged to incorporate all fuel saving and emissions reducing technologies into their offerings, whether those features reduce CO_2 emissions on a per vehicle basis or whether they reduce CO_2 emissions through technologies proven to be effective in reducing a significant cause of fuel-consuming congestion. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-13]

The Agencies Have Ample Legal Authority to Provide Congestion Mitigation Credits

Both EPA and NHTSA have ample legal authority to provide credits for fuel consumption improvements that lead directly to CO_2 reductions. In reviewing this authority, it is important to consider that providing credits for technologies that reduce fuel consuming congestion due to traffic congestion involves no policy trade-offs. To the contrary, the credits would promote each of the policies that both agencies are charged with promoting: environmental protection, fuel economy, public health and welfare and motor vehicle safety. As such, the suggested credit program is fully consistent with the public objectives underlying each of the agencies' enabling statutes and would be fully harmonious with all statutory provisions. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-13-A-14]

First, the legal authority for congestion reduction credits is similar to that utilized by the agencies to establish off-cycle and fuel consumption improvement credits for technologies that reduce CO_2 in ways that are not measured in the applicable and traditional fuel economy tests. There has been no dispute that EPA has the authority to promote further CO_2 reductions under the Clean Air Act. As the agencies have recognized, the authority to apply such credits under EPCA is based on EPA's authority to define the methodology to calculate fuel economy for purposes of determining compliance. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-14]

Second, the congestion reduction credits are wholly consistent with EPA's obligation to address the endangerment to public health and welfare identified as arising from the air pollutant at issue. In this case, EPA has found that part of the endangerment to public and welfare arising from climate change is a potential increase in traffic incidents. The agency concluded, for example, that 'the increase in heavy precipitation will cause increases in weather-related accidents, delays, and traffic disruptions in a network that is already being challenged by increasing congestion. Traffic congestion leads to excess CO_2 emissions and CO_2 emissions lead to more traffic congestion - creating a circle of endangerment and effect that can be diminished through the advent of technologies that help to avert the cause of the emissions and the resulting additional endangerment. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-14]

Third, a credit program that achieves CO_2 reductions while also advancing safety is also consistent with both the Clean Air Act and with EPCA. EPA has long considered any adverse safety impacts from mandating a particular emissions control technology. The agency, moreover, has construed 'effects on welfare' broadly to encompass an array of considerations that may result from the consequences of air pollution. The courts have also long upheld NHTSA's consideration of safety impacts when determining maximum feasible fuel economy standards. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-14]

Indeed, the agencies have embedded considerations of safety into the fabric of the regulatory program by taking safety considerations into account in deciding upon footprint as the attribute and in deciding on the structure of the curves. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-14]

The agencies need not base the legal authority to establish congestion reduction credits on the advancement of safety. The credits are independently justified by the fuel consumption and CO_2 reductions they create. Significantly, however, there is robust precedent for linking together the GHG program with advancing motor vehicle safety and promoting both CO_2 reductions and motor vehicle safety. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-14-A-15]

---

13 As with off-cycle credits, the fuel consumption reductions associated with these technologies need not be specifically accounted for when establishing the CO_2 and CAFE standards. These technologies represent another area where significant gains can be made if the agencies incentivize the widespread deployment of these technologies.

20 The attention assist operates by analyzing steering wheel movements for the driver and providing an alert when steering inputs deviate from that driver's normal pattern. Attention assist not only helps alert drivers to the need to rest when fatigued, but also can help alert drivers who have become distracted.

21 A NHTSA study showed that 80% of accidents and 65% of near-accidents are caused by the inattentiveness of the driver, including drowsiness. See NHTSA, The Impact of Driver

Inattention on Near-Crash/Crash Risk: An Analysis Using the 100-Car Naturalistic Driving Study Data, DOT HS 810 594 (Apr. 2006). Various studies have estimated that between 10 and 25% of severe traffic accidents can be attributed to driver drowsiness. NHTSA has reported that annually about 100,000 crashes in the U.S., with 40,000 persons injured and 1,550 killed, are the result of driver sleepiness. NHTSA, Research on Drowsy Driving, http://www.nhtsa.gov/Driving+Safety/Distracted+Driving/Research+on+Drowsy+Driving.

22 DAG does not believe that this process would overwhelm the agency. Agency personnel are already familiar with the technologies and much of the data relating to these technologies. This process would put the onus on each manufacturer to develop robust data regarding its technologies and to present that information in a clear and concise manner to enable the agency to make a determination as to whether the credit should be applicable. Manufacturers may be required to submit this data with their pre-model year report and/or in their EPA certification applications. This process is similar to applying for air conditioning credits and DAG believes it can be implemented efficiently and without the need for substantial agency resources to be devoted to an additional task.

Response:

We appreciate the comments from Mercedes-Benz USA, LLC and agree with the comments on high efficiency exterior lighting. As discussed in greater detail in Section 5.2.3 of TSD Chapter 5, we are allowing manufacturers to receive off-cycle credit for partial lighting elements and agree that the approach suggested by Mercedes-Benz makes sense. In addition, we are allowing scaling of the lighting elements if the benefits achieved exceed those set forth in Table 5-21, Section 5.2.3 of TSD Chapter 5.

However, we disagree with the comments from Mercedes-Benz regarding eligibility of crash avoidance technologies for off-cycle credits. This issue is discussed further in Section II.F.2. of the preamble for this final rule. As stated there, the agencies do not believe that a "calculable relationship between congestion mitigation and fuel/CO_2 savings directly attributable to individual vehicles produced by a manufacturer, or even to a manufacturer's fleet of vehicles" and that "for a technology to be "counted" under the credit provisions, it must make direct improvements to the performance of the specific vehicle to which it is applied." In addition, and importantly, in the agencies' judgment, evaluation of crash avoidance technologies is better addressed under NHTSA's vehicle safety authority than under a case-by-case off-cycle credit process.

Therefore, we are finalizing today that crash avoidance technologies are not eligible for off-cycle credit under any off-cycle credit pathway (e.g., off-cycle technology menu, alternate method demonstration process).

Organization: Motor & Equipment Manufacturers Association (MEMA)

In response to the agencies' request for input on off-cycle technologies and the "Pre-Defined Credit List," MEMA has a few proposals. [EPA-HQ-OAR-2010-0799-9478-A1, p.7]

Second, collectively, the MEMA supports the technologies, emissions and fuel consumption estimates in the NPRM's proposed Pre-Defined Credit List. The estimates presented in the NPRM tables are relatively on par, and, in some cases may even be on the conservative side. Also, MEMA believes there are other technologies currently in the field with proven off-cycle benefits that were not in the NPRM (some examples include high efficiency alternators and brushless motor technology for engine cooling fans). These and other technologies, as appropriate, should be considered for inclusion on the list. Since MEMA represents a wide variety of motor vehicle parts manufacturers that make a huge range of various products, components and systems, we fully expect individual member companies to submit comments and specific remarks not only about the Pre-Defined technologies list and their corresponding ranges in the NPRM, but also about adding to the agencies' "menu" of technology choices for the final rule. MEMA asks that the agencies consider and fully evaluate those requests that have comprehensive, valid and confirmed data demonstrating the real-world, off-cycle benefits for revision to or inclusion in the final rule's Pre-Defined Credit List. [EPA-HQ-OAR-2010-0799-9478-A1, p.7]

Fourth, with respect to the "engine heat recovery" technology credit in the tables and in the proposed regulatory text definition, MEMA finds the term not very descriptive and confusing; also, it is inadvertently interchanged in the NPRM with "exhaust heat recovery" (also see our comment in Section IX). The engine heat recovery technology mentioned in the agencies' Technical Support Document (thermoelectric) can, in fact, be used to recover exhaust heat or any other source of heat. The industry, academia, and the Department of Energy have called the group of technologies that fall under the rulemaking nomenclature of "engine and exhaust heat" as "waste heat recovery" (WHR) technologies. Utilizing recovered heat and repurposing for other vehicle tasks, increases efficiencies for all types of vehicles – internal combustion engines and hybrids, alike. In some cases, the WHR system generates electricity and in other cases it can be used to expedite the warm-up of engines, transmissions, rear axles, and even the passenger compartment, to reduce ancillary loads and, for hybrid vehicles, to speed up the transition to all-electric mode. The source of the waste heat – whether the exhaust stream, engine coolant EGR cooler, or other – is all dependent on numerous criteria selected by the OEM to produce the most cost-effective solution. [EPA-HQ-OAR-2010-0799-9478-A1, p.8]

In keeping with our technology-neutral thesis, MEMA recommends that all these technologies be classified as WHR and the credits be listed separately as has been proposed in the NPRM. If the technology converts waste heat into 100W of electrical power, regardless of the technology, then a 0.7 g/mi credit is applied. If the technology uses waste heat for active transmission or engine warm-up, then the 1.8 g/mi credit would be applied. Due to its significant benefit, a credit for using waste heat to warm the passenger compartment in hybrid vehicles should be considered. [EPA-HQ-OAR-2010-0799-9478-A1, p.8]

Furthermore, MEMA believes that essentially any WHR technology, beyond those listed in the proposal (such as, thermal control of electronics and vehicle cabin climate control) that achieves the significant improvements, efficiencies and goals of the Program, should be considered for credit. If the EPA and NHTSA desire to have separate nomenclature, then we recommend that they be more descriptive (but technology-neutral) and be consistent throughout the rule, rather than “engine” or “exhaust” heat recovery. For example, engine heat recovery could be labeled as “eWHR” for electric WHR. [EPA-HQ-OAR-2010-0799-9478-A1, p.8]

There are special cases where even off-cycle technologies are difficult to evaluate using traditional test methods (e.g., dynamometer testing, etc.). Advances being made in vehicle telematics can very directly influence driving behavior – but it requires active driver inputs. By providing information that will aid the driver to drive more efficiently, we propose that there are considerations made in the decision-making process to allow technologies that cannot be quantified literally, but rather could be argued to have a positive impact on fuel consumption reduction and improved emissions. For example, the use of real-time traffic information to avoid congestion has been demonstrated to significantly reduce CO_2 emissions. Since historical testing methodologies cannot accurately quantify these benefits, new test methodologies that currently do not exist must be developed. MEMA encourages the agencies to form a working “partnership” to develop new test methodologies. The use of existing statistical traffic data should be used as much as possible in analytically modeling and quantifying the benefits. Instrumented vehicles and road tests would be required to statistically validate the results of any analytical models. There is precedent for providing CAFE credits based on a projected usage factor of a fuel saving device. Since the actual real-world usage of a traffic avoidance system cannot be guaranteed for 100 percent of the time, a similar percentage credit should be applied based on the anticipated usage rate. In addition to real-time traffic technologies, the agencies should be open to consider other automatic and driver-initiated location content-based technologies that have been shown to reduce fuel consumption. [EPA-HQ-OAR-2010-0799-9478-A1, p.9]

Under the Pre-Defined Credit List and related tables, MEMA points out some needed clarifications. First, the term “engine heat recovery” – which is used in Tables II-11, III-17 and III-18, in the proposed regulatory text (§ 86.1866–12 at page 75383), and in the TSD (at page 5-62) – is contrary to the NPRM text at page 75023 in Columns 2 and 3, which uses the term “exhaust heat recovery” (emphasis added). MEMA believes the unwitting interchange of “engine” with “exhaust” in this instance was an error. Therefore, for clarification purposes, MEMA asks that as the agencies develop the final rule, they ensure the nomenclature used to describe “engine heat recovery” is consistent with the term’s application in the Tables and in the regulatory text and is not interchanged with the term “exhaust heat recovery.” (Please refer to Section VI.B.2. for more information.) [EPA-HQ-OAR-2010-0799-9478-A1, p.12]

Response:

The EPA agrees with the comments from the Motor & Equipment Manufacturers Association (MEMA) regarding the terminology and range of technologies considered for waste heat recovery. This is reflected in our responses in 5.2.2 and 5.2.5 (i.e., definitions) of Joint TSD Chapter 5.

Regarding the comments from MEMA on interactive, driver-based technologies, our responses on this topic are discussed in Section II.F.2., III.C and III.E.11. of the preamble for this final rule. As stated, we believe that there is a high burden of proof from the OEMs that off-cycle credits could be justified for these interactive, driver based technologies but manufacturers may pursue this using the alternate demonstration methods for technologies not on the off-cycle technology menu if they choose.

Organization: Natural Resources Defense Council (NRDC)

EPA should only provide credits for off-cycle technologies if such technologies can be verified as providing real and enforceable GHG reductions. Based on data in the Draft Joint Technical Support Document, some technologies on the pre-defined list do not meet these criteria. EPA needs to scale-back the technologies provided on the pre-defined list until sufficient evidence of verifiable real world GHG reductions is available to the public. [EPA-HQ-OAR-2010-0799-9472-A2, p. 3]

In general, NRDC believes EPA should only allow off-cycle credits for measures that meet the following conditions: [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

The agency has verified that the GHG reductions are real through actual testing and real-world, in-use testing data from a statistically representative fleet of vehicles. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

The magnitude of the credits offered per vehicle should account for any degradation (including potential for failure and operator misuse) in the off-cycle technology over the life of the vehicle and not base the credits solely on performance during the test or from simulation modeling. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

The credits must not double count reductions with that are partially captured over the 2-cycle tests. In some cases, technologies will also produce some measurable reductions in the 2-cycle test. EPA acknowledges that off-cycle credits are intended for technologies that provide benefits that are not fully captured on the 2-cycle test but may be partially captured. It is critical that credits awarded for off-cycle operations only account for the portion not captured on the 2-cycle test. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

EPA should ensure that the benefits of the technology can be verified and enforced in use. The agency should require the manufacturers to collect and provide real-world data on an ongoing basis. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

Additionally, test procedures should be subjected to periodic review to keep up with the latest technology advancements both in the off-cycle technologies and the other vehicle characteristics as each may impact the level of GHG reductions that should be attributed to the off-cycle technology. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

Meeting the above criteria is especially critical for technologies on the pre-defined list. In addition, EPA must ensure the following:

The pre-defined list should require actual, publically available representative test data and not just be based on computer simulation or limited data, which appears to be the case for many of the technologies on the pre-defined list. The agencies should also require the manufacturers to collect and provide real-world measurement data on an ongoing basis to validate the model and credit levels going forward. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

EPA must verify that there is no double-counting of benefits due to the interaction between multiple off-cycle technologies a manufacturer chooses to use. For example, credits for solar load reduction through glazing must account for improvements to the A/C system. A vehicle with a very efficient, low leak A/C system may only generate very small or insignificant benefits from the addition of glazing. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

NRDC does not support the full range of off-cycle credit opportunities in the pre-defined menu because some fail to meet criteria for verifiable real world GHG reductions based on data presented in the Draft Joint TSD. EPA itself acknowledges that the proposed credits "…were largely determined from research, analysis and simulations, rather from full vehicle testing…" [EPA-HQ-OAR-2010-0799-9472-A2, p. 15]

Active grill shutters is an example of a proposed credit that does not appear to be well supported by data. It is unclear how EPA developed its assumption of 3 percent improvement in aerodynamics, given that it does not provide the underlying manufacturing data that it relies upon and does not justify its assumption that the 3 percent improvement can apply over the entire drive cycle.40 The 5-cycle benefits are clearly dependent on how the manufacturer chooses to design its system and its durability. NRDC believes that the active grill shutters menu credits should not be provided at this time until further data is provided and put into the public domain. [EPA-HQ-OAR-2010-0799-9472-A2, p. 15]

The same general concerns apply to many of the other technologies on the pre-defined list. Before finalizing the pre-defined list, EPA should provide in the public domain much more data that it proposes to use to justify credit levels. [EPA-HQ-OAR-2010-0799-9472-A2, p. 15]

---

40 EPA and NHSTA. Draft Joint TSD. Page 5-65. [EPA-HQ-OAR-2010-0799-9472-A2, p. 15]

Response:

The EPA welcomes the comments from Natural Resources Defense Council (NRDC) and agrees with NRDC that off-cycle technology benefits must "be verified as providing real and enforceable GHG reductions." In addition, we agree that it is important that the credits be based on actual data, do not duplicate on-cycle benefits, and that "test procedures [for determining credits] should be subjected to periodic review to keep up with the latest technology advancements." We believe the off-cycle credit program provisions we are finalizing today achieve this and satisfy NRDC's concerns.

Regarding the NRDC comments that "[t]he magnitude of the credits offered per vehicle should account for any degradation (including potential for failure and operator misuse) in the off-cycle technology over the life of the vehicle," we believe such a dynamic approach would make administering the off-cycle program nearly untenable since it would require individual manufacturer' vehicle-specific failure rates, deterioration curves and failure modes for every off-cycle technology, and overlay this onto the off-cycle technology menu. In lieu of this complexity, we believe that the certification durability requirements used for other emissions components and applied to off-cycle technologies will provide similar results in a less complex fashion.

For the comments from NRDC that "EPA must verify that there is no double-counting of benefits due to the interaction between multiple off-cycle technologies a manufacturer chooses to use," EPA is finalizing the rule with the provisions for the 10 g/mi cap on off-cycle technology menu credits. In addition, we have revised certain technologies as discussed in TSD Chapter 5 (e.g., engine idle start-stop and electric heater circulation pump, solar panels and active cabin ventilation) to account for synergistic affects. Therefore, we believe that these measures will account for the interaction between multiple off-cycle technologies and prevent benefits from being double counted, where appropriate.

Next, NRDC stated in their comments that: "Active grill shutters is an example of a proposed credit that does not appear to be well supported by data. It is unclear how EPA developed its assumption of 3 percent improvement in aerodynamics, given that it does not provide the underlying manufacturing data that it relies upon and does not justify its assumption that the 3 percent improvement can apply over the entire drive cycle. The 5-cycle benefits are clearly dependent on how the manufacturer chooses to design its system and its durability. NRDC believes that the active grill shutters menu credits should not be provided at this time until further data is provided and put into the public domain." We believe that NRDC has misinterpreted this information and would like to clarify this below.

In the TSD to the proposal, Section 5.2.2, we stated that "the EPA conducted an analysis of the reduction in emissions corresponding to a general reduction of aerodynamic drag on a vehicle. Using EPA's full vehicle simulation tool described in EPA's draft RIA, the agency evaluated the change in fuel consumption for increasing reductions in aerodynamic drag." Later in this same section, EPA stated "Based on manufacturer data, active grill shutters provide a reduction in aerodynamic drag (Cd) from 0 to 5% when deployed. EPA expects that most other active aerodynamic technologies will provide a reduction of drag in the same range as active grill shutters. EPA also expects that active aerodynamic technologies may not always be available during all operating conditions. Active grill shutters, for example, may not be usable in very cold temperatures due to concerns that they could freeze in place and cause overheating. Control and calibration issues, temperature limitations, air conditioning usage, and other factors may limit the usage of grill shutters and other active aerodynamic technologies. Therefore, EPA is proposing to provide a credit for active aerodynamic technologies that any of these technologies will achieve an aerodynamic drag of at least 3% improvement."

Therefore, EPA used the simulation tool to develop a correlation between aerodynamic efficiency and CO2 reduction, as shown in Table 5-26 and Figure 5-11, Section 5.2.6 of TSD Chapter 5 for this rule, and simply referenced the manufacturer's data as validation of this correlation and to select credit value for active aerodynamics, not to develop the credit. As a result, EPA has documented the 3% value for the active aerodynamics credit. Subsequent to this rulemaking, the ALPHA (Advanced Light-Duty Powertrain and Hybrid Analysis Tool) that EPA used to perform this simulation will be available to the public and we encourage NRDC to examine its potential.

Finally, NRDC made the comments that “Before finalizing the pre-defined list, EPA should provide in the public domain much more data that it proposes to use to justify credit levels,” and “[t]he pre-defined list should require actual, publically available representative test data and not just be based on computer simulation or limited data.”

In response, we disagree with NRDC since EPA used currently available, public data to support the development of the off-cycle technology menu credits. In addition, any additional materials used as the basis for the off-cycle credit values are available in the public docket for this final rule (see EPA docket #EPA-HQ-OAR-2010-0799). The Alliance also submitted supplemental comments in response to the detailed comments from ICCT as discussed in TSD Chapter 5 for this rule regarding supporting data (see EPA docket #EPA-HQ-OAR-2010-0799) citing actual manufacturer test data to support the credit values they suggested. Much of the Alliance test data and proposed credit values aligned with EPA’s off-cycle credit values and serve to bolster the off-cycle technology menu credits that EPA determined. Consequently, the EPA feels there is sufficient information in the public domain to justify the credit values we are finalizing today.

Regarding the NRDC comments that we based the credits solely on vehicle simulation, the EPA light-duty vehicle simulation tool, Advanced Light-Duty Powertrain and Hybrid Analysis Tool or ALPHA, is discussed in greater detail in the RIA Chapter 2 of this final rule. For all of the off-cycle credits other than solar and thermal control technologies, a mix of actual vehicle data and vehicle simulation was used to develop the off-cycle credits. The ALPHA model depends on actual vehicle data (e.g., engine torque curves) to provide a reasonable (though not absolute) prediction of the fuel economy and GHG emissions of specific vehicles produced in the future. Therefore, none of the credit values are based solely on vehicle simulation or actual vehicle data since the vehicle simulation depends on actual vehicle data to function. Finally, in order to ensure transparency of the models and free public access, EPA has developed the tool in MATLAB/Simulink environment with a completely open source code. Subsequent to this final rule, this open source code will be made available to the public and we encourage NRDC to take advantage of this ability to evaluate the ALPHA tool.

Organization: Porsche Cars North America, Inc. (PCNA)

• Porsche supports the Alliance's comments on inclusion of additional technologies in the table of default off-cycle credits. However, our analysis shows that the potential GHG benefit for high efficiency alternators is on the order of 2.0 grams/mile. We therefore request that the Agencies allow a default credit of 1.6 grams/mile for this technology. In addition, our analysis shows that the potential GHG benefit for electronic thermostat can be realized in configurations which do not include an electric water pump. We therefore request that the Agencies not limit this off-cycle credit to such configurations, but to instead allow the electronic thermostat credit to stand alone regardless of any other cooling system specifics. [EPA-HQ-OAR-2010-0799-9264-A1, pp. 5-6]

Response:

The EPA would like to thank Porsche for their comments. Our responses on high efficiency alternators are discussed in Section II.F.2. of the preamble for this final rule. To summarize, we are not adding high efficiency alternators to the off-cycle credit menu due to the variability in implementation strategy and electrical loads for the systems and related components. This makes it difficult to pinpoint a single, default value for the off-cycle technology menu. Therefore, we feel that high efficiency alternators are better suited for off-cycle credit consideration using the alternate case-by-case approval process for technologies not on the off-cycle technology menu.

As a result, Porsche may seek off-cycle credit for high efficiency alternators but must make an individualized demonstration in order to obtain such credits. Porsche did not submit the underlying data that was used to develop their estimates of benefits for high efficiency alternators in their comments. However, the underlying data that Porsche seemingly has can be used in this process to request the level of credit they proposed.

Organization: Toyota Motor North America

Second, EPA has added a list of off-cycle technologies in §86.1866-12(d)(l) that awards pre-determined credit values to all vehicles and manufacturers employing those technologies. Toyota generally supports the proposed changes to EPA's off-cycle regulations, subject to specific comments below. [EPA-HQ-OAR-2010-0799-9586-A1, p.10]

Off-Cycle Credits: Pre-Determined Credit List [EPA-HQ-OAR-2010-0799-9586-A1, p.11]

EPA has proposed a list of off-cycle technologies with pre-determined levels of credit for each technology on a per vehicle basis. The manufacturer would only need to demonstrate in its application for certification that a technology meets EPA's proposed definition for that technology. However, EPA has proposed to limit the amount of credits that can be earned in a given model year to 10 g/mi on a fleet-wide basis. Further, several technologies require a 10 percent minimum market penetration (combined car and truck production) before credits can be generated.[3] [EPA-HQ-OAR-2010-0799-9586-A1, p.11]

Toyota supports the proposed pre-determined list of off-cycle technologies. The predetermined list provides a level playing field for all manufacturers and uses a conservative per-vehicle credit value and an overall 10 g/mi cap that will protect against concerns of unwarranted credit generation. Toyota also supports expanding the predetermined list to include additional technologies as discussed in more detail in the Alliance comments. [EPA-HQ-OAR-2010-0799-9586-A1, p.11]

3 - Because NHTSA has proposed to accept EPA's approval of off-cycle credits for CAFE, EPA's proposed restrictions also impact credit generation for CAFE purposes. [EPA-HQ-OAR-2010-0799-9586-A1, p.11]

Response:

The EPA appreciates the comments from Toyota for their support of the off-cycle technology menu and the accompanying 10 g/mi cap and 10% market penetration requirements on credits.

The full discussion on comments concerning the 10 g/mi cap and 10% market penetration is provided in section III.C.5.b.i and II.F. of the preamble. Briefly, we are retaining the 10 g/mi cap and finalizing those provisions in this final rule. However, we are finalizing the off-cycle credit program without the 10% threshold requirement due to adverse comments that this requirement would be counterproductive and no favorable comments to the contrary. Accordingly, we are eliminating the 10% sales threshold to qualify for off-cycle credit for the applicable technologies on the off-cycle technology menu.

Finally, regarding Toyota's support for the Alliance comments for expanding the list of technologies on the off-cycle technology menu, our responses to these comments are discussed in Section II.F.2. of the preamble for this final rule.

Organization: United Automobile Workers (UAW)

The UAW applauds EPA for proposing a pre-approved list of off-cycle technologies. [EPA-HQ-OAR-2010-0799-9563-A2, p.3]

Response:

The EPA would like to thank the UAW for their support of the off-cycle technology menu and their continued support for the rule in general. We are finalizing the off-cycle technology menu and believe this will sufficiently address the UAW comments.

Organization: Volkswagen Group of America

Volkswagen is supportive of the agencies proposal for a list of technologies being made available with pre-determined off-cycle credit levels. Based on experience from the European Union, having a manageable procedure offers incentives to include CO_2 reducing technologies earlier and shows real world benefit for consumers. [EPA-HQ-OAR-2010-0799-9569-A1, p. 32]

Volkswagen understands that the intention is for the list of technologies to be a 'living document' and that additional technology may be added over time. Volkswagen further understands that the process for how this list will be updated may be fluid as the industry seeks to add new technologies. We look forward to a transparent process which will be based on testing and technical evidence. Volkswagen supports adding new technologies to the pre-determined credit list once benefits have been established under either of the other two pathways. This will help reduce redundant testing and further streamline this flexibility. [EPA-HQ-OAR-2010-0799-9569-A1, p. 32]

HIGH EFFICIENT LIGHTING

The Volkswagen Group remains an innovator in advanced, power-saving, lighting technology. Audi has been involved in the development of off-cycle credits related to lighting within the European Commission 'Eco-Innovations' regulatory system. Volkswagen offers the following information based on Audi's application regarding EU eco-innovation. [See Table APP-1 on p. 33 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 33]

Although significant focus has been made with regards to LED lights, Volkswagen suggests that several other technologies including Xenon and OLED (Organic LED) will be capable of similar savings. Volkswagen offers the following proposal for the High Efficiency Lighting definition to clarify the baseline from which improvements are measured (building upon the proposal from the Alliance): [EPA-HQ-OAR-2010-0799-9569-A1, p. 33]

'High efficiency exterior lighting means a lighting technology that, when installed on the vehicle, is expected to reduce the total electrical demand of the exterior lighting system when compared to conventional lighting systems employing halogen bulb technology. LED lights specifically qualify. Separate credit values may be earned for high efficiency lighting installed in the following components: parking/position, tail lights, license plate lights, low beam lights, and daytime running lights. Credits may also be earned for a high efficiency lighting bundle that is installed in the following components: front and rear side markers, and backup/reverse lights.' [EPA-HQ-OAR-2010-0799-9569-A1, p. 33]

ENGINE HEAT RECOVERY

Volkswagen proposes that the definition for Engine Heat Recovery be broadened to include applications which may convert recovered energy into cooling. Building upon the definition proposed by the Alliance:

'… converting that heat to electrical, mechanical energy or other thermal energy …' [EPA-HQ-OAR-2010-0799-9569-A1, p. 33]

ACTIVE DRIVETRAIN WARM UP

Volkswagen proposes that the definition be broadened to include indirect drivetrain warm-up such as could be accomplished via secondary water loop.

'.. uses waste heat or waste energy to directly or indirectly warm-up driveline fluids…' [EPA-HQ-OAR-2010-0799-9569-A1, p. 33]

HIGH EFFICIENCY ALTERNATOR

Volkswagen supports the proposal by the Alliance to include High Efficiency Alternators as an off-cycle option. Volkswagen believes that these components have promising potential for CO_2 reductions and will continue to evaluate their potential through technical analysis. [EPA-HQ-OAR-2010-0799-9569-A1, p. 34]

Response:

We appreciate the comments from Volkswagen and their support for the off-cycle technology menu. We provided detailed responses in TSD Chapter 5 on many of the technologies that Volkswagen mentioned in their comments as follows: High Efficiency Exterior Lighting (5.2.3), Waste Heat Recovery (5.2.2; formerly termed "Engine Heat Recovery"), Active Drivetrain Warm-Up (e.g., Active Transmission Warm-Up; 5.2.8.3); and High Efficiency Alternators in Section II.F.2. of the preamble for this final rule. In addition, the technology definitions we are finalizing for specific off-cycle technologies can be found in 5.2.5, 5.2.7., 5.2.8.5, and 5.2.15 of TSD Chapter 5.

In short, we agreed with Volkswagen's comments on expanding the definition for waste heat recovery (formerly engine heat recovery) and active drivetrain warm-up. For high efficiency exterior lighting, we are allowing credits for separate lighting elements as suggested by Volkswagen and others, and expanded the high efficiency exterior lighting definition in a similar, but not exact, fashion to Volkswagen's suggestion. Finally, we agree with Volkswagen that the off-cycle credit program will be "a transparent process which will be based on testing and technical evidence," and over time will consider whether or not technologies should be added to the off-cycle technology menu.

In contrast, we disagree with Volkswagen on the inclusion of high efficiency alternators on the off-cycle technology menu. The variability in implementation strategy and electrical loads for the systems and related components makes it difficult to pinpoint a single, default value for the off-cycle technology menu. Therefore, we feel that high efficiency alternators are better suited for off-cycle credit consideration using the alternate case-by-case approval process for technologies not on the off-cycle technology menu and are not adding this technology to the off-cycle technology menu at this time.

Organization: Volvo Car Corporation (VCC)

VCC strongly supports the pre-defined list. This is a simple effective way to advance innovations and enable manufacturers to take steps that traditionally would not be taken in an early stage of development. The proposed regulation will be a challenge for VCC and for small manufacturers, because new technology is directly linked to high development costs which limit the choice to embark upon an unlimited innovation path. Introducing a new technology, even in small volume, is both costly and risky for manufacturers. If customers do not choose the option in sufficient volumes, the manufacturers will suffer both from the resulting lack of return of investment and a lack of contribution to the fleet's regulatory targets. [EPA-HQ-OAR-2010-0799-9551-A2, p. 6]

• Substantial greenhouse gas improvements can be achieved in off-cycle conditions using new technologies. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

• The off-cycle technology credit menu is a necessary addition to the off-cycle program to avoid administrative delays and burdensome credit application requirements. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

A manufacturer that has completed this extensive testing and is first to complete the approval process will be first out in utilizing the credits once accepted; off-cycle credits should be accessible to applicants without the need to retest the technology. After the technology has been approved for one manufacturer, it should become part of the pre-defined list for other manufacturers to utilize. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

• If a manufacturer applies and is granted off-cycle credits by EPA for a new technology for one model year, this technology should eventually be added to the off-cycle predefined technology list within a reasonable timeframe after the approval giving the introducing manufacturers opportunities to do their initial introduction. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

• Criteria for a proven CO_2-case should be reasonable and kept at a same level for all technologies; enormous testing burdens might be an obstacle which may hinder the development toward positive GHG actions rather than evolving them. [EPA-HQ-OAR-2010-0799-9551-A2, p. 8]

Response:

The EPA would like to thank Volvo for their support of the off-cycle technology menu and agrees with Volvo's comments that it is "is a simple effective way to advance innovations and enable manufacturers to take steps that traditionally would not be taken in an early stage of development."

However, we disagree with the comments from Volvo regarding a technology being added to the list a year after approval is granted. First, the off-cycle technology menu was adopted to add a certain level of stability to the off-cycle credit program. Continually updating the off-cycle technology menu on an annual basis has the complete opposite effect. Further, the menu is part of the rule and can only be amended through notice-and-comment rulemaking proceedings.

Second, the off-cycle technology menu credit values we are finalizing today are based on existing technology and currently available information using conservative estimates. In contrast, the alternate demonstration methods for technologies not on the off-cycle technology menu offers a pathway for manufacturers to demonstrate benefits and request credit beyond the technologies (or the amounts) offered in the off-cycle technology menu. As individual manufacturers develop specific technology that achieves greater benefits (than those listed on the menu), it would be imprudent to reflect this on an annual basis in the off-cycle technology menu since not all vehicles are not expected to have identical technology effectiveness and implementation. Thus, credit values are expected to vary. In this case, the alternate demonstration method process is better suited for case-by-case evaluations where there is insufficient data to support a default credit or where the level of credit may depend on a specific manufacturer's design.

Therefore, we believe a better approach is to address technology improvements that may achieve greater benefits than the default values in the off-cycle technology menu on a case-by-case basis using the alternate demonstration method process until this technology, or associated level of benefit achieved, is common across the industry.

Finally, regarding the comments from Volvo that "If customers do not choose the option in sufficient volumes, the manufacturers will suffer both from the resulting lack of return of investment and a lack of contribution to the fleet's regulatory targets.", we are eliminating the 10% sales threshold to qualify for off-cycle credit for the applicable technologies on the off-cycle technology menu. This should provide Volvo and other manufacturers the necessary flexibility to request credits in the off-cycle credit program.

Organization: American Chemistry Council (ACC)

(5) The final rule should extend the proposed off-cycle credit for thermal control to recognize the benefits of glazing materials with superior insulation performance

In addition to lightweighting, polycarbonate (PC) glazing delivers insulating benefits, which reduce the demand on a vehicle's air conditioning (A/C) system. PC glazing's thermal conductivity is approximately five times lower than glass. In simple terms, PC glazing better insulates the passenger cabin, thereby reducing the load on the air conditioning associated with maintaining a comfortable cabin temperature. The result is an off-cycle benefit analogous to that in the proposed credit calculation for glazing reducing solar transmittance into the cabin. [EPA-HQ-OAR-2010-0799-9517-A2, p. 5]

Certain technologies that reduce A/C demand are not fully captured by current drive test cycles. For this reason, the agencies have proposed off-cycle credits for various technologies that provide this benefit. Unfortunately, the proposed off-cycle credit for glazing does not explicitly recognize the thermal insulation benefits of advanced automotive glazing exemplified by PC. The NPRM discusses the benefits of certain types of glazing, exemplified primarily by infrared (IR) reflective glass, in reducing solar energy transmission into a parked vehicle. In contrast, while PC glazing provides some solar control in relation to the agency's proposed baseline, it generally provides a greater benefit by inhibiting the transfer of heat from warmer outside air into a cooler cabin. As such, insulation benefits accrue in a broader range of scenarios including those where solar radiation is absent or diminished -- for example, at nighttime and on overcast days. [EPA-HQ-OAR-2010-0799-9517-A2, pp. 5-6]

ACC urges the agencies to make clear that the "Glass" or "Glazing" category for these credits includes reduced thermal conductivity, and include within the final rule a calculation to quantify credits related to this effect. The intent of the agencies to address benefits such as thermal conductivity is clear from the administrative record. The Joint Technical Support Document, for example, discusses incentivizing technologies that "reduce the amount of solar energy which enters the vehicle's cabin area, reduce the amount of heat energy build-up within the cabin when the vehicle is parked, and/or reduce the amount of cooling/heating energy required through measures which improve passenger comfort. [EPA-HQ-OAR-2010-0799-9517-A2, p. 6]

While glazing with superior insulation value responds to the agencies' stated intent, the NPRM and associated documents neglect to provide a methodology for quantifying thermal conductivity benefits. Modifying the existing credit to include appropriate references and a calculation to cover RTC benefits is consistent with the scope of the rulemaking and the intent of the agencies in the area of thermal control. As such, ACC believes that the agencies can accomplish this in the present rulemaking, and that a separate petition process is not necessary. [EPA-HQ-OAR-2010-0799-9517-A2, p. 6]

We support and incorporate by reference the detailed written comments separately submitted by a member company of ACC's Plastics Division, SABIC Innovative Plastics, with respect to this issue. We believe the methodology proposed by SABIC is sound and will provide the agencies with a tool to recognize fully the thermal control benefits of advanced glazing. [EPA-HQ-OAR-2010-0799-9517-A2, p. 6]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 267-268.]

The proposed rule contains an option for off-cycle technology credit but, unfortunately, the off-cycle credit in the proposed rule does not recognize the thermal control benefits of polycarbonate in automotive glazing. The formula does recognize the benefits of certain types of glass in controlling solar radiation in parked vehicles, but in contrast, while polycarbonate glazing provides some solar control in relation to engaging this proposed baseline, the benefits accrue in a broader range of scenarios in which the effect of solar radiation is absent or less pronounced. These include nighttime and overcast days as well as those times when the vehicle is in motion. More detailed comments will be presented by other colleagues later today, but we do urge that this will make and consider a parallel credit that fully recognizes thermal control benefits of polycarbonate in glazing applications.

Organization: Bayer MaterialScience

The Final Rule Should Expand the Off-Cycle Credit to Account for Thermal Benefits

Bayer MaterialScience is dedicated to developing innovative high performance materials that will give automakers a choice of materials when it comes to meeting the CAFE requirements. Bayer MaterialScience produces polycarbonate in the United States, thus giving auto manufacturers a domestically-made alternative to glass. The off-cycle credit in the proposed rule fails to take into account the thermal control benefits of polycarbonate glazing. The final rule should take this benefit into account by expanding the off-cycle credit when polycarbonate glazing is used. Polycarbonate would help automakers to meet CAFE requirements and reduce greenhouse gases by providing increased insulation benefits, contributing to net weight reduction of the vehicle, offering more aerodynamic styling options to the manufacturer (and thus increasing fuel efficiency) and lowering CO_2 emissions over the lifecycle of polycarbonate. As a result, for purposes of the current rulemaking, Bayer MaterialScience feels it is appropriate to include the additional methodology for calculating thermal conductivity benefits within the Final Rule, and that a separate petition process for this rule is not needed. [EPA-HQ-OAR-2010-0799-9198-A2, pp. 1-2]

Using polycarbonate as a glazing material will contribute to lower thermal conductivity. This benefit of polycarbonate will contribute to better energy efficiency in all vehicle types. Thus, we reiterate our support for an expansion of the off-cycle credit to account for this benefit or the addition of a new corresponding credit. [EPA-HQ-OAR-2010-0799-9198-A2, p. 2]

Polycarbonate Glazing has Additional Benefits for Automakers and the Environment

For years automotive manufacturers have used polycarbonates and polycarbonates composites in the manufacture of their vehicles. Polycarbonate glazing allows for integration of parts that was previously not possible (exhibit 1). [See exhibit 1 in Docket number EPA-HQ-OAR-2010-0799-9198-A2, p. 5.] This can contribute to vehicles being lighter in weight without compromising the structural integrity of the vehicle. For example, it is now possible to manufacture a clear view roof module and window pane or rear side window and window pane using a two-shot injection molding process. This injection molding process also allows the manufacturer to functionally integrate brackets, ribs and attachment points into the backlight assembly. And, of course, polycarbonate can be used for better insulation benefits, which can reduce demand on the vehicle's battery and HVAC units, thereby reducing greenhouse gases. [EPA-HQ-OAR-2010-0799-9198-A2, p. 2]

Polycarbonate has an extensive history of serial applications in the automotive glazing industry. In fact, the first commercial application was in 1998 with a rear quarter window on the Smart ForTwo vehicle. The number of applications has steadily grown through the years as automakers have seen the many benefits that polycarbonate can provide. These applications now include rear side windows, sun roof systems, panoramic roof systems and transparent rear body parts. I have included two slides with the handouts that show the progression of applications since 1998 (exhibit 2). [See exhibit 2 in Docket number EPA-HQ-OAR-2010-0799-9198-A2, pp. 6-7.] Polycarbonate is also recognized as a suitable glazing material by authorities around the world, including the United Nations Economic Commission for Europe. [EPA-HQ-OAR-2010-0799-9198-A2, p. 2]

Bayer MaterialScience has developed innovative and sustainable material solutions using polycarbonate and polycarbonate composites for glazing applications. These materials enable weight reductions of up to 50 percent compared to glass, as already demonstrated by the use of polycarbonate in panoramic roofs and fixed side windows already in commercial production (BayerNews, October 7, 2011). The density of polycarbonate is less than half the density of glass (1200 Kg/m3 for polycarbonate vs. 2500 Kg/m3 for glass) and contributes to the weight reduction of up to 50 percent versus glass. This weight reduction contributes to CO_2 emissions being cut by up to 728 pounds per vehicle over a vehicle's service life of 95,000 miles compared to cases where glass is used. [EPA-HQ-OAR-2010-0799-9198-A2, p. 3]

With polycarbonate enabling weight reductions of up to 50 percent compared to glass, automakers can achieve better fuel efficiency and greater stability by lowering the vehicle's center of gravity. Use of polycarbonate in a panoramic roof, for example, can help to significantly lower the vehicle's center of gravity and improve handling (exhibit 4). [See exhibit 4 in Docket number EPA-HQ-OAR-2010-0799-9198-A2, pp. 24-32.] [EPA-HQ-OAR-2010-0799-9198-A2, p. 3]

Bayer MaterialScience has developed transparent tinted colors specifically for polycarbonate glazing that filter out a large proportion of the sun's infrared (IR) rays. As a result, the vehicle interior does not heat up as much under the effects of sunshine. Appropriately treated glazing made of IR grade polycarbonate enables IR light and energy transmission values for dark colors that are at least as low as commercial thermal insulation pigments for glass. Polycarbonate glazing also offers benefits in terms of thermal insulation thanks to the plastic's thermal conductivity, which is roughly five times lower than that of glass. In cold weather conditions, this increases the temperature of the internal surfaces of the polycarbonate glazing inside the vehicle significantly, which in turn cuts the energy needed to heat the vehicle and also improves comfort. This feature, too, can help boost the travel range of electric vehicles. [EPA-HQ-OAR-2010-0799-9198-A2, p. 3]

The wide choice of styling options with polycarbonate is testing conventional assumptions of automotive window design and creating whole new opportunities for advanced vehicle styling. This design flexibility of windows can contribute to better aerodynamics for vehicle manufacturers, which of course leads to lighter weight vehicles and better fuel economy. The ability to add colors to glazing parts, along with sharp corners, smooth corner radii and complex three dimensional shapes are among the many other benefits associated with these styling options by using polycarbonate. [EPA-HQ-OAR-2010-0799-9198-A2, p. 3]

Polycarbonate Glazing Reduces Life-Cycle Greenhouse Gas Emissions Compared to Glass

An independent study from a renowned Europe-based company indicates that when studying polycarbonate vs. glass over the life of the product, which would be from initial production to usage of the product to the waste phase, polycarbonate can help to substantially lower CO_2 emissions (Exhibit 3). [See exhibit 3 in Docket number EPA-HQ-OAR-2010-0799-9198-A2, pp. 8-23.] 1 KG (2.2046 lbs.) of polycarbonate saves 14-22 KG (30.85-48.50 lbs.) of CO_2 emission over the lifecycle of the material. If all of a car's windows with the exception of the windshield were made of polycarbonate (a total of 33 pounds of the plastic), the lower fuel consumption could cut CO_2 emissions by up to 728 pounds per vehicle over a vehicle's service life of 95,000 miles compared to cases where glass is used. [EPA-HQ-OAR-2010-0799-9198-A2, p. 4]

Polycarbonate Glazing Enhances Vehicle Safety

You don't need to start smashing windows to know that polycarbonate has a significant impact strength advantage over glass. With polycarbonate's superior impact resistance it can contribute to safety by improving passenger retention in the event of a crash. [EPA-HQ-OAR-2010-0799-9198-A2, p. 4]

In closing, we would like to express our support for the expansion of the off-cycle credit to account for the thermal control benefits that polycarbonate glazing can provide for automotive manufacturers looking to contribute to the reduction of harmful greenhouse gases. The benefits of a material like polycarbonate, such as weight reduction, reduced CO_2 emissions and safety improvements, would give automotive manufacturers a valuable alternative to consider when trying to achieve these valuable CAFE requirements. [EPA-HQ-OAR-2010-0799-9198-A2, p. 4]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 271-274.]

Organization: California Air Resources Board (CARB)

During the public comment period on the notice of proposed rulemaking for the '2017 and Later Model Year Light-Duty Vehicle, Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards,' U.S. EPA received numerous comments on the proposed off-cycle credits for advanced solar load reduction technologies. Unfortunately, several of these comments contained inaccuracies with regard to the California Air Resources Board's (CARB or Board) prior work on 'the 2009 proposed Cool Gars regulation. I welcome this opportunity to make you aware of these inaccuracies and set the record straight. [EPA-HQ-OAR-2010-0799-11799-A2, p.1]

The primary inaccuracy was that CARB ceased work on the Cool Cars regulation due to the belief that the metallic glazing used to comply with the rule interferes with radio signals, thus jeopardizing public safety. While these concerns were brought to the attention of CARB, they were not the basis of the decision to cease-work on the regulation. In fact, the decision to cease work stemmed from a June 2009 Board hearing during which the Board directed staff to revise the proposed regulation and subsequently return with a proposal for a performance-based option, which, would have increased the stringency of the rule while also providing greater flexibility in achieving the greenhouse gas (GHG) benefits. It was this increase in stringency that could have resulted in greater use of metallic glazing, which spurred concerns of public safety advocates. Due to the inability to achieve consensus on the best path forward during the timeframe required, staff ceased work on the regulation. Instead, it was determined that the direction of the Board would be best implemented by folding the objectives of Cool Cars into the Advanced Clean Cars regulation. [EPA-HQ-OAR-2010-0799-11799-A2, pp.1-2]

As you know, staff from ARB and U.S. EPA worked together to craft the off-cycle credit option for solar control and thermal load. reduction technologies. Contrary to the comments received, this credit option provides increased flexibility to manufacturers to achieve their fleet GHG targets. The solar control off-cycle credits are not proscriptive in any way and manufacturers may use any glazing technology on the market in order to receive credits, as long as the performance of the glazing is better than baseline glass. To date, there are multiple technology options available to manufacturers, including solar absorbing (non-metallic) and solar reflective (both metallic and nonmetallic) glazing. In addition, there is at least one company with a new non-metallic, non-radio interfering reflective product in development that is expected to be in production by 2014. Ultimately, a manufacturer may choose not to use solar control glazing and achieve their GHG targets through any other means, including mass reduction or improved aerodynamics, both of which can be aided by the use of polycarbonate glazing. [EPA-HQ-OAR-2010-0799-11799-A2, p.2]

It is important to note that many manufacturers are already using some level of solar control product on their vehicles today. These products are safe, and testing conducted by ARB indicated that there were no statistically significant effects pf metallic reflective glazing on the operation of GPS ankle bracelets or cell phone operation in an urban environment. Although there may be adverse effects of metallic glazing on cell phone connectivity in a rural environment, which was not tested by ARB, it is worth repeating that metallic glazing is used today on many vehicles in the United States and Europe, both as a manufacturer-installed option and as an aftermarket film, without any known public safety impacts. [EPA-HQ-OAR-2010-0799-11799-A2,p.2]

The reason that solar control products are widely used is because of their ability to improve occupant comfort and, by extension, reduce GHG emissions and fuel use due to reduced loads on the air conditioning system. The analysis conducted by ARB for Cool Cars, and subsequently applied by both U.S. EPA and ARB to determine the off cycle credit calculations, demonstrates a benefit of solar control glazing of up to three grams per mile for a passenger car. Contrary to the comments received by U.S. EPA suggesting that this methodology is 'flawed,' the benefit calculations were based on several peer-reviewed reports and refined through consultation with industry experts. [EPA-HQ-OAR-2010-0799-11799-A2, p.2]

We therefore maintain that the three gram per mile benefit for passenger cars is an accurate, and likely conservative estimate of the true benefit of solar control glazing. [EPA-HQ-OAR-2010-0799-11799-A2, p.3]

In closing, I urge U.S. EPA to retain the structure of the off-cycle credits for solar control technologies. Doing so will properly credit the benefits of a wide range of solar load reduction products, while still providing manufacturers 'with the flexibility to use any available engine or vehicle technology to achieve their fleet GHG targets. It will also appropriately reward the early adopters of advanced solar control materials and continue to spur innovation in the glazing industry. [EPA-HQ-OAR-2010-0799-11799-A2, p.3]

Organization: California Manufacturers & Technology Association (CMTA)

CMTA understands that the joint USEPA-National Highway Transportation and Safety Administration (NHTSA) notice of proposed rulemaking for fuel economy and greenhouse gas emission regulations for model year 2017-2025 light-duty vehicles, dated December 1, 2011, includes options under which auto manufacturers may obtain “off-cycle” greenhouse gas emission reduction credits. In 2010, we were involved in a similar proposal put forth by the California Air Resources Board (CARB) which CARB eventually dropped. The savings in fuel was exceptionally small (under 4-1/2 gallons year for the average vehicle) for the amount of possible complications that would have occurred. [EPA-HQ-OAR-2010-0799-9536-A2, p.1]

While the CARB regulation would have mandated the use of a reflective glazing material in car windshields and windows, it would have had a significant negative impact on radio frequency transmissions of cell telephones, garage door openers, global positioning system (GPS) equipment, toll tag transponders (Fast Track), emergency equipments signals (police, fire, ambulance), and even parolee ankle bracelets. While we understand that the decision to choose a particular technology to obtain an off-cycle credit will be voluntary, it is reasonable to assume that auto manufacturers seeking to maximize credits under the proposed rule would be inclined toward use of metallicized reflective materials in the glass. [EPA-HQ-OAR-2010-0799-9536-A2, pp.1-2]

In addition, this approach will benefit reflective glass technologies, but fails to recognize other technologies which can achieve similar results. For example, off-cycle reduction in air conditioning load can also be achieved through use of polycarbonate glazing technologies that reduce thermal conductivity, helping to maintain a more comfortable interior temperature. Such technologies should also be accommodated in the final federal rule so that vehicle manufacturers have greater flexibility in meeting the stringent emission limits contemplated in the draft regulation. [EPA-HQ-OAR-2010-0799-9536-A2, p.2]

For the above reasons, we believe these incentives need to be more thoroughly evaluated. [EPA-HQ-OAR-2010-0799-9536-A2, p.2]

Organization: California State Sheriffs' Association (CSSA), California Police Chiefs Association (CPCA), California Narcotic Officers' Association (CNOA)

On behalf of the California State Sheriffs' Association (CSSA), California Narcotic Officers' Association (CNOA) and the California Police Chiefs Association (CPCA), we write to express our concern regarding the joint United States Environmental Protection Agency (USEPA) and National Highway Traffic Safety Administration (NHTSA) proposed rule making for fuel economy and greenhouse gas (GHG) emissions for model year 2017-2025 light-duty vehicles of December 1, 2011. [EPA-HQ-OAR-2010-0799-9488-A1, p. 1]

While we support the intended goals of establishing certain GHG emission reduction credits and appreciate that this federal proposal takes a voluntary approach relative to ARB's Cool Cars proposal, we remain concerned that the proposal will incentivize the use of metallic reflective window technology. There are a number of implications that this regulation will have on GPS technology for ankle bracelets used to monitor offenders and the ability of law enforcement, parole agents, and probation officers to monitor and track offenders accurately as well as Enhanced 9-1-1. [EPA-HQ-OAR-2010-0799-9488-A1, pp. 1-2]

Over the last year California has made significant changes to the delivery of criminal justice services to address its prison overcrowding crisis. This has led the state to take measures to reduce the prison population, one of which is to place more offenders on GPS or electronic monitoring. The use of metallic reflective window technology presents the potential for unintended, and very adverse, consequences associated with RF device interference. ARB's own analysis illustrated a doubling of dropped GPS signals under varying circumstances. Even a slight drop or deviance in connectivity and the ability to locate an offender as a result of metallic glazing is problematic and concerning, especially in light of the availability of alternative solutions that achieve energy savings while not presenting the same public safety impacts. [EPA-HQ-OAR-2010-0799-9488-A1, p. 2]

In addition to concerns relative to GPS monitoring, we are concerned that use of metallic reflective window technologies can increase the likelihood of interference with reliable operation of cell phones and Enhanced 9-1-1 capabilities for PSAP's. This concern is magnified in emergency situations where a caller may need to place an emergency 9-1-1 call and where signal strength may already be lessened such as in rural areas. Further, in may impact the ability of PSAPs to locate a caller via Enhanced 9-1-1. [EPA-HQ-OAR-2010-0799-9488-A1, p. 2]

We appreciate the opportunity to comment on this regulation and for your consideration of our comments. We would be remiss if we did not share these concerns with you and the implications of this regulation on public safety. For reasons stated, we ask that you consider reworking the current proposal and specifically removing the off-cycle credit that incentivizes the use of metallic reflective window technology. [EPA-HQ-OAR-2010-0799-9488-A1, p. 2]

Organization: Crime Victims United of California (CVUC)

On behalf of Crime Victims United, of California(CVUC),I am writing to convey serious concerns regarding the joint United States Environmental Protection Agency (USEPA) and National Highway Traffic Safety Administration (NHTSA) proposed rulemaking for fuel economy and greenhouse gas (GHG) emissions for model year 2017-2025 light-duty vehicles of December 1, 2011. [EPA-HQ-OAR-2010-0799-9883-A1, p. 1]

CVUC is a nonprofit organization that uses education, legislative advocacy and political action to enhance public safety, promote effective crime-reduction measures and strengthen the rights of crime victims. [EPA-HQ-OAR-2010-0799-9883-A1, p. 1]

As you may be aware, California is facing a prison overcrowding crisis. Such crisis has led the state to take measures to reduce the prison population, one of which is to place more offenders on GPS or electronic monitoring. CVUC understands local law enforcement's need for alternative custody options and has been generally supportive of providing these alternative options; however, our position on the use of this technology is dramatically altered in light of the potential consequences of this joint regulatory proposal. [EPA-HQ-OAR-2010-0799-9883-A1, p. 1]

As you may know, in 2010 California's Air Resources Board (ARB) proposed a regulation known as 'Cool Cars' that would have effectively mandated the use of metallic reflective window technology. CVUC adamantly opposed this proposal due to the serious implications for RF signal interference and the associated potential for public safety consequences. As a result of CVUC and other stakeholders' concerns, California's ARB ultimately abandoned the Cool Cars regulation in recognition of the fact theft the emission reduction benefit calculations were based on flawed methodology and that use of this technology presented the potential for unintended adverse consequences associated with RF device interference. Despite this history, EPA and NHTSA appear to be using the same methodology in this proposed regulation for establishing certain GHG emission reduction credits. While we understand that this joint federal proposal takes a voluntary approach relative to ARB's Cool Cars proposal, we remain concerned that it will incentivize use of metallic reflective window technology, giving rise to the same RF interference and public safety concerns at issue under the Cool Cars proposal. [EPA-HQ-OAR-2010-0799-9883-A1, pp. 1-2]

ARB's own analysis illustrated a doubling of dropped GPS signals under varying circumstances. While this is significant, it is also important to note that the testing was done in an urban area where signal strength was very strong. What about in areas where signal strength is not strong (i.e. rural areas where our prison facilities are located or foothill/mountain communities where signals are lost in canyons)? [EPA-HQ-OAR-2010-0799-9883-A1, p. 2]

Given the difficulty in adequately monitoring the prison, jail and parolee population in California as it is, CVUC feels strongly that the approach under the federal regulation should be reworked to address the potential problems for the state in monitoring its GPS population. In these grave times of prison overcrowding, the early release of inmates, and more, such an approach to global warming is unacceptable and has crime victims in California highly concerned. In our discussions with other stakeholders and the ARB in 2010, we came to learn that there are other options to achieve GHG emission reductions that do not have to compromise signal strength that could ultimately impact the ability to monitor offenders' activities through GPS. [EPA-HQ-OAR-2010-0799-9883-A1, p. 2]

In addition to concerns relative to GPS monitoring, we are concerned that use of metallic reflective window technologies as contemplated in the joint rulemaking - even under limited circumstances -can increase the likelihood of interference with reliable operation of cell phones. This would be particularly problematic in troubling emergency situations where a motorist might need to place an emergency 911 call - especially in rural locations where signal strength may already be lessened. [EPA-HQ-OAR-2010-0799-9883-A1, p. 2]

While increased fuel efficiency and lower greenhouse gas emissions are both laudable goals, under the proposed rule these goals could be achieved at the expense of significant potential adverse impacts on the ability of consumers, emergency workers and law enforcement personnel to contact help in an emergency, communicate life-saving instructions, and track prisoners released under electronic surveillance. [EPA-HQ-OAR-2010-0799-9883-A1, p. 2]

For these reasons, we ask EPA and NHTSA to consider reworking the current proposal and specifically removing the off-cycle credit that effectively incentivizes use of metallic reflective window technology. [EPA-HQ-OAR-2010-0799-9883-A1, p. 2]

Organization: CTIA - The Wireless Association

On behalf of CTIA-The Wireless Association®, the international trade association representing wireless carriers, equipment manufacturers, and Internet service providers, I write to express the wireless industry's concerns regarding potential regulations which would reward "off-cycle" GHG credits for the use of a single type of technology for window glazing. [EPA-HQ-OAR-2010-0799-11759-A2, p.1]

The current draft of the regulations would create incentives for the use of metallic films for glazing in automobiles. Metallic films can interfere with electronic devices that depend on radio frequency (RF) transmissions, such as cellular telephones, GPS systems, and other devices. [EPA-HQ-OAR-2010-0799-11759-A2, p.1]

While we support lowering greenhouse gas emissions and increasing fuel efficiency, that should not be done at the risk of interfering with wireless devices, which are frequently used to communicate during emergencies and to provide location assistance for drivers. [EPA-HQ-OAR-2010-0799-11759-A2, p.1]

There are other glazing technologies that offer similar emission reduction benefits without compromising the performance of wireless devices or other technologies that rely on RF transmissions. One example is polycarbonate glazing which can help reduce air conditioning load through superior insulating properties. [EPA-HQ-OAR-2010-0799-11759-A2, p.1]

We ask EPA and NHTSA to consider alternatives that do not encourage solar reflective glazing only. We would ask you to consider credits for other types of glazing technologies that are less obstructive to wireless devices. [EPA-HQ-OAR-2010-0799-11759-A2, p.1]

Organization: Enhanced Protective Glass Automotive Association (EPGAA)

Member companies of the EPGAA provide glazing products to the automotive market. These products include solar control glazing, which include technologies that reduce the solar heat load in a vehicle. The reduction of the solar heat load results in lower air conditioning load, which in turn results in lower fuel consumed and reduced greenhouse gas emissions. Since the cabin comfort requirements are indifferent to the powertrain technology, the solar glazing impact is just as valid on Internal Combustion Engine vehicles as it is on Hybrid-Electric or fully electric vehicles. Since the glazing technology is a passive technology for the consumer, in that it does not require any consumer interface, the benefits to the consumer and to the environment are independent of consumer behavior. Finally, the solar control glazing technologies are designed to meet or exceed the safety, security, health, and other benefits of glass that are either required by regulations or expected by the customers. [EPA-HQ-OAR-2010-0799-9301-A1, p. 1]

EPGAA supports the proposed rule for the off-cycle credits for technologies whose impact on fuel consumption and emissions cannot be measured in the test cycles. The calculation proposed by the EPA on the off-cycle credit for solar glazing provides a simplified model for defining the impact of glazing on the heat load reduction and the emissions. EPGAA supports the general concept but recommend that the following changes be considered: [EPA-HQ-OAR-2010-0799-9301-A1, p. 1]

1. There should be a method to account for the total glass surface in a vehicle. The credit calculation as defined in the NPRM treats all vehicles in a class as being similar in the amount of heat load coming through the glass. There has been a trend in the market to have larger size glass, which would lead to higher heat load and therefore higher emissions. Therefore, we recommend that there be an accounting for the total glass surface. A simple multiplier could be applied. See below for an example:

Base line glass surface = 4 sq.m.

Actual glass surface = 4.4 sq.m.

Therefore, total impact = 4.4/4.0 = 1.1 times the baseline impact. Thus the total impact of glazing on the emissions would be 110% of the baseline vehicle. [EPA-HQ-OAR-2010-0799-9301-A1, p. 2]

2. The impact captured by the formula as defined in the NPRM was based on several studies of internal combustion engine vehicles in drive cycles and modeling studies that the EPGAA supports. However, the introduction of technologies such as start/stop, hybrid, electric, etc. would provide additional benefits from the use of solar glazing. Additionally, the formula does not capture the benefits of solar glazing during the times when the cabin temperature in the vehicle may only increase marginally above setpoint due to heat load. In such instances, the use of heat load reduction technologies may completely eliminate the need for air conditioning by keeping the cabin temperature below setpoint. These benefits have not been captured in the formula and EPGAA recommends that further analysis be done to quantify these benefits and include them in the regulation at the time of the mid-term evaluation. [EPA-HQ-OAR-2010-0799-9301-A1, p. 2]

3. The NPRM puts a maximum limit on the credit from thermal control technologies at 3 g/mi for passenger automobiles and 4.3 g/mi for light trucks. The credit for glazing is also limited to 3.0 g/mi for passenger automobiles and to 4.3 g/mi for light trucks. Since the data used for the calculations has been based on currently known technologies, it would be difficult to predict the actual savings from the solar glazing in the higher efficiency vehicles. EPGAA recommends that the impact of solar glazing on (higher efficiency) vehicles should not be capped. EPGAA believes that regulation should promote innovation and is concerned that such a cap could potentially stifle innovation in solar glazing rather than promote continued advancement of the technology. [EPA-HQ-OAR-2010-0799-9301-A1, p. 2]

5. EPGAA supports the use of the off-cycle credits as provided in these regulations and urges the Agency to adopt them in the final rule. EPGAA also recommends that these regulations be adopted for the MY 2012-2016 without the formal review process as currently required. Allowing these credits earlier would encourage the use of the technologies that provide the benefits sooner. [EPA-HQ-OAR-2010-0799-9301-A1, p. 3]

In conclusion, the EPGAA supports the agencies in considering the off-cycle technologies and specifically the solar glazing technologies. [EPA-HQ-OAR-2010-0799-9301-A1, p. 3]

Organization: Garmin International Inc.

The first area of concern is that the proposed rule would reward (with Thermal Control 'off-cycle' GHG credits) only the automobile manufacturers who select a single type of technology for window glazing. This is a fundamentally flawed approach because it limits choices, thereby stifling innovation and artificially raising prices due to lessened competition. [EPA-HQ-OAR-2010-0799-9508-A1, p.1]

Since 2009, it has been commonly accepted that metallicized reflective glazing that reflects the solar rays also attenuates radio frequency (RF) signals. This reflection of RF signals is one of the factors that caused California to reject this technology. The lack of flexibility in window materials technology that vehicle manufacturers are given by the NPRM--to achieve GHG credits--will negatively affect consumers, emergency responders, RF-signal-dependent device manufacturers (GPS ankle bracelets and transponders for parolees, mobile phones, GPS devices, toll tags, to name a few) and their service providers. [EPA-HQ-OAR-2010-0799-9508-A1, p. 2]

The proposed rule also provides a disincentive for any manufacturer to utilize off-cycle design technologies that are very beneficial in terms of air emissions and exceed (together or separately) the 109/mi. threshold imposed by (d)(1) of the 'CO_2 fleet average credit and incentive programs' section. We view the threshold as a defacto limit on the investments you will see in off-cycle environmental technologies, because some beneficial technologies may not be able to be adequately demonstrated using the EPA 5-cycle methodology described by section (d)(2), and there is no guarantee the manufacturer will receive the required permission from the EPA, per section (d)(3) to perform a technology demonstration using an alternative EPA-approved methodology. In addition, the technology demonstrations per (d)(2) and (d)(3) must be performed, documented, submitted to, and approved by, the EPA. To follow this regimen for several models in the fleet would be prohibitive in terms of time, resources, cost and uncertainty. For manufacturers who wish to move forward quickly to improve the CO_2 emissions of their fleet, we ask that you provide ways to validate a CO_2 credit for a technology being adopted in many models without having to go through the (d)(2) or (d)(3) demonstration process for every model. [EPA-HQ-OAR-2010-0799-9508-A1, pp.2-3]

Strategic development plans and roadmaps for numerous models in the fleet can hardly withstand this degree of uncertainty over the lengthy research and development cycles that precede the rollout of a car or light truck model. This disincentive that the rule has constructed may reduce the investment in breakthrough CO_2-reducing technologies that would otherwise be deployed in the US automobile market. This brings to light the importance of NHTSA and USEPA (1) working with industry to frequently test, validate and add other CO_2-reducing technologies to the off-cycle technology table, and giving serious consideration to removing the 109/mi. threshold. We are not in favor of limiting the credits manufacturers' rightly receive for innovative, environmentally responsible design features. [EPA-HQ-OAR-2010-0799-9508-A1, p.3]

Research has shown that metallicized reflective glazing will cause significant adverse effects on the reception and transmission of E911, mobile phone and GPS navigation signals. Two years ago, Garmin and a broad coalition of interested parties field-tested the impact of the 'Cool Cars' regulations that were being promoted by the California Air Resources Board (CARB) under AB 32 (the Global Climate Change regulations). At that time, CARB was pursuing a vehicle glass requirement which would have required a layer of metallic reflective material in the windshield to reflect solar rays. CARB had similar goals as described in the U.S. EPA NPRM, but forcing car and light truck manufacturers to use this type of glazing could have been very counterproductive. If 10% of drivers quit using GPS because of signal interruptions caused by metallicized reflective glazing, the increased GHG emissions from these vehicles more than cancels out all GHG reduction benefits of metallicized glazing. Put another way, for every theoretical 1 ton decrease of GHG emissions from metallicized glazing, vehicles send 2 extra tons of GHG emissions into the atmosphere. [EPA-HQ-OAR-2010-0799-9508-A1, p. 3]

We see no reason why lower-weight and lower-cost alternative solutions such as non-metallic polycarbonate materials are not listed as options in the NPRM. An advanced insulating or solar absorbent technology with solar transmittance (Tts) properties of 54% is equally as effective as metallic reflective (50% Tts with 10% deletion windows) in blocking the sun's rays from the auto interior and has none of the negative shortcomings as far as attenuating signals. We respectfully ask EPA and NHTSA to include an off-cycle credit that recognizes the relative benefit of insulating glazing for reducing GHG emissions without harming systems such as E911. [EPA-HQ-OAR-2010-0799-9508-A1, p. 3]

We would be happy to share the results of the coalition's testing and discuss this matter with you in greater detail. Our nation's cellular networks and global positioning system are national assets in which US taxpayers have invested billions. These systems support our economic growth, as well as our personal and public safety. [EPA-HQ-OAR-2010-0799-9508-A1, p. 3]

Garmin's second area of concern is that the proposed rule does not give vehicle manufacturers the opportunity to generate a defined minimum off-cycle credit for some verifiable real-world fuel saving and CO_2-reducing technologies. These would include in-dash GPS navigation and in-dash GPS navigation with traffic avoidance. We respectfully ask that the current literature and research be thoroughly explored and reviewed with the goal of facilitating the generation of CO_2 credits for these additional technologies in some standardized way. We would be happy to discuss this with you. [EPA-HQ-OAR-2010-0799-9508-A1, p. 3]

In order to assist manufacturers in meeting their 2025 targets ahead of schedule, Garmin believes these companies should have no regulatory disincentives to fully utilize every kind of smart driving CO_2-reducing technology that they are willing to invest in. [EPA-HQ-OAR-2010-0799-9508-A1, p.3]

We look forward to working with you towards getting credits placed on the off-cycle technology menu for in-dash GPS navigation technologies. [EPA-HQ-OAR-2010-0799-9508-A1, p.3]

Organization: Guardian Automotive Products, Inc.

Guardian commends NHTSA and EPA for recognizing through off cycle credits a variety of technologies which can significantly improve fuel economy and emissions, yet were previously excluded due to the short falls of the current vehicle test cycles. [EPA-HQ-OAR-2010-0799-9299-A1, p. 1]

Thermal Control and Glazing

Guardian recommends that the formula for solar glazing credits be adjusted to include a factor that accounts for the overall surface area of glazing in the vehicle. The proposed formula accounts for the incremental area contribution of each glazing aperture with respect to the total, but ultimately provides the same potential credit for a vehicle with a small glazing area and no sunroof as it does for a vehicle with a large glazing area and large sunroof. [EPA-HQ-OAR-2010-0799-9299-A1, pp. 1-2]

While the 2012-2016 GHG regulation permits an OEM to apply for glazing or heat load reduction credit, the glazing credit formula in the 2017 and later regulation should improve and simplify this process and be made available for OEMs to use immediately. [EPA-HQ-OAR-2010-0799-9299-A1, p. 2]

Solar Roof Panels

Guardian applauds NHTSA's and EPA's recognition of the potential benefits photovoltaics can offer, especially as the popularity of hybrids and EV's grows. [EPA-HQ-OAR-2010-0799-9299-A1, p. 3]

This technology is rapidly evolving to the point that the 50 Watt threshold required in the proposed regulation is likely to be significantly surpassed by the time the regulation takes effect in 2017. In fact, there are examples today which already significantly surpass this value. For instance, the Fisker Karma today employs a photovoltaic roof panel which produces in excess of 100 Watts at standard conditions. As a result, Guardian urges NHTSA and EPA to adopt a formula based credit for this technology in order to fully recognize future benefits and to encourage the development and use of higher power systems. Presuming that the same logic the agencies used to arrive at the credit listed for the 50 Watt threshold holds for higher power, is this first equation simply a linear relationship based on this value? Guardian acknowledges that while it is fairly simple to determine output of any PV panel at any given conditions of direct normal solar irradiance combined with angle and temperature, it is not so evident today to predict exactly what total benefit will be achievable based on average vehicle use and driving as well as parking conditions. We suggest for this reason that at this time a simple equation for credit is appropriate, and as systems increase in popularity there will be more data available to refine the credit, perhaps at the mid term review. However, given the long timeframe of the proposed regulation and the pace of innovation in the photovoltaic industry, it seems imperative that such a credit not be simply a fixed value if the true objective is to incentivize further advancement in output, and hence potential reduction in GHG emissions and fuel consumption. [EPA-HQ-OAR-2010-0799-9299-A1, p. 3]

As the primary goal of the regulation is to generate significant improvements to emissions and fuel economy (and the associated economic and societal benefits), Guardian also urges that the credit for solar roof panels be made available prior to 2017. [EPA-HQ-OAR-2010-0799-9299-A1, p. 3]

Moreover, as a clarification point, Guardian recommends that the proposed credit be allowed for any solar panel with appropriate output and not be limited to roof mounted panels, as suggested by the term 'solar roof panel'. [EPA-HQ-OAR-2010-0799-9299-A1, p. 4]

Guardian also requests that the test conditions to establish panel power with respect to the proposed rule be defined as part of the rule. For instance, in the photovoltaic industry it is common to provide output values at STC (Standard Test Conditions) which are most commonly a direct normal solar irradiance of 1000 W/m2 and a panel temperature of 25°C± 2°C. [EPA-HQ-OAR-2010-0799-9299-A1, p. 4]

Conclusion

In summary, Guardian applauds the efforts of EPA and NHTSA with respect to the treatment of off cycle credits in the proposed regulation. These credits will encourage innovation and technological advancements as well as corresponding improvements in fuel economy and emissions. We hope the agencies find the above comments useful and relevant, and will draw upon them to further improve the regulation and drive incentives to maximize benefits offered by such technologies. [EPA-HQ-OAR-2010-0799-9299-A1, p. 4]

Organization: Pittsburgh Glass Works (PGW)

Pittsburgh Glass Works (PGW) supports the proposed rule's provisions for providing credit for off-cycle technologies. The benefits of solar glazing, for example, are not measured in any current test cycle, but have been proven to reduce emissions and improve fuel efficiency. Solar glazing has been proven to reduce interior cabin temperatures by as much as 10 deg C and thus reduce the work load of the air conditioning system. Solar glazing technologies provide additional benefits to the consumer, such as improved noise reduction, UV protection, better security, etc. beside the emissions reduction. [EPA-HQ-OAR-2010-0799-9300-A1, p. 1]

PGW would like to provide the following suggestions for the agencies' consideration:

1. The off-cycle credit for glazing is calculated using a formula that correlates the benefit to the glass properties. PGW supports the general concept of the formula used, but would like to offer a recommendation to improve the methodology to enable a more accurate accounting of the contribution of solar glazing. The formula, as defined in the NPRM, calculates the temperature reduction from the glass where the contribution of each piece of glass is measured as a percentage of the total glass area. However, there is no accounting for the fact that the total glass area in the vehicle is in itself a very large contributor to the heat load in a vehicle. There is a general trend of increasing glass size in the vehicles, and the larger amount of glass would actually contribute a larger proportion of heat load that would be affected by the kind of glazing. Therefore, it is PGW's recommendation that the agencies introduce a factor that accounts for the total glass area in the vehicle. For example, if the average glass surface in a car is 4.0 sq.m., then if the glass usage is greater than 4.0 sq.m. the contribution of the solar glazing should be proportionately larger. Therefore, the revised equation would be as follows: [EPA-HQ-OAR-2010-0799-9300-A1, p. 2]

Baseline glass size = 4.0 sq.m.

Actual glass used = 5.0 sq.m.

Contribution of glass in actual vehicle = 5.0/4.0 = 125% of baseline glass. [EPA-HQ-OAR-2010-0799-9300-A1, p. 2]

2. The off-cycle credit for thermal load reduction technologies is capped at 3.0 g/mile for cars and 4.3 g/mile for light-duty trucks. The credit for glazing technologies is also subject to the same limitations. The data to support the benefits of the glazing technologies and heat load reduction technologies has been gathered from analysis of current technologies. There are likely to be innovations in the technologies before and during the time frame of the regulations that might surpass the performance of existing technologies. Therefore, applying the limits to the benefits could inhibit innovation. PGW urges the agencies to remove these maximum limits so that technology innovation is encouraged. [EPA-HQ-OAR-2010-0799-9300-A1, p. 2]

4. The data used for the credit calculation has been based on testing and modeling of existing technologies primarily on internal combustion engine vehicles. The benefit of the solar glazing technologies would be compounded with other technologies such as start/stop, hybrid, electric, etc. Therefore, PGW recommends that the agencies continue to consider the full benefit of the solar glazing technologies and refine the model at the mid-term review of the regulations. [EPA-HQ-OAR-2010-0799-9300-A1, p. 3]

5. Finally, PGW strongly urges that the credit be made available in the MY2012-2016 regulations without the burdensome review process as currently stipulated. This will enable earlier implementation of the technologies and the benefits could be accrued much sooner. [EPA-HQ-OAR-2010-0799-9300-A1, p. 3]

PGW support the agencies' consideration of off-cycle credits in general, and the impact of solar glazing in particular. If there is any further information that can be provided, please do not hesitate to contact us. [EPA-HQ-OAR-2010-0799-9300-A1, p. 3]

Organization: SABIC Innovative Plastics US LLC

These comments focus on the proposed off-cycle and fuel consumption improvement credits for Thermal Control Technologies. Specifically, SABIC-IP requests that the agencies make clear that the "Glass or Glazing" category for these credits includes reduced thermal conductivity benefits ("RTC" benefits or credits) as well as reduced solar transmittance benefits ("RTts" benefits or credits), and further that the agencies include within the regulatory text a calculation to quantify credits associated with the RTC benefits. A modification of the proposed credit to encompass thermal conductivity benefits is within the scope of the NRPM, and can therefore be accomplished during the next stage of this rulemaking. As such, a separate petition process to achieve this result is not necessary. The Alliance of Automobile Manufacturers, the American Chemistry Council, Bayer MaterialScience and the Society of the Plastics Industry support this request. [EPA-HQ-OAR-2010-0799-9467-A1, pp.1-2]

Modifying the existing credit to recognize the additional benefits of other glass or glazing technologies generally, and RTC glazing specifically, is consistent with the intent to promote advanced energy management within the passenger compartment, or cabin, to reduce air conditioning (A/C) loads. Accounting for the RTC benefits also promotes continued innovation in glazing technologies. Finally, placing RTC-based technologies on an even footing with RTts-based technologies ensures that all glass and glazing technologies will be treated similarly within the regulatory program and will remain available in the marketplace. [EPA-HQ-OAR-2010-0799-9467-A1, p.2]

In addition to a calculation to quantify RTC benefits, SABIC-IP presents test data measuring the fuel economy benefits of lightweight materials and confirming the traditional estimates that vehicle weight reductions of 10% result in approximately 6-7% better fuel economy. Finally, SABIC-IP presents information regarding how additional GHG emissions and fuel economy benefits from improved aerodynamics and other factors can result from the integration of engineering thermoplastics into the front six inches and most of the rear six inches of a light duty motor vehicle. [EPA-HQ-OAR-2010-0799-9467-A1, p.2]

In sum, engineering thermoplastics offer three-fold emissions and fuel economy benefits: (1) polycarbonate glazing reduces air conditioning load by substantially reducing window thermal conductivity relative to traditional glass; (2) engineering thermoplastics offer significant mass reduction opportunities throughout the vehicle; and (3) engineering thermoplastics offer aerodynamic design opportunities that further reduce GHG emissions and fuel consumption. [EPA-HQ-OAR-2010-0799-9467-A1, p.2]

The agencies propose off-cycle GHG and fuel consumption improvement credits for advanced glass or glazing technology and specify a calculation to quantify this benefit based on the ability to reduce the amount of solar energy entering the passenger cabin of the vehicle, relative to a baseline glazing.1 This technology decreases the “total solar transmittance,” or “Tts”, of the glazing and, as a result, lowers the “soak” temperature in the cabin of a “standing” vehicle under hot sunny conditions.2 By lowering soak temperature, reduced Tts glass or glazing reduces the subsequent demand on the A/C system to cool the cabin air to a comfortable temperature. [EPA-HQ-OAR-2010-0799-9467-A1, p.3]

SABIC-IP endorses off-cycle credits for reduced Tts glass or glazing as long as the regulatory structure remains technology neutral and does not advantage a particular glazing technology.3 SABIC-IP therefore requests that the agencies also include a calculation to quantify reduced thermal conductivity credits for glazing that provides similar GHG reduction benefits. These benefits are independent of those resulting from reductions in Tts. Moreover, RTts and RTC benefits can coexist not only within the same vehicle but also within the same window application when both Tts and thermal conductivity are reduced below the respective baselines for solar transmittance and thermal conductivity. [EPA-HQ-OAR-2010-0799-9467-A1, p.3]

To support this request, SABIC-IP sets forth below a detailed methodology to account for and quantify the RTC benefits associated with advanced glass or glazing. This methodology tracks the methodology in the proposed rule for quantifying RTts benefits, adopting the same standards and analytical steps applied by the agencies for the RTts credit. The result is an off-cycle credit formulation for RTC benefits analogous to that in the proposed rule for RTts benefits. [EPA-HQ-OAR-2010-0799-9467-A1, p.3]

Reducing window thermal conductivity inhibits heat transfer between the ambient air outside the vehicle and the passenger cabin. Thus, the amount of heat transfer into the cabin is reduced. This reduction in heat transfer can be identified with a reduction in A/C load, 4 which in turn yields a reduction of the A/C related GHG emissions associated with maintenance of a comfortable cabin temperature. PC glazing can provide this benefit because it offers an inherent thermal conductivity five times lower than glass, thereby offering a significantly greater insulating capacity. [EPA-HQ-OAR-2010-0799-9467-A1, p.4]

The purpose of the proposed off-cycle credits for Thermal Control Technologies5 is to encourage innovations that “reduce the amount of solar energy which enters the vehicle’s cabin area, reduce the amount of heat energy build-up within the cabin when the vehicle is parked, and/or reduce the amount of cooling/heating energy required through measures which improve passenger comfort.” [EPA-HQ-OAR-2010-0799-9467-A1, p.4]

Throughout the process of developing the proposal, EPA and NHTSA sought industry guidance regarding a broad category of thermal control technologies. At the outset, the agencies met with OEMs to assess major technology areas, including “thermal management technologies.” The proposed list of Thermal Control Technologies is indicative of this approach and includes a varied list of features that rely on many distinct technological innovations to achieve GHG and fuel economy benefits. [EPA-HQ-OAR-2010-0799-9467-A1, p.4]

The proposed regulatory text furthers this intent by referring to the off-cycle credits for Thermal Control Technologies as applicable to “Glass or Glazing,” and this reference is repeated in the TSD. [EPA-HQ-OAR-2010-0799-9467-A1, pp.4-5]

However, when setting forth the calculation to quantify the credits, the agencies refer only to a single glazing attribute, Tts, and do not include thermal conductivity values. Consequently, although RTC benefits fall squarely within the stated intent and the scope of the credits as expressed in the proposal, the regulation fails to encompass the full range of benefits and credits associated with Glass or Glazing Thermal Control Technologies. Extending the existing credit to include appropriate references and a calculation to cover RTC benefits is clearly within the scope of the proposed rule and a logical extension of the proposed regulatory text. As a result, for purposes of the current rulemaking, SABIC-IP believes it is appropriate to include the additional methodology for calculating thermal conductivity benefits within the final rule, and that a separate petition process is not necessary. [EPA-HQ-OAR-2010-0799-9467-A1, p.5]

The comparison in the following table of the mechanisms underlying the RTts and RTC benefits illustrates why both should be included on the off-cycle credit menu. The RTts benefit recognizes the role of solar energy transmission in generating high soak temperatures in parked unoccupied vehicles. RTC glazing insulates the passenger cabin from the effects of higher outside air temperatures and reduces the demand on the A/C system to maintain a comfortable cabin temperature. Both technologies inhibit energy transfers that tend to increase the cabin temperature. Both technologies reduce the amount of fuel required by operation of the A/C system, during cool down from the soak state in one case and while maintaining a comfortable cabin temperature in the other. The two technologies through different mechanisms provide similar benefits in terms of A/C related fuel use and GHG emissions. [EPA-HQ-OAR-2010-0799-9467-A1, p.5] [For the associated table please refer to EPA-HQ-OAR-2010-0799-9467-A1, p.6]

Significantly, RTC glazing does not appreciably influence soak temperature or negatively offset the GHG and CAFE benefits estimated for RTts glazing. Thus, because RTC and RTts operate through independent, but not mutually exclusive mechanisms, the benefits from RTts glazing and RTC glazing are independent and entirely additive. [EPA-HQ-OAR-2010-0799-9467-A1, p.6]

The agencies’ proposed methodology for RTts-based credits may be applied simultaneously with the methodology for the RTC-based credits presented below. The methodology for quantifying RTC credits is closely modeled after the approach in the proposed rule for quantifying the RTts credits. [EPA-HQ-OAR-2010-0799-9467-A1, p.6]

Quantifying the Benefits of Reduced Tts and Reduced Thermal Conductivity [EPA-HQ-OAR-2010-0799-9467-A1, p.6]

The RTts credit methodology in the proposal provides a common structure for quantifying the GHG reduction benefits of both reduced solar transmission and reduced thermal conductivity. [EPA-HQ-OAR-2010-0799-9467-A1, p.6]

The proposed RTts credit calculations rely on National Renewable Energy Laboratory (NREL) studies that evaluated technologies to reduce soak temperature for climate control purposes. Based on NREL's finding that reduced Tts glazing decreases the cabin temperature gain when a car is left parked in the sun, the proposal calculates GHG reductions based on window Tts values relative to location-specific window baseline values. The agencies have proposed an off-cycle credit opportunity for glazing of up to 2.9 g/mi for passenger vehicles and 3.9 g/mi for light trucks to recognize this benefit.12 [EPA-HQ-OAR-2010-0799-9467-A1, pp.6-7]

Vehicles equipped with both RTts glazing and RTC glazing would be entitled to separate and cumulative off-cycle credits for each technology, as long as their combined cumulative credit is no more than 2.9 g/mi for cars and 3.9 g/mi for trucks. [EPA-HQ-OAR-2010-0799-9467-A1, p.7]

Summary of the Proposed Calculation for Reduced Tts [EPA-HQ-OAR-2010-0799-9467-A1, p.7]

The existing glass or glazing credit uses Tts as the measurable attribute to quantify the GHG reduction and off-cycle credit amount. This arises from the theory that limiting the amount of solar energy transmitted into the passenger cabin during a solar soak will decrease the amount of fuel required to subsequently cool the cabin. Tts describes the percentage of the incoming solar energy transmitted through the automobile glazing. [EPA-HQ-OAR-2010-0799-9467-A1, p.7]

The first step in the proposed RTts-based calculation is to quantify the connection between Tts reductions and the reduction in cabin temperature during a standing car's prolonged sun exposure (i.e. the "soak" temperature). Working from NREL data that pairs Tts values with soak temperature reductions, the draft Joint TSD assumes a linear correlation to find a relationship between Tts and temperature reduction. The equation developed in this step can be used to calculate an expected temperature reduction from window Tts values. [EPA-HQ-OAR-2010-0799-9467-A1, p.7]

The draft Joint TSD uses a weighted average to combine individual window contributions into a temperature reduction average for the entire vehicle.13 This accounts for differences in area and Tts values across windows. The proposed methodology, as set forth in the draft Joint TSD and the regulatory text, uses each window's Tts value to calculate an individual window contribution to temperature reduction via the relationship between Tts and cabin soak temperature. The draft Joint TSD assumes that each window's contribution to the reduction in soak temperature is proportional to its area independent of window orientation. [EPA-HQ-OAR-2010-0799-9467-A1, pp.7-8]

The second analytical step of the proposed Tts analysis quantifies the connection between reduced cabin temperature and reduced A/C related fuel use. The draft Joint TSD quotes NREL's published result, based on simulation data, that a 12 degree centigrade reduction in cabin soak temperature results in a 26% reduction in A/C fuel consumption. This corresponds to a 2.2% reduction in A/C fuel consumption for every 1 degree centigrade reduction in the soak temperature.14 [EPA-HQ-OAR-2010-0799-9467-A1, p.8]

The third and final step connects the decrease in A/C fuel use, expressed in terms of the Tts glazing attribute, to a GHG reduction. Working from agency assumptions about the CO_2 impact of A/C systems (13.8 g/mi for cars and 17.2 g/mi for trucks), the draft Joint TSD calculates a CO_2 reduction of 0.3 g/mi (cars) and 0.4 g/mi (trucks) for each degree centigrade reduction in air cabin temperature. [EPA-HQ-OAR-2010-0799-9467-A1, p.8]

The proposed Tts methodology allows the agencies to calculate a vehicle GHG reduction based on a set of vehicle window areas and Tts values. Below, we present a methodology using the same analytical steps to calculate GHG reductions from the thermal conductivity and thickness of a reduced thermal conductivity glazing. [EPA-HQ-OAR-2010-0799-9467-A1, p.8]

Calculating the CO_2 Benefits of Reduced Thermal Conductivity [EPA-HQ-OAR-2010-0799-9467-A1, p.8]

SABIC-IP proposes a calculation to quantify the benefits of RTC glazing that is similar to the calculations included in the proposal for RTts glazing. The RTC approach set forth below is analytically premised on two peer-reviewed SAE papers demonstrating how PC glazing, with its lower thermal conductivity as compared to glass, reduces the A/C load required to maintain cabin temperature and the lack of any adverse practical impact on the cabin soak temperature when PC glazing is used. The RTC credit analysis parallels the proposal's methodology for the RTts credits.17 [EPA-HQ-OAR-2010-0799-9467-A1, p.8]

After we describe the measurable glazing attribute that underlies the RTC off-cycle glass or glazing benefit (here, thermal conductivity normalized to window thickness rather than Tts), the RTC credit calculation proceeds in three steps: (1) quantification of the cabin response as a function of the measured window attribute (for the RTts credit, the agencies related soak temperature reduction to Tts reduction; here, we relate a reduction in the heat transfer into a cabin to a reduction in window thermal conductivity normalized to window thickness); (2) relating the cabin response to a reduction in A/C fuel use; and (3) relating the reduction in A/C fuel use to GHG emission reduction. The net result is a set of equations that match the RTts credit's form and methodology, but which relate the GHG emission reduction to a reduction in window thermal conductivity rather than to a reduction in Tts.18 The full calculation is described in identical steps and in more detail in the attached Annex A. [EPA-HQ-OAR-2010-0799-9467-A1, p.9]

RTC glazing's GHG benefits are derived from a lower thermal conductivity (relative to glass) that inhibits heat transfer between the vehicle cabin and the outside air. In the governing physical relationships, the glazing thermal conductivity (k) appears with glazing thickness (d) as a reciprocal factor (k/d). For example, at a given window location, insulation performance can be enhanced by lowering thermal conductivity and/or increasing window thickness. Accordingly, to calculate the off-cycle credit for a car with RTC technology, the thermal conductivity normalized to window thickness (k/d) is selected as the glazing attribute. This parallels the adoption of Tts as the measurable vehicle attribute for the RTts credit calculation. Though thermal conductivity is intrinsic to a given material, the typical window thickness generally varies from location to location and across different car models.19 [EPA-HQ-OAR-2010-0799-9467-A1, p.9]

Step 1: Express the Cabin Response (a change in heat transfer) In Terms of the Attribute [EPA-HQ-OAR-2010-0799-9467-A1, p.10]

As in the RTts case, the proposed methodology is based on a linear relationship between the cabin response and a change in window attribute. Thus, the cabin response to RTC glazing, namely the reduction in steady state heat transfer (in Watts), is related to the change in window thermal conductivity normalized to window thickness (k/d). The area-weighting used in the RTts credit calculation to account for variations in window size is also used here to account for similar variations as well as the selective application of PC glazing to the rooflite and backlite positions in the prototype case. This case, studied in the underlying SAE papers, nevertheless provides the basis for a general result applicable to other glazing configurations. [EPA-HQ-OAR-2010-0799-9467-A1, p.10]

Data from the relevant SAE paper is used to calculate the relationship between (k/d) and the heat transfer into the cabin. This data can be found within Annex A as well as in the table below. [EPA-HQ-OAR-2010-0799-9467-A1, p.10] [For the table please refer to EPA-HQ-OAR-2010-0799-9467-A1, p.10]

The above table summarizes glazing parameters for two comparison vehicles. The baseline vehicle has standard glass windows at all positions and provides the baseline values for calculating the RTC credit. The other vehicle has PC glazing at the backlite and rooflite positions and glass windows at all remaining positions. Thermal conductivity (k), thickness (d), and (k/d) are listed for each vehicle's window position. "Change" represents the difference in (k/d) values for each window where glass glazing is replaced with PC glazing. Since there is no change in the windshield or side window from the baseline vehicle, the corresponding "change" value for those positions is zero. [EPA-HQ-OAR-2010-0799-9467-A1, p.10]

Applying parameters presented above and following the reduced Tts approach to account for individual window contributions, the area-weighted change in thermal conductivity normalized to thickness is 118.6 W/m2-K. Again following the SAE paper's results which show a heat transfer reduction of 107 Watts for the window configuration in the above table, and adopting the same linear relationship assumed for the reduced Tts credit, implies a response constant of 0.9021. Therefore, the following equation quantifies the heat transfer reduction (cabin response) due to a change in (k/d):[EPA-HQ-OAR-2010-0799-9467-A1, pp.10-11] [For the equation please refer to EPA-HQ-OAR-2010-0799-9467-A1, p.11]

The external temperature and solar radiation data used to generate this result incorporate a range meant to reflect real-world variations. The data represent mid-day August conditions in Phoenix, Arizona averaged over all Augusts from 1991-2005. As such, the data are not limited to a single sky condition but represent clear sunny days as well as the actual range of cloud cover configurations. [EPA-HQ-OAR-2010-0799-9467-A1, p.11]

Step 2: Use the Cabin Response to Calculate the Resulting Reduction in A/C Fuel Use [EPA-HQ-OAR-2010-0799-9467-A1, p.11]

For vehicles with RTC glazing technology installed at the backlite and rooflite window positions and with cabin air recirculating so that the A/C load reduction can be identified with the reduction of heat transfer through the glazing, the SAE study demonstrated a decrease in the steady state air conditioning load of 107 Watts, or 6.4%. This allows us to use the equation developed in Step 1 to calculate individual window contributions to a reduced A/C load. [EPA-HQ-OAR-2010-0799-9467-A1, p.11]

A/C load reduction can be related to A/C fuel use reduction by following the NREL methodology used for the reduced Tts credit. The RTts credits derived in the proposal rely on two separate NREL computer simulations that model, respectively, how a decrease in soak temperature reduces the A/C load for subsequent cool down and how, in turn, a decrease in A/C load reduces fuel consumption. A/C load was simulated to show a decrease of 29.8% for a 12 degree centigrade reduction in soak temperature (the latter generated in part by differences from the baseline vehicle other than the glazing). Fuel use was simulated to show a 26% decrease for this reduction in A/C load. [EPA-HQ-OAR-2010-0799-9467-A1, p.11]

Adapting these two NREL simulation results (i.e. using the ratio of 26% to 29.8%) to calculate fuel reductions attributable to RTC shows a 5.6% percent decrease in fuel use for a 107 Watt decrease in air conditioning load. 21 This corresponds to a 0.052% A/C fuel use reduction for each Watt reduction in the air conditioning load. [EPA-HQ-OAR-2010-0799-9467-A1, p.11]

Step 3: Relate Fuel Use Reductions to CO_2 Reductions [EPA-HQ-OAR-2010-0799-9467-A1, p.12]

In order to arrive at a final credit amount, the RTC reduction in A/C fuel use must be related to a reduction in GHG emissions expressed in grams of CO_2 per mile. The proposed calculation for a reduced Tts Solar Control credit does this by multiplying the area-weighted average of individual window contributions (Step 1) by a conversion factor Z. This conversion factor can be calculated by using the relationship between A/C load reduction and fuel use found in Step 2 (a 0.052% decrease in A/C/ fuel use for each Watt reduction in A/C load). [EPA-HQ-OAR-2010-0799-9467-A1, p.12]

Applying the same air conditioning CO_2 emissions data used in the agencies' RTts-based credit calculation (13.8 g/mi for cars and 17.2 g/mi for trucks), Z values applicable to RTC are derived: 0.0072 (g/mi)/Watt for cars and 0.0090 (g/mi)/Watt for trucks. [EPA-HQ-OAR-2010-0799-9467-A1, p.12]

Example: RTC-Based Credit Calculation for a Car with PC Glazing [EPA-HQ-OAR-2010-0799-9467-A1, p.12]

Again working from the above table of glazing parameters, this example calculates a representative off-cycle credit for a car22 where half of the glass window area is replaced with PC. We chose a value of 220 as a reasonable midpoint between the change values for thermal conductivity divided by window thickness in the table above. Since we have chosen an example where one-half of the vehicle windows remain unchanged, this introduces a factor of one-half via the area-weighted average. Thus, the calculated RTC credit for a car with half of the glass window area replaced by PC is: [EPA-HQ-OAR-2010-0799-9467-A1, p.12] [For the equation please refer to EPA-HQ-OAR-2010-0799-9467-A1, p.12]

This calculated value falls within the range of proposed values on the off-cycle credit menu. It is greater than the 0.4 g/mi proposed for solar reflective paint, another Thermal Control Technology credit, and close to the proposed credit for active aerodynamics (0.6 g/mi), a credit on the general Off-Cycle Technology menu. [EPA-HQ-OAR-2010-0799-9467-A1, p.12]

Summary [EPA-HQ-OAR-2010-0799-9467-A1, p.12]

Linking the above steps leads to an RTC off-cycle credit that is consistent with the RTts credit. It uses similar factors in the same methodology to calculate an off-cycle credit for RTC glazing. Following from the structure and placement of the RTts credit, we propose that the summary below be added to the Code of Federal Regulations at 40 C.F.R. 86.1866-12(d)(1)(i)(D) to calculate an off-cycle credit (CTC) for RTC glazing as follows: [EPA-HQ-OAR-2010-0799-9467-A1, p.12] [For the associated figure please refer to EPA-HQ-OAR-2010-0799-9467-A1, p.13]

Where ZTC = 0.0072 for passenger automobiles and 0.0090 for light trucks; Gi = the measured area of window i, in square meters and rounded to the nearest tenth; G = the total window area of the vehicle in square meters and rounded to the nearest tenth; Qi = the steady state load reduction for window i, determined by using the following formula: [EPA-HQ-OAR-2010-0799-9467-A1, p.13] [For the associated figure please refer to EPA-HQ-OAR-2010-0799-9467-A1, p.13]

Where (k/d)new,i, = the thermal conductivity of window i normalized to thickness d; (k/d)base,i = the thermal conductivity for a standard glass window in i’s position normalized to thickness (k/d)base,i = 312 for the backlite location, 260 for the rooflite location, and 200 for the windshield, side-front, side-rear, and rear quarter locations. [EPA-HQ-OAR-2010-0799-9467-A1, p.13] [For the associated figure please refer to EPA-HQ-OAR-2010-0799-9467-A1, p.13]

The methodology proposed here for RTC credits closely tracks the methodology proposed in the regulation for calculating RTts credits. Adding a calculation applicable to reduced thermal conductivity benefits expands the off-cycle credit menu in a way that furthers the express intent of the credit program to capture the full range of Thermal Control Technologies, including Glass or Glazing able to achieve and/or maintain comfortable cabin temperatures with reduced load on the A/C system. SABIC-IP believes it is appropriate to include the additional methodology for calculating thermal conductivity benefits within the final rule, and that a separate petition process to accomplish this is not necessary. [EPA-HQ-OAR-2010-0799-9467-A1, p.13]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 283-286.]

1 - We use the term “off-cycle” credit as a general reference encompassing the “off-cycle” credits provided in EPA’s greenhouse gas program as well as the corollary “fuel consumption improvement” credits in the CAFE program. See, e.g., 76 Fed. Reg. 75,021. [EPA-HQ-OAR-2010-0799-9467-A1, p.3]

2 - A “standing” vehicle for this purpose is one promoting the maximum soak temperature for a given glazing type: the A/C off, the windows closed, no ventilation and no shading. The term “standing” is used throughout these comments with the same meaning. [EPA-HQ-OAR-2010-0799-9467-A1, p.3]

3 - When regulating products, “the overriding principle of fairness is always the same: the government must govern with an even hand.” U.S. v. Undetermined Quantities of an Article of Drug Labeled as Exachol, 716 F. Supp. 787, 795 (S.D.N.Y. 1989) (holding that the FDA applied an “uneven regulatory policy” by not treating one product like similar situated other product). It is well-established that an agency cannot treat similarly situated parties differently without a reasoned basis for doing so. See, e.g., Burlington Northern and Santa Fe Ry. Co. v. Surface Transp. Bd., 403 F.3d 771, 776-777 (D.C. Cir. 2005) (“Where an agency applies different standards to similarly situated entities and fails to support this disparate treatment with a reasoned explanation and substantial evidence in the record, its action is arbitrary and capricious and cannot be upheld.”). [EPA-HQ-OAR-2010-0799-9467-A1, p.3]

4 - For a vehicle equipped with PC glazing technology rather than traditional glass in the backlite and rooflite windows, research has demonstrated a 107 Watt or 6.4% reduction in the A/C load required to maintain a comfortable cabin temperature for particular solar and temperature conditions and with air recirculating. See Reduced Steady State Heating and Air Conditioning Loads via Reduced Glazing Thermal Conductivity, SAE Technical Paper 2011-01-0126, 2011. Although the benefits of air recirculation and RTC are synergistic, the latter is an independent incremental benefit over and above the benefit of recirculation previously recognized by the agencies. [EPA-HQ-OAR-2010-0799-9467-A1, p.4]

5 - The Proposed Rule and supporting documents inconsistently categorize some of the proposed off-cycle credits as both Thermal and Solar Control technologies. For example, when the category is introduced within the draft Joint Technical Support Document (TSD), it is proposed as “Thermal (and Solar) Control Technologies.” p.5-69 (Section 5.2.3.5). This categorization is consistently applied through that Section. However, the draft Joint TSD later abandons reference to the Thermal Control Technologies when it summarizes the proposed off-cycle credits, referring only to Solar Control. See draft Joint TSD at 5-74 (table 5-26). Because Solar Control fails to accurately characterize all of the technologies listed in the Thermal Control category, the terminology should be revised in the final Joint TSD. This would also align it with the proposed regulatory language at 76 Fed. Reg. 75,381-2 where Thermal Control is used. [EPA-HQ-OAR-2010-0799-9467-A1, p.4]

12 - The proposed regulatory language for 40 C.F.R. § 86.1866-12(d)(1)(i)(B) appears to mistakenly set the "glass or glazing" credit caps at 3.0 g/mi for passenger automobiles and 4.3 g/mi for light trucks. See 76 Fed. Reg. 75,382. Conflicting "Glass or glazing" caps of 2.9 g/mi (cars) and 3.9 g/mi (trucks) are indicated in the Thermal Control Technology Table on the same page of the Federal Register and within the draft Joint TSD. See Draft Joint TSD at 5-73 (Table 5-25). This seems to arise from an accidental substitution of the categorical Thermal Control Technology caps for the specific glass or glazing limit. [EPA-HQ-OAR-2010-0799-9467-A1, p.7]

13 - Although the draft Joint TSD does not explicitly use area weighting until a later step of its analysis, we summarize it here to parallel the RTC calculation discussion. Area-weighting serves to preserve the analogy between RTts, where 100% of the glazing area is modified in the prototype case from which the off-cycle credit is derived, and RTC, where only 50% of the glazing area is modified in the prototype case. The resulting analogous expressions for the incremental cabin response to a change in attribute at one window (subject to area weighting) are labeled as the "General Case" in the attached Annex A. [EPA-HQ-OAR-2010-0799-9467-A1, p.7]

14 - The origin of this result and its reliance on computer simulations is explained in more detail below when the RTC-based credit calculation is presented. [EPA-HQ-OAR-2010-0799-9467-A1, p.8]

17 - The agencies have not specified any particular approach to calculating off-cycle or fuel consumption improvement benefits, and recognize that the demonstration of such benefits may involve "on-road testing, modeling, or some other analytic approach," Instead, the agencies require that, regardless of approach, the demonstration must be "robust, verifiable, and capable of demonstrating the real-world emissions benefit of the technology with strong statistical significance." 76 Fed. Reg. 75,021; Draft Joint TSD at 5-56 (Section 5.2) ("The estimates of these credits were largely determined from research, analysis and simulations, rather than from full vehicle testing, which would have been cost and time prohibitive.") To that end, we propose a method of demonstrating the real world benefits associated with the thermal control properties of PC glazing that tracks the methodology proposed with regard to Tts technology. As noted above, the PC glazing approach is also supported by published peer-reviewed SAE papers. In addition, the proposed methodology employs the applicable assumptions in the 2007 NREL paper cited frequently in the proposal and the TSD. See Reduction in Vehicle Temperatures and Fuel Use from Cabin Ventilation, Solar-Reflective Paint, and New Solar-Reflective Glazing, SAE Technical Paper 2007-01-1194. [EPA-HQ-OAR-2010-0799-9467-A1, pp.8-9]

18 - The agencies have recognized in the context of the proposed Tts methodology that an analytic approach is necessary to calculate the benefits for thermal and solar technologies. The same is true for RTC glazing. The SC03 test cycle does not capture PC glazing's benefits which are most pronounced when the A/C is maintaining a cabin air temperature much cooler than the outside air and the A/C is allowed to run for long periods. The SC03 cycle in the 5-cycle test, though it imposes an outside air temperature 12.8 C higher than the cabin temperature automatically targeted by the A/C, has a much smaller average temperature difference over the test duration because the cycle, only 10 minutes long, immediately follows a soak phase. This is

too short to attain and simulate the steady state cabin conditions (common in the real world) where RTC glazing's benefits are most pronounced. Instead, the SC03 cycle simulates cabin cool down from a solar soak state where RTC glazing provides practically no net effect. An analytic methodology is therefore appropriate. [EPA-HQ-OAR-2010-0799-9467-A1, p.9]

19 - An example of how these variations are treated in practice can be seen in the PC glazing credit calculation below. [EPA-HQ-OAR-2010-0799-9467-A1, p.9]

21 - See Annex A for a complete description of how the NREL results are applied to calculate the RTC fuel use reduction. [EPA-HQ-OAR-2010-0799-9467-A1, p.11]

22 - See id. for a calculation of a representative truck RTC credit value. [EPA-HQ-OAR-2010-0799-9467-A1, p.12]

Organization: Society of the Plastics Industry, Inc. (SPI)

We respectfully request modification of the proposed off-cycle credit addressing thermal control technology to specifically recognize the insulation benefits of innovative glazing technologies such as polycarbonate (PC) glazing, in order to employ a technology neutral approach. This can be achieved by clarifying that the "glass or glazing" category includes both reduced thermal conductivity benefits (for which a calculation for corresponding credits should be included within the regulatory text) and reduced solar transmittance benefits. [EPA-HQ-OAR-2010-0799-9492-A1, p.2]

The Agencies Should Clarify that Glazing with Reduced Thermal Conductivity is Eligible for the Proposed Off-Cycle Credit (OCC) for Thermal Control, and Include a Methodology for Quantifying This Benefit [EPA-HQ-OAR-2010-0799-9492-A1, p.6]

SPI supports the inclusion of an off-cycle credit (OCC) for thermal control. As the agencies are aware, the performance of technologies that reduce air conditioning demand are not captured on test drive cycles, and are therefore appropriate for recognition under the OCC program. As proposed, the credit appears focused on solar control technologies.[29] This phenomenon would be relevant to some PC glazing products, including those that filters a proportion of infrared rays. However, we note that the proposed glazing credit formulation is inadequate to capture other qualities of advanced glazing that reduce A/C load and associated emissions. [EPA-HQ-OAR-2010-0799-9492-A1, p.6-7]

In particular, SPI respectfully requests consideration for modification of the proposed off-cycle credit for thermal control to employ a technology neutral approach, and include the full range of glazing with reduced thermal control properties. With a thermal conductivity approximately five times lower than glass, PC glazing helps to maintain a comfortable temperature with less air conditioning use. The substantial off-cycle reduction on the air conditioning (A/C) load is expected to result in improved energy efficiency regardless of vehicle type or power train. [EPA-HQ-OAR-2010-0799-9492-A1, p.7]

The administrative record makes clear the agencies' intent to encourage innovations that: "reduce the amount of solar energy which enters the vehicle's cabin area, reduce the amount of heat energy build-up within the cabin when the vehicle is parked, and/or reduce the amount of cooling/heating energy required through measures which improve passenger comfort." [EPA-HQ-OAR-2010-0799-9492-A1, p.7]

This intent is also reflected in the regulatory text and the Technical Support Document, both of which refer to thermal control technologies applicable to "glass or glazing." While glazing with superior insulation value clearly responds to the agencies' stated intent, the NPRM and associated documents neglect to provide a methodology for quantifying thermal conductivity benefits. Modifying the existing credit to include appropriate references and a calculation to cover reduced thermal conductivity benefits is consistent with the scope and intent of the agencies in the area of thermal control. As such, SPI believes that providing such a methodology can be accomplished in the present rulemaking, and that a separate petition process is not necessary. [EPA-HQ-OAR-2010-0799-9492-A1, p.7]

SPI understands that comments to be submitted by SABIC Innovative Plastics will provide details for quantifying the off-cycle benefits from reduced thermal conductivity, and we urge the agencies carefully consider modifying the OCC to incorporate such a calculation. An amended credit is appropriate in assuring vehicle manufacturers are provided with appropriate flexibility to meet standards. Recognition in an OCC of thermal benefits and other technologies would be consistent with agencies' planned mid-term evaluation, and would not favor a particular material or technology over another. [EPA-HQ-OAR-2010-0799-9492-A1, p.7]

SPI again expresses its appreciation for the opportunity to comment, in support for the inclusion of thermal control benefits in an off-cycle credit for automotive manufacturers. [EPA-HQ-OAR-2010-0799-9492-A1, p.8]

---

29 - The equation at 76 FR 75382 includes Tts for total solar transmittance

Organization: TechAmerica

We would like to bring to your attention a concern we have identified in the proposal as it relates to the available options through which auto manufacturers may obtain "off-cycle" greenhouse gas emission reduction credits. One of the options included in the proposed rule involves window glazing technologies to reduce heat buildup in parked cars, which can reduce fuel consumption associated with air conditioning use. [EPA-HQ-OAR-2010-0799-9470-A1, p.1]

To the best of our knowledge, the most effective of these technologies is glass treated with metallicized reflective materials. While we understand that the decision to choose a particular technology to obtain an off-cycle credit will be voluntary, it is reasonable to assume that auto manufacturers seeking to maximize credits under the proposed rule would be inclined toward use of the metallicized reflective materials in glass. [EPA-HQ-OAR-2010-0799-9470-A1, p.1]

This incentive is of great concern because metallic films are known to interfere with electronic devices that depend on radio frequency (RF) transmissions, such as global positioning systems, toll tag transponders and cellular telephones. Even limited use of metallicized reflective technology (e.g. only in windshields) can increase the likelihood of interference with reliable operation of these devices. The potential for cell phone interference or dropped calls is especially troubling in emergency situations. [EPA-HQ-OAR-2010-0799-9470-A1, p.1]

While increased fuel efficiency and lower greenhouse gas emissions are both laudable goals, under the proposed rule these goals would be achieved at the expense of significant adverse impacts on the ability of consumers, emergency workers and law enforcement personnel to contact help in an emergency, communicate life-saving instructions, determine the most direct route to a destination, and track prisoners released under electronic surveillance. For these reasons, we ask EPA and NHTSA to consider removing the off-cycle credit that effectively incentivizes metallicized reflective glazing. [EPA-HQ-OAR-2010-0799-9470-A1, p.2]

We also request that the EPA and NHTSA consider the impact of adding metallic film on the cost of recycling mass produced windows. With this proposal’s implementation, the EPA and NHTSA would need to consider providing recyclers a list of benign metals (similar to the SNAP list) that manufacturers can use as a reference for materials that do not need to be recovered. [EPA-HQ-OAR-2010-0799-9470-A1, p.2]

There are also safety considerations that go beyond the interference with RF transmission due to the metallic glazing of driver’s windows. This concern is evident in some local laws in North America such as in British Columbia that requires that no film is permitted on the driver’s compartment right or left. Such legislation indicates a tint of any kind may be considered a means to increase the risk of an accident. [EPA-HQ-OAR-2010-0799-9470-A1, p.2]

As an industry, we have dealt with this issue most recently at the state level in California. In March of 2010, the California Air Resources Board (CARB) abandoned a regulatory proposal to mandate use of this technology in recognition of the fact that the emission reduction benefit calculations were based on flawed methodology and that use of this technology presented the potential for unintended adverse consequences associated with RF device interference. The California Legislature subsequently passed SB 1328 (Lowenthal, 2010), which requires CARB to consider the following factors when adopting or amending regulations to reduce motor vehicle cabin temperature in order to reduce greenhouse gas emissions: [EPA-HQ-OAR-2010-0799-9470-A1, p.2]

(a) Potential reductions in air-conditioning use that can be achieved while a motor vehicle is moving, in addition to reductions in air-conditioning use when a motor vehicle is parked. [EPA-HQ-OAR-2010-0799-9470-A1, p.2]

(b) Potential conflicts between, and relative benefits of, motor vehicle cabin temperature reduction requirements and technologies that provide motor vehicle greenhouse gas emission reductions through various means. [EPA-HQ-OAR-2010-0799-9470-A1, p.2]

(c) The flexibility necessary to achieve overall maximum greenhouse gas emission reductions from motor vehicles. [EPA-HQ-OAR-2010-0799-9470-A1, p.2]

In light of this history, it is not clear why USEPA is now effectively promoting future use of a technology rejected by California because it is known to interfere with RF transmissions. At a minimum, we ask that USEPA consider the same factors before adopting any regulation that purports to reduce vehicle cabin temperature as a means of achieving greenhouse gas emission reductions. [EPA-HQ-OAR-2010-0799-9470-A1, p.2]

Response:

We appreciate all of the comments on the off-cycle credit for glazing from all of the commenters. The range of comments fell into three main areas: 1) accounting for the overall glazing surface area in the calculations and a minimum level of solar transmittance, 2) concerns regarding metallic glazing and incentivizing this technology, and 3) granting of credit for polycarbonate (PC) glazing technology. EPA responds to the comments on PC glazing in greater detail in Chapter 5 of the TSD for this final rule (See 5.2.10). In addition, we will briefly summarize those responses here.

For the comments from the EPGAA, Guardian and PGW regarding accounting for the total glass surface in a vehicle, this is discussed further in Section 5.2.10 of TSD Chapter 5. In summary, the equation that was included for calculating the glazing benefits includes a variable for the total glazing surface area when accounting for each location where glazing is applied. Further, the comments advocate for proportional scaling based on data larger glass area. We believe that this scaling provides a perverse incentive to increase glass area on vehicles even more than levels seen today, which would in turn have deleterious environmental impacts, as the interior cabin would experience greater heat loads. Therefore, we are finalizing the format for the glazing credit formula as proposed.

Regarding the comments on metallic glazing and incentivizing this technology, this is discussed in greater detail in Section 5.2.10 of TSD Chapter 5 and Section II.F.2. of the preamble for this final rule. To briefly summarize, we met with the Enhanced Protective Glass Automotive Association, which represents the automotive glass manufacturers and suppliers, and representatives from the automotive glass industry including PGW, Guardian, and AGC to discuss the concerns with metallic glazing and the potential for signal interference and/or radio frequency (RF) attenuation (details of this meeting are available in EPA docket # EPA-HQ-OAR-2010-0799 and NHTSA docket #NHTSA-2010-0131). Based on their feedback and supporting data supplied, there was no statistically-significant increase in signal interference or RF attenuation when reflective (or metallic) glazing was used. They also supplied a list of vehicles that currently use metallic glazing was supplied but there have been no wide scale reports of signal interference or RF attenuation on these vehicles.

In addition, we received comments from the California Air Resources Board (CARB) in response to the comments on concerns with metallic glazing and it's affect on the Cool Cars Regulation, and supporting the information from automotive glass industry. CARB stated that the reason they did not finalize a mandate for metallic glazing in the Cool Cars Regulation was primarily the timing for when the signal interference and RF attenuation concerns were raised.

They also clarified that they were not requiring a specific type of glazing and that the performance-based approach ultimately adopted in the Advanced Clean Cars Regulation accomplished the same objectives as proposed under the Cool Cars Regulation. Finally, CARB also performed testing of signal interference and RF attenuation (see test results in EPA docket #EPA-HQ-OAR-2010-0799-41752) echoing the findings of the automotive glass industry that there is "[n]o effect of reflective glazing observed on monitoring ankle bracelets or cell phones" and that any "[e]ffects on GPS navigation devices [are] completely mitigated by use of [the] deletion window" placing either the device or the external antennae in this area. CARB urged EPA to finalize the proposed credit values for glass and glazing as proposed. Based on these statements, the primary reason for CARB ceasing work on the regulation was not due to concerns raised regarding reflective/metallic glazing as many of the commenters asserted.

Based on the information supplied by the automotive glass industry and CARB, there is no evidence to support the commenters' claims of significant adverse effects on signal interference and RF attenuation. However, to allay the commenters' concerns, we will emphasize that manufacturers strongly consider and evaluate the potential for signal interference and RF attenuation in their vehicle design and glazing technology when requesting the solar control glazing credit.

Regarding the comments on PC glazing, several commenters (American Chemistry Council or ACC, Bayer Material Science, California Manufacturers and Technology Association, CTIA-The Wireless Association, Garmin, SABIC Innovative Plastics, and the Society of Plastics Industry) touted the benefits of polycarbonate (PC) glazing (e.g., reduced thermal conductivity compared to glass reduced weight of PC glazing compared to other materials) and suggested that the glazing credit not be restricted to metallic glazing and, further, recommended that a separate PC glazing credit should be established. In addition, SABIC Innovative Plastics supplied an equation for calculating the thermal conductivity benefits from PC glazing similar to the equation for glazing credit in Section 5.2.10 in TSD Chapter 5.

In response, we believe it is important to note that we are not mandating a particular technology to qualify for the off-cycle glazing credit. The off-cycle glazing credit is technology neutral and performance based with manufacturers able to select the glazing technologies and designs based on desired heat rejection performance and considering signal interference or RF attenuation (if any), as discussed above. Therefore, we believe that a separate PC glazing credit is not necessary since this credit covers all types of glazing technologies.

Second, the formula we referenced in Section 5.2.10 of TSD Chapter 5 for solar transmittance is an established ISO procedure (ISO 13837) that can be used and referenced to ensure a consistent basis for information supporting the credit request. To offer a separate credit for PC glazing on the off-cycle technology menu, we would need to have a similar, established set of procedures to validate the equations, and substantiate a credit for PC glazing. Therefore, we are not including the specific equations used to calculate the benefits of thermal conductivity from PC glazing. If manufacturers believe that there is some additional benefit, they may apply for additional glazing credit using the demonstration methods for technologies not on the defined technology list. See preamble section II.E.5.

Therefore, we agree with the comments from CARB "to retain the structure of the off-cycle credits for solar control technologies." Accordingly, we are finalizing the off-cycle provisions for solar and thermal control technologies, including glazing, as proposed in this final rule. More detailed discussion on the solar and thermal technologies can be found in Section 5.2.9 of TSD Chapter 5 and Section II.F.2. of the preamble for this final rule.

The EPA also agrees with the comments from the Enhanced Protective Glass Automotive Association (EPGAA) that the off-cycle credit for solar glazing "provides simplified model for defining the impact of glazing on the heat load reduction and the emissions." and Pittsburgh Glass Works (PGW) that "the benefits of solar glazing…have been proven to reduce emissions and improve fuel efficiency."

Regarding the comments from EPGAA and PGW on capturing the additional benefits of glazing in conjunction with other advanced technologies, we encourage EPGAA, PGW and other member companies to develop measurement standards to capture these benefits. If a method for demonstrating these benefits can be developed, this process may be used for the alternate demonstration methods for technologies not on the off-cycle technology menu.

For the comments from EPGAA and PGW on the 3.0 g/mi for passenger automobiles and to 4.3 g/mi for light trucks limit for solar and thermal control technologies, the alternate method approval process for technologies not on the off-cycle technology menu is a pathway for manufacturers to demonstrate benefits and request credit above and beyond these limits. The default values in the off-cycle technology menu were developed based on available information. However, it is possible a manufacturer may have data specific to their design that exceeds the default values in the off-cycle technology menu. Therefore, the alternate method approval process would be the arena to present this information and receive credit beyond the imposed solar and thermal control technology limits.

For the comments from EPGAA and PGW regarding extension of the off-cycle technology menu to the MY2012-2016 GHG Program are discussed in Section III.C.5 of the preamble for this final rule, as well as EPA's decision to do so under the circumstances described in the preamble.

Regarding the comments from Garmin relating to a defined minimum off-cycle credit for some technologies such as in-dash GPS navigation traffic avoidance, our response to this is discussed in greater detail in Section II.F.2 of the preamble for this final rule. In summary, these technologies face a high hurdle in quantifiable associated benefit and demonstrated real-world activity. These factors make it difficult to develop a pre-defined minimum off-cycle credit and we believe that the technologies are more relevant to a more flexible, open process such as the alternate demonstration methods for technologies. As such, EPA is not including these "driver selectable" off-cycle technologies on the final rule off cycle menu.

We agree with the comments from Guardian on solar roof panels and the changes they recommended as explained in Section 5.2.4 of TSD Chapter 5. In summary, we now use the term "Solar Panels" to describe this credit and the definition in 5.2.5 of TSD Chapter 5 reflects this revised terminology. In addition, the definition also explicitly states that this credit is available for “horizontally-oriented” surfaces, not just the roof, and that the rated power for the solar panel be determined using standardized test conditions as suggested by Guardian. Finally, we agree with Guardian regarding the need to account for different panel power ratings. We received similar comments from other commenters advocating for scaling of the solar panel credit since panel power may vary. In response to their comments, we developed a formula that can be scaled according to the rated solar panel power and takes into account various environmental factors such as on average vehicle use and driving and parking conditions. These revisions are being finalized in today’s action.

In general, we believe the off-cycle technology menu will provide some certainty to requesting off-cycle credits. In addition, the technologies on the off-cycle technology menu and associated credit values are based on robust data and verifiable methods and produce real-world benefits. For technologies not on the off-cycle technology menu, we believe one of the alternate methods for approval provides manufacturers the necessary flexibility to have the agency consider other technologies.

We believe that the technologies in the off-cycle program also will be durable in-use. As noted in section III.C. 5 of the preamble to the final rule, EPA requires off-cycle components to be durable in-use and continues to believe that this is an important aspect of the program. See 86.1866-12 (d)(1)(iii). The technologies upon which the credits are based are subject to full useful life compliance provisions, as with other emissions controls. Unless the manufacturer can demonstrate that the technology would not be subject to in-use deterioration over the useful life of the vehicle, the manufacturer must account for deterioration in the estimation of the credits in order to ensure that the credits are based on real in-use emissions reductions over the life of the vehicle. In-use requirements apply to technologies generating credits based on the pre-defined list as well as to those based on a manufacturer’s demonstration. In addition, the data we used to support the credit values is based on actual, real world vehicle data, where available, and represents the durability that can be expected on future vehicle applications.

In conclusion, we believe that all of the comments were helpful to improving the off-cycle credit program and we are finalizing the off-cycle credit program with the revisions based on the comments above in this final rule.

7.3. Comments Regarding Using Pre-Approved List in MYs 2012-2016

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Honda Motor Co., Inc.
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
Chrysler Group LLC
Fisker Automotive, Inc.
General Motors Company

Hyundai America Technical Center
Johnson Controls, Inc.
Motor & Equipment Manufacturers Association (MEMA)
Porsche Cars North America, Inc. (PCNA)
Toyota Motor North America
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

The improved off-cycle technology framework for MY 2017 and later years should be made available for MYs 2012-16. The Alliance supports the additional detail and improved processes proposed for capturing off-cycle fuel economy and GHG improvements. This facet of the MY 2012-16 regulation recognizes improvements in fuel economy and GHGs that are not captured in current laboratory tests but do have real-world benefits. Recognizing the real-world improvements that these technologies achieve and how challenging it will be to place these technologies in the market, the agencies should allow automakers to apply all aspects of the revised off-cycle framework to MYs 2012-2016. [EPA-HQ-OAR-2010-0799-9487-A1, p.4]

The improved off-cycle technology framework for MY 2017 and later years should be made available for MYs 2012-16. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

The Alliance urges the agencies to allow manufacturers to utilize the off-cycle pre-defined technology list and values for MYs 2012-2016. Providing this program feature in the earlier years improves the usefulness of the credit program and encourages manufacturers to introduce the listed technologies sooner, in lieu of postponing them to MY 2017 and beyond. There is every reason to incentivize early adoption of these technologies, since this would result in real CO_2 emissions reductions. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

Additionally, such action would provide manufacturers with the same planning certainty regarding available credits as will be provided in 2017 and beyond. This in turn would help encourage earlier investments in off-cycle technologies. The alternative that an OEM faces (pathway 2 or 3) otherwise would be to make the investment without the certainty provided by the list, which may result in postponing investment until 2017. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

Off-cycle technologies will have to compete with resource demands for other vehicle technologies, and knowing that the same credit for the technology available in MY 2017 would be available starting in MY 2012 would help the business case for earlier deployment. The result could be earlier availability of GHG-reducing technologies for consumers to buy. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

Organization: American Honda Motor Co., Inc.

7. Off-cycle Credits:

- Off-cycle Credit Menu for Model Years 2012 – 2016. Honda believes that the off-cycle credits identified in the menu represent real, environmentally-beneficial reductions in greenhouse gases. Therefore, Honda proposes to allow the applicability of the off-cycle credit menu to models prior to model year 2017. Real, effective greenhouse gas reductions can be achieved by off-cycle technologies implemented before model year 2017, and their credits should be recognized. This is good public policy as it is certain that earlier, effective environmental benefits are better for society. In the preamble, EPA states: "As noted above, EPA proposes to make the list available for credit generation starting in MY 2017. Prior to MY 2017, manufacturers would need to demonstrate off-cycle emissions reductions in order to generate credits for off-cycle technologies, including those on the list." This has the potential to create significant problems and discrepancies. If EPA awards credits higher or lower than the credit menu, it will create unfairness. EPA is already modifying the 2012 -2016 requirements by removing the language requiring off-cycle technologies to be "new, innovative, and not widespread." The best approach is to allow the inclusion of the off-cycle credit menu in the 2012 – 2016 standards. [EPA-HQ-OAR-2010-0799-9489-A1, p. 5]

Organization: Association of Global Automakers, Inc. (Global Automakers)

Global Automakers supports the availability of credits for technologies that provide on-road efficiency and emissions benefits but whose benefits are not fully measured using the current city-highway test. In a number of cases, these technologies are currently known, as indicated by the "menu" of credits developed by the agencies for the proposed rule. However, given the long time-frame for the proposed standards, it is very possible that additional technologies will be identified which should qualify for off-cycle credits, and the characteristics of these technologies cannot currently be predicted. In order to provide an incentive for manufacturers to pursue the implementation of these technologies and realize the resulting benefits, it is important that the agencies provide maximum flexibility to manufacturers to obtain credits. For these reasons, we urge the agencies to avoid imposing unnecessary restrictions on qualification for off-cycle credits. The proposed rule establishes numerous restrictions on the use of off-cycle credits which appear to be arbitrary and unnecessary to the effective functioning of the GHG and CAFE programs. [EPA-HQ-OAR-2010-0799-9466-A1, p. 5]

(1) The pre-approved technology "menu." Global Automakers supports the inclusion of the menu in the regulations as a default list of pre-approved technologies, with manufacturers being authorized to petition for larger credit or credits for additional technologies, based on credible data. EPA characterizes the menu credits as being conservative estimates of actual on-road benefits, so we see no reason to limit the availability of the menu credits to MY 2017 and thereafter. Therefore, we request that EPA revise section 86.1866-12(d)(1) to make the menu credits also available in MYs 2012-16. [EPA-HQ-OAR-2010-0799-9466-A1, p. 5]

Organization: BMW of North America, LLC

As many of these technologies will be introduced in the timeframe before 2017, we would appreciate the ability to use the predefined list as soon as possible. That would avoid unnecessary workload on both sides. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 1]

Organization: Chrysler Group LLC

Recommend establishing the list of pre-approved off-cycle technologies for the 2012-2016 rule; [EPA-HQ-OAR-2010-0799-9495-A1, p. 9]

Organization: Fisker Automotive, Inc.

Support the off-cycle technology credits as proposed

Fisker supports the design-based or "menu" approach to accounting for emissions reductions benefits from off-cycle technologies proposed to start in model year 2017. This approach is simpler and imposes less of a testing burden on automakers than the approach currently in place, so we would encourage the implementation of the new approach before model year 2017. [EPA-HQ-OAR-2010-0799-9266-A1, p. 5]

Organization: General Motors Company

To help foster these technologies, we urge the agencies to also make all aspects of the updated off-cycle framework available for the 2012-2016 model years. [EPA-HQ-OAR-2010-0799-9465-A1, p. 3]

Organization: Hyundai America Technical Center

Additionally, Hyundai asks that EPA and NHTSA allow the menu technologies to be used to comply with the MY 2012-2016 regulations. [EPA-HQ-OAR-2010-0799-9547-A1, p.5]

[This comment was also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 22.]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 172.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 22-23.]

Now that the agencies have quantified the value of off-cycle technologies in a menu format, Hyundai asks that EPA and NHTSA allow the menu technologies to be used in the 2012 through 2016 model years.

Organization: Johnson Controls, Inc.

Additionally, since the 2012-2016 joint rule on CAFE and CO_2 allowed for the usage of off-cycle credits to contribute towards compliance, Johnson Controls recommends that any credits defined through the NPRM process for 2017-2025 is applied retroactively to the 2012-2016 MY regulatory timeframe. [NHTSA-2010-0131-0253-A1, p. 4]

Organization: Motor & Equipment Manufacturers Association (MEMA)

First, MEMA recommends the agencies consider making available the off-cycle credits for MY2012-2016 to encourage early implementation of these technologies without the formal review process required under the MY2012-2016 National Program rule. [EPA-HQ-OAR-2010-0799-9478-A1, pp.9-10]

Organization: Porsche Cars North America, Inc. (PCNA)

Substantial greenhouse gas improvements should be achievable in off-cycle conditions using new technologies, but procedures for earning credits must be simplified. Porsche submits the following comments on the program: [EPA-HQ-OAR-2010-0799-9264-A1, p. 5]

• The concept of a pre-defined off-cycle technology credit menu is a valuable addition, which will prevent administrative delays and eliminate the need for burdensome analyses and credit applications. However, we believe that this simplified program should be extended retroactively to the 2012-2016 program in order to accelerate innovation during these early years. [EPA-HQ-OAR-2010-0799-9264-A1, p. 5]

Organization: Toyota Motor North America

Off-Cycle Credits: Availability to 2012-2016 Model Years [EPA-HQ-OAR-2010-0799-9586-A1, p.12]

Toyota requests EPA and NHTSA revise the 2012-2016 model year regulations to allow off-cycle credits to be generated using the proposed pre-determined credit list. Such a revision of the existing regulations would promote earlier development and deployment of off-cycle technologies, which in turn could accelerate real world CO_2 reduction and fuel savings by as much as five model years. It would also provide further harmonization of the EPA and NHTSA regulations for 2012-2016 model years. In addition, the certainty of pre-determined credits for the 2012-2016 model year regulations would further minimize the need for the arbitrary sales volume threshold proposed for 2017-2025 model years. Finally, this approach is consistent with the agency's proposal to make both the revised 5-cycle and non-5-cycle demonstration methods discussed below retroactive to the 2012-2016 model year regulations. [EPA-HQ-OAR-2010-0799-9586-A1, p.12]

Organization: Volkswagen Group of America

Volkswagen supports the proposal made by the Alliance to make the credited list of technologies available for use in the 2012-2016MY regulatory program. [EPA-HQ-OAR-2010-0799-9569-A1, p. 32]

Organization: Volvo Car Corporation (VCC)

VCC also wants to emphasize that the pre-defined list from the proposal for 2017-2025 be standard for the MY 2012-2016. The purpose of granting off-cycle credits is to enable early introduction of advanced technology, so it is a reasonable strategy to incentivize early adoption of these technologies, since this would result in real CO_2 emissions reductions. [EPA-HQ-OAR-2010-0799-9551-A2, p. 6]

The off-cycle credit program in 2012-2016 is difficult for industry to utilize. Since EPA intends to maintain and also enhance the off-cycle credit program for 2017-2025, it would be helpful to strengthen the overall program by making it available for the entire 2012-2025 period. [EPA-HQ-OAR-2010-0799-9551-A2, p. 6]

• The off-cycle program should be made available for the entire 2012-2025 period. [EPA-HQ-OAR-2010-0799-9551-A2, p. 8]

Response:

There is broad support in the comments submitted by manufacturers to allow the use of the pre-defined list in MYs 2012-2016. In response to these comments, EPA is allowing manufacturers to use the pre-defined list beginning in MY 2014. EPA's full response and discussion of the topic of using the pre-defined list prior to MY 2017 is provided in Section III.C.5.b.i.

7.4. Comments Regarding Credit Cap and Sales Thresholds Proposed for Pre-Approved List

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Honda Motor Co., Inc.
Association of Global Automakers, Inc. (Global Automakers)
Borg Warner, Inc.
Chrysler Group LLC
EcoMotors International, Inc.
Ferrari
Ford Motor Company
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Mazda North American Operations
Mercedes-Benz USA, LLC
Motor & Equipment Manufacturers Association (MEMA)
Natural Resources Defense Council (NRDC)
Porsche Cars North America, Inc. (PCNA)
Toyota Motor North America
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

The proposed fleet penetration requirements and credit cap could slow new technology implementation and should therefore be removed. Throughout the NPRM, the agencies suggest that an automaker be required to apply advanced technologies to a minimum percentage of its fleet before receiving any level of credit. That would be the case even when the addition of an advanced technology to a single vehicle results in measurable, real-world GHG emission reductions. We propose that all actions be recognized, as they historically have been, on a per-vehicle-so-equipped basis. This is an equitable and efficient approach, under which every vehicle built with the required technology for our customers receives credit. The prerequisite of specific penetration rates and imposition of a credit cap are economically inefficient and inconsistent with the goals of the rulemaking and may well have the unintended consequence of delaying the introduction of these technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.4]

However, the 10% minimum penetration threshold and the credit cap are barriers to the success of this feature and could result in the level of credits being out of sync with the level of GHG reductions that is actually achieved. [EPA-HQ-OAR-2010-0799-9487-A1, p.10]

It is counterproductive and unfair to create a 10% sales threshold during the initial phase-in period before some technologies can begin earning off-cycle credits. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

It is counterproductive to cap off-cycle credit attainment at 10 grams of carbon dioxide (gCO_2)/mile. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

The proposed fleet penetration requirements and credit cap could slow new technology implementation and should therefore be removed. [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

While the Alliance strongly supports the concept of a pre-defined list, two proposed limitations -- the 10% minimum penetration rate and the 10 g/mi cap -- will constrain its ability to incentivize technology application. The public policy goal of maximizing early introduction of these technologies is at odds with both of these limitations and the NPRM fails to provide a compelling justification for either restriction. [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

Further, the 10% threshold and 10 g/mi cap add an element of planning uncertainty that discourages use of the off-cycle program. The threshold also unfairly withholds credit for actual, real-world emission reductions that are achieved in the early stages of technology roll-out, before a 10% penetration can be achieved. [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

New, innovative technologies are customarily initially introduced at low volumes in order to demonstrate the benefits, reduce costs and work through technology problems before the technology is rolled out in larger volumes. To minimize warranty concerns and expense, automakers always try to phase-in new technology at a measured pace across their fleets (often during the course of major vehicle redesigns). Requiring large step changes to get widespread penetration – i.e., above a 10% penetration - is unlikely even with these off-cycle incentives. [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

Requiring a minimum penetration rate would discourage companies from offering a new technology on a limited basis to test the technology and gauge consumer acceptance before launching it more broadly. [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

The 10% minimum penetration threshold – or any other minimum penetration rate − may also have the unintended consequence of delaying investment in some technologies, at least until they can be applied to higher-volume models. Similarly, the 10 g/mi cap on credits would discourage maximum adoption of the pre-defined off-cycle technologies. Manufacturers would have less incentive to introduce technologies that would take them beyond the cap, leaving untapped GHG emissions reductions on the table. We think it would be productive to have further dialogue with the agencies regarding these issues. [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

Organization: American Honda Motor Co., Inc.

Minimum Fleet Percentages. EPA requested comment on applying a minimum threshold of 10 percent for several of the listed technologies, and the proposed treatment of HEV/PHEV/EV specific technologies and exhaust heat recovery (see Table III-17). Honda believes that the minimum threshold concept is unnecessarily restrictive. New, expensive technologies often are applied first on more expensive, lower volume models. This process has the salutary affect of lowering a manufacturer's risk. Consumer feedback on lower volume cars can provide: a) important consumer feedback, and b) production experience prior to much higher volumes which can help lower costs. Additionally, the "minimum fleet percentages" can have the unintended consequence of slowing the introduction of new technologies into the market. Honda currently has about sixteen models in our U.S. line-up, only three of which account for 10% or more of our sales in a given year. If an off-cycle credit technology is ready for market introduction at a time when it is not convenient to add it to one of the three models that exceed 10% of sales, there would be no credit allowed for adding it to any one of the other thirteen models that Honda sells in the U.S. The fact that the credits are weighted to U.S. sales means that there is no windfall for an automaker who only manages to apply one of these technologies to less than 10% of its sales. We believe that EPA is unnecessarily complicating and constraining the introduction of off-cycle credit technologies. [EPA-HQ-OAR-2010-0799-9489-A1, pp. 5-6]

Organization: Association of Global Automakers, Inc. (Global Automakers)

(2) Cap on off-cycle credits. EPA proposes several caps on off-cycle credits. Under section 86.1866(d)(1)(i)(B), EPA establishes maximum allowed credits for thermal control technologies and advanced glazing. A cap on menu credits of 10 grams per mile is also established (paragraph (d)(1)(ii)). Manufacturers may exceed the 10 gram cap by demonstrating the benefits using 5-cycle testing or analysis. See preamble page 75023. However, since EPA characterizes the menu credits as being based on conservative estimates of benefits, we see no reason to require testing when the menu values exceed the 10 gram limit. [EPA-HQ-OAR-2010-0799-9466-A1, p. 6]

The basis for these maximum credits is not clear. EPA should either provide an explanation for the need for these caps or eliminate them. [EPA-HQ-OAR-2010-0799-9466-A1, p. 6]

(5) Minimum market penetration to qualify for credit. EPA proposes minimum market penetration rates of 10 percent of the manufacturer's combined car-truck fleet for most of the off-cycle menu technologies, in order to qualify for credits. The minimum penetration rate creates an unnecessary impediment to the introduction of new technologies. The off-cycle technologies may be relatively new items, and consumers may not be familiar with these items. Implementation of these technologies at low levels may, if successful, lead to substantial benefits in the future, and manufacturers should be encouraged to pursue such technologies. A smaller penetration rate would create a correspondingly smaller credit, so we see no problem being created at lower penetration levels. EPA has failed to demonstrate a clear need for the minimum penetration restriction. [EPA-HQ-OAR-2010-0799-9466-A1, p. 7]

Organization: Borg Warner, Inc.

However, we also believe there should not be a double standard of requiring a 10% market penetration threshold for non hybrid-based technologies and no market penetration requirement for hybrid-based technologies in order to receive the off-cycle credit. There are technologies that are much less proven than hybrids and this threshold could unnecessarily complicate and discourage the introduction of new, higher risk, technologies. Credit would only be given for those vehicles with the technology, so a lower penetration rate has no artificial benefit.[EPA-HQ-OAR-2010-0799-9320-A1, p. 2]

Organization: Chrysler Group LLC

Oppose minimum penetration rates for all technologies and the 10 g/mi maximum cap for using the credit table as unnecessary restrictions; [EPA-HQ-OAR-2010-0799-9495-A1, p. 9]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 54-55.]

And, finally, there are references to minimum penetration levels in various aspects of the proposed rule. These thresholds are unnecessary in our opinion and serve as potential disincentives to invest in new technologies. We propose that all actions be recognized as they had historically been on a per-vehicle-so-equipped basis. This is an equitable approach where every vehicle built with the required technology for our customers is acknowledged. If a minimum penetration rate is required, a manufacturer may be discouraged from pursuing innovative technologies with uncertain acceptance and possibly no credit or payback.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 61-62.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 26-27.]

And finally, there are references to minimum penetration levels in various aspects of the proposed rule. These thresholds are unnecessary and will serve as potential disincentives to investing in new technologies. We propose that all actions be recognized, as they have been historically, on a per-vehicle-so-equipped basis. This is an equitable approach where every vehicle built with the required technology for our customers is acknowledged.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 62.]

If a minimum penetration rate is required, the manufacturer will be discouraged from pursuing innovative technologies with uncertain acceptance and possibly no credit or pay backs.

Organization: EcoMotors International, Inc.

Except for technologies specific to HEVs/PHEVs/EVs (e.g., solar roof panels) and exhaust heat recovery, EPA is proposing to require minimum penetration rates for the pre-approved off-cycle technologies - 10% of a manufacturer's combined car and light truck production. Again, EcoMotors encourages the agencies to remove the market penetration requirements established for the credits, to better reflect historic market penetration issues facing new technologies. As discussed above, new technologies typically take years to prove themselves and attain significant market penetration. Thus, 10% is likely too high a threshold for these technologies during the time period in question. [EPA-HQ-OAR-2010-0799-9594-A2, p. 13]

However, EcoMotors encourages the agencies to remove the market penetration requirements established for some of the off-cycle credits in order to better reflect historic market penetration issues facing new technologies. [EPA-HQ-OAR-2010-0799-9594-A2, p. 13]

Organization: Ferrari

It is also necessary to eliminate the minimum market penetration requirement for such technologies. If a vehicle is fitted with one or more of such technologies it can reduce the GHG emissions, and therefore it make sense to account that, even if only a small percentage of the manufacturer fleet is equipped. [EPA-HQ-OAR-2010-0799-9535-A2, p.14]

Organization: Ford Motor Company

Ford is not in favor of the proposed minimum penetration thresholds that have been proposed for the menu technologies. As new technologies are developed, they are often introduced on certain models or trim levels, as opposed to making them widely available across the entire fleet. The gradual introduction of new technologies reflect product cycle plan cadence, the need to gain in-use experience and familiarity with a new technology, and customer acceptance and/or interest in a new feature or option. Generally, we anticipate that the technologies will become more widespread over time. However, requiring a minimum sales threshold does not incentivize the introduction of these technologies, which typically require extensive development at significant cost. Instead, manufacturers may choose not to implement new technologies, or to delay introduction based on the fact that they cannot know with certainty if they will be able to meet the proposed penetration rates. In fact, we find ourselves aligned with the agencies when they state that "…for most of these technologies the agencies have no data on what the rates of penetration of these technologies would be during the rule timeframe" (76 Fed. Reg. 74941). The business cases for some of these new technologies will be based on the ability to achieve expected credit amounts. If the credit is contingent upon a volume threshold, which in turn is contingent upon marketplace factors beyond our control, manufacturers may find it difficult to justify the incorporation of the technology. Ford therefore recommends that the agencies award credits on a per-vehicle-so-equipped basis, or alternatively consider some flexibility in the minimum penetration rates, such as a phase-in over time. We would like the opportunity to explore this issue further with the agencies in the future. [EPA-HQ-OAR-2010-0799-9463-A1, p. 17]

For similar reasons, Ford also does not support the proposed 10 g/mile fleet-based cap on credits earned from using technologies from the pre-approved menu as it may discourage manufacturers from maximum adoption of the pre-defined technologies. [EPA-HQ-OAR-2010-0799-9463-A1, p. 17]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 35-36.]

In order to pave the way for such technologies, manufacturers must have confidence that their efforts and investment will be evaluated fairly and given appropriate credit.

We also strongly encourage that the agencies to reconsider the production volume thresholds that have been established in order to reflect new technology introductions in our compliance strategy.

Setting high thresholds, which are entirely dependent on consumer acceptance, may actually serve a hindrance to the investment of these new technologies.

Organization: Hyundai America Technical Center

3) Market Penetration Requirement: EPA has proposed that credits for most off-cycle menu technologies will only be available if an automaker achieves a minimum market penetration rate of 10% of its combined fleet. Hyundai believes that if the agency wants to encourage new technology, such a hurdle should not be included. EPA notes that the 10% threshold does not apply to hybrids or electric vehicles because EPA does not want to impede the introduction of these technologies. The same should hold true for off-cycle technologies. Often times, off-cycle technologies are only introduced in limited production initially until they are proven in the marketplace. Yet, there are still benefits available even if a technology is not widely adopted. We ask that EPA encourage the introduction of innovative and efficient technologies by eliminating minimum penetration levels. [EPA-HQ-OAR-2010-0799-9547-A1, p.5]

EPA plans to implement a 10 gram cap on the menu credits for off-cycle technologies because they are based on limited data. However, EPA notes that these credits are conservative and Hyundai agrees. For this reason, and because it is possible to exceed 10 grams using the menu technologies, we do not believe a cap is necessary and urge the agency to remove it. The industry should receive credits for all applications that provide real world benefits without requiring additional testing. [EPA-HQ-OAR-2010-0799-9547-A1, p.5]

[This comment was also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 22.]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 172-174.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 23.]

We recommend also that the agencies eliminate the ten-gram cap on the menu technology.

EPA planned the cap because the menu technology credits are based on limited data. However, Hyundai agrees with the agency that the credits offered are conservative and thus a cap is not necessary.

Organization: International Council on Clean Transportation (ICCT)

Because some uncertainty is inherent even in a well-designed process the ICCT also supports the proposed 10 g/mile cap. ICCT's comments on specific off-cycle credits below are designed to make the off-cycle credit system as accurate as possible and to maximize the overall benefits of the rule. The NPRM and draft TSD show that some of the technologies meet ICCT's recommended criteria for off-cycle credits, such as some of the proposed AC system credits, while other proposed off-cycle credits do not. We note that excluding the later category will not affect the very favorable benefit-cost ratio for this rule because the draft TSD did not consider these technologies in that analysis. [EPA-HQ-OAR-2010-0799-9512-A1, p. 37]

Organization: Mazda North American Operations

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 64.]

While we strongly support the concept of a predefined list of off-cycle technologies, we urge the agencies to eliminate the proposed 10 percent minimum penetration rate. Requiring a minimum penetration rate would discourage companies from offering a new technology on a limited basis to test the technology and gauge consumer acceptance before launching it more broadly.

Moreover, new technologies are typically added when a model is redesigned or updated. To give a specific example, adding one of the off-cycle technologies on the predefined list to either the Mazda2, Mazda5 or the Miata models would result in no credit because they each account for less than 10 percent of our fleet. The 10 percent minimum penetration threshold or any other minimum penetration rate may well have the unintended consequence of encouraging manufacturers to postpone technology application until a model that accounts for the acquired percentage is redesigned rather than installing it earlier on a lower volume model.

Organization: Mercedes-Benz USA, LLC

The off-cycle credits are necessary to continue to provide an incentive for these technologies to assure their continued implementation. Incorporating these technologies into vehicles with lower price points and smaller volumes remains challenging from a cost perspective, and the ability to do so may require longer lead times before certain technologies proliferate through the fleets. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-2]

The agencies should gain the maximum benefit from off-cycle technologies by applying the credits on a vehicle basis, rather than requiring threshold penetrations before the credits can be applied. A threshold requirement deters incremental investment, especially on lower volume model lines, and may detract from overall, real world CO_2 emissions reductions. Manufacturers should be recognized for applying off-cycle technologies in all vehicles. Similarly, since off-cycle credits must meet demonstrated performance criteria linking them to real world CO_2 reductions, imposing caps on the off-cycle credits would be inconsistent with the real world benefits and a detraction from the incentive that the agencies are intending to provide. Accordingly, DAG urges the agencies to apply off-cycle credits on a per vehicle basis without threshold penetration rates and without artificial caps. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-2]

Organization: Motor & Equipment Manufacturers Association (MEMA)

However, the current cap on credits is ultimately limiting. Removing the cap would reward the full lot of vehicles/technologies that achieve or exceed the National Program goals of reduced emissions and improved fuel consumption. Thus, MEMA urges the agencies to remove the cap on credits. [EPA-HQ-OAR-2010-0799-9478-A1, p.5]

First, regarding the off-cycle technologies' credits, MEMA believes the agencies' minimum penetration requirement of 10 percent of manufacturer's overall combined car and light truck production (with the HEV, PHEV and EV exceptions) is not only a significant hurdle for OEMs to meet, but also an undue influence of the market pushing the "preferred vehicle technologies" that we discussed earlier in our comments. Therefore, MEMA requests that the penetration rates for off-cycle technologies should be eliminated entirely, so that the marketplace can determine "winners and losers." [EPA-HQ-OAR-2010-0799-9478-A1, p.7]

Penetration rate requirements and caps on credits should be eliminated. [EPA-HQ-OAR-2010-0799-9478-A1, p.13]

Organization: Natural Resources Defense Council (NRDC)

While NRDC strongly supports the use of a cap per manufacturer for off-cycle credits, NRDC believes it is critical that EPA fully evaluate the adequacy of the 10 g/mi cap level, given the uncertainties in real, verifiable emissions reduction. EPA should adopt a lower cap if necessary. [EPA-HQ-OAR-2010-0799-9472-A2, p. 14]

Organization: Porsche Cars North America, Inc. (PCNA)

• Imposing an arbitrary 10 grams/mile cap for total off-cycle credit has no basis in real world accounting, and is counterproductive to innovation. The Agencies should encourage maximum adoption of all GHG improvements by providing unlimited additive credits. [EPA-HQ-OAR-2010-0799-9264-A1, p. 5]

• It is counterproductive and unjust to impose a 10% sales threshold before some technologies can earn off-cycle credits. Every gram of GHG improvement is just as valuable as any other. In addition, gradual introduction of new technologies is often necessary, and should not be penalized. Sensible sales weighting would provide more reasonable credit accounting. [EPA-HQ-OAR-2010-0799-9264-A1, p. 5]

However, there is no engineering justification for setting arbitrary limits and thresholds for credit availability. To be a meaningful feature of the program, the level of off-cycle credit must be in sync with the level of actual GHG reductions. Worse, such limits and thresholds are potentially a perverse disincentive to introduce valuable innovations or to maximize penetration of known technologies. Ironically, it is likely that such disincentives will thus unnecessarily increase actual GHG emissions. [EPA-HQ-OAR-2010-0799-9264-A1, p. 5]

Organization: Toyota Motor North America

Off-Cycle Credits: Pre-Determined Credit List (10 Percent Sales Volume Threshold) [EPA-HQ-OAR-2010-0799-9586-A1, p.11]

EPA's intent is for the 10 percent minimum sales threshold is to encourage companies to more rapidly adopt off-cycle technologies for larger volume vehicle models and bring these technologies into the mainstream. Toyota opposes a minimum sales volume threshold for generating off-cycle credits and we believe a threshold will be counterproductive to achieving EPA's goal. [EPA-HQ-OAR-2010-0799-9586-A1, p.11]

If the agencies expand the list of technologies on the pre-determined list in the future and/or as more performance data on off-cycle technologies becomes available, Toyota requests that the 10 g/mi cap be revisited. This could be done as part of the mid-term review. [EPA-HQ-OAR-2010-0799-9586-A1, p.11]

First, GHG benefits are realized for each and every vehicle purchased with a given off-cycle technology. The accumulation of benefits does not somehow begin when an arbitrary sales threshold is met. As such, manufacturers should earn credits for each and every vehicle sold with a given off-cycle technology. Second, an arbitrary sales threshold does not recognize the potential for high deployment rates on low sales volume vehicles. As proposed, a manufacturer could introduce an off-cycle technology over an entire model or configuration, but not be eligible for credits if that model or configuration does not make up at least 10 percent of the manufacturer's fleet. Third, absent market demand, the arbitrary 10 percent sales threshold will do nothing to speed deployment due to significant risks to the manufacturer. Despite the motivation for a rapid return on investment, new technologies typically enter the market at a slow pace. It is common practice for new automotive technologies to be introduced on a single model, or even single configuration within a model. This low production trial period allows manufacturers to monitor technology performance and reliability, gauge consumer acceptance, and make necessary adjustments before expanding the technology to other models. Technology is typically integrated into those other models during a redesign, which typically occurs every five to seven years. Achieving a 10 percent sales threshold could literally take years to achieve depending on the technology. Appendix I shows actual penetration rates for various automotive technologies, and while consumer uptake rates vary, achieving a 10 percent market penetration can take a decade or more for certain technologies. Finally, the proposed sales threshold could actually create a disincentive for manufacturers to deploy off-cycle technologies. The risk of forcing off-cycle technology on consumers beyond natural market demand and then falling short of the 10 percent threshold provides a substantial disincentive for even trying, unless the manufacturer is extremely confident the threshold can be reached. [EPA-HQ-OAR-2010-0799-9586-A1, pp.11-12]

Organization: Volkswagen Group of America

Further, the max fleet improvement, commonly referred to as the 'credit cap', of 10g/mi should be increased on a regular basis as new technologies are added to the list. The will further improve the value of this flexibility and provided added planning certainty as newer technologies are added to the list. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 32-33]

Volkswagen supports the comments of the Alliance that the penetration threshold should be removed and that credits are awarded on a per-vehicle equipped basis. We echo the concerns raised by the Alliance regarding fleet phase-in trends for new technologies and agree that the high threshold may inadvertently create a disincentive to delay new technology. [EPA-HQ-OAR-2010-0799-9569-A1, p. 33]

Organization: Volvo Car Corporation (VCC)

In the NPRM, the proposed penetration requirements of 10% risk hobbling the entire proposal and the program may fail to work in practice. The 10% sales threshold may limit a smaller manufacturer from introducing new innovative, but uncertain, technology. VCC supports the approach taken in Europe of one car one credit. However, any threshold should start at 0% in order to expedite advanced technologies. [EPA-HQ-OAR-2010-0799-9551-A2, p. 6]

• It is counterproductive to create a 10% sales threshold during the initial phase-in period. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

• The 10% sales threshold may limit the small manufacturer from introducing new technology due to the uncertainty around the possible credit situation. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

Response:

10 Percent Penetration Threshold

EPA received many adverse comments from manufacturers regarding the proposed 10% production threshold for the pre-defined list and no comments in favor of the proposal. As discussed in section III.C.5.b.i of the preamble, EPA understands and agrees with the concerns raised by commenters that the proposed requirement could well be counterproductive, and is therefore finalizing the off-cycle credits program without the 10% threshold requirement.

10 g/mile Credit Cap

EPA received several comments from manufacturers recommending that EPA eliminate the 10 g/mile fleetwide cap on credits that could be generated using the predefined list. EPA also received comments from ICCT and NRDC supporting the proposed 10 g/mile cap. Further, some commenters commented that the pre-defined list should be revisited and updated on regular intervals. EPA is retaining the 10 g/mile cap as proposed. The full discussion on comments is provided in section III.C.5.b.i and II.F. of the preamble. As there explained, the cap is only on the amount of default credits under the menu. Manufacturers remain free to provide data to demonstrate on a case-specific basis through the 5-cycle testing or public review pathways that additional credit values are warranted for their technology, even though that technology is included on the menu.

7.5. Step-by-Step Process and Test Procedures

Organizations Included in this Section

Alliance of Automobile Manufacturers
Association of Global Automakers, Inc. (Global Automakers)
Ford Motor Company
Hyundai America Technical Center
Motor & Equipment Manufacturers Association (MEMA)
Toyota Motor North America
United Automobile Workers (UAW)
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

Regarding the EPA approval process for technologies not included in the pre-defined list, the Alliance welcomes the efforts to provide a step-by-step process and 60-day timeline for approval of new technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.10]

The process changes outlined below would further streamline the program and provide more certainty to manufacturers irrespective of which approval process is used. [EPA-HQ-OAR-2010-0799-9487-A1, p.10]

Process for Qualifying Off-Cycle Credits from New Technologies [EPA-HQ-OAR-2010-0799-9487-A1, p.42]

EPA originally adopted this program for model years MYs 2012-2016 as an optional credit opportunity for new and innovative technologies that reduce vehicle CO_2 emissions, but for which CO_2 reduction benefits are not significantly captured over the 2-cycle test procedure. The agency adopted the off-cycle credit option to provide an incentive to accelerate the introduction of these types of technologies that result in concrete reductions in CO_2 emissions. However well-meaning this program, its actual use has been undermined by uncertainties over which technologies would be deemed eligible, how much credit would be provided, and the risks and burdens on manufacturers inherent in a cumbersome case-by-case approval process. [EPA-HQ-OAR-2010-0799-9487-A1, p.42]

The NPRM would require three complete sets of 5-cycle tests (with technology “on” and technology “off”) for relatively large impacts of over 3% GHG reduction. For technologies with less than a 3% impact, manufacturers would be required to run five complete 5-cycle tests (with technology “on” and technology “off”), plus complete an analysis using EPA’s Vehicle Simulation Tool. It can be expected that almost all of the off-cycle technologies will individually yield emission reductions of less than 3%, making mandatory the completion of five full test series and the simulation analysis. [EPA-HQ-OAR-2010-0799-9487-A1, pp.42-43]

While an extensive off-cycle credit menu will result in the largest portion of off-cycle emission reductions, the regulatory agencies also need to have an open system for submitting and evaluating new off-cycle technologies, since an ongoing flow of new technologies can be expected. In this regard, simplicity and openness should be the goals, since the program benefits from bringing in new approaches that can be developed into future credit menu items for widespread implementation. As currently proposed, the provisions for off-cycle credit applications require very extensive vehicle testing and modeling. These proposed requirements lean towards a very high level of accuracy and proof, but would also serve to hinder the flow of new technologies by setting such a high administrative burden. [EPA-HQ-OAR-2010-0799-9487-A1, p.43]

Our expectation is that the vast majority of credits would be pursued through the menu, and that the process for alternative individual applications will represent a small amount of total credit. It may be counterproductive to require a high test and analysis burden, in return for small credits, since manufacturers may choose simply not to undertake such unattractive projects. This may discourage efforts which, if undertaken, could eventually grow beyond the initial low-volume stage into widespread usage, with corresponding broad emission benefits. This was, after all, the original goal of the MY 2012-2016 off-cycle program. [EPA-HQ-OAR-2010-0799-9487-A1, p.43]

The Alliance proposes some simplifications to these provisions. Based on our members’ experiences over the past year evaluating technologies for off-cycle credit in the MY 2012-2016 timeframe, we would expect that the credit menu would be used almost universally to gain credit for any technologies that are listed on the menu, rather than testing and quantifying slightly larger credits for each model under this section of the regulation. The overwhelming majority of credits would be expected to flow from the menu, and the relatively small amount of credits arising through this alternative section of the regulation does not warrant the proposed very high level of accuracy and documentation through repeat testing and modeling. [EPA-HQ-OAR-2010-0799-9487-A1, p.43]

In order to encourage development of new technologies under this section of the regulation, the Alliance recommends that only three five-cycle tests be required for all applications, with no requirement to use the EPA Vehicle Simulation Tool. This retains a high level of accuracy, but with lower administrative obstacles. We expect the mechanism for energy savings to be easily explained and, if documented through actual vehicle testing, do not see the need to also conduct simulations. Although we have no experience with this particular tool, we anticipate that any single simulation tool may not be compatible or easily adaptable to analyze specific, unusual technologies, especially technologies which address the proliferation of very diverse sources of off-cycle energy losses. [EPA-HQ-OAR-2010-0799-9487-A1, p.43]

We also recommend that EPA retain discretion to approve applications which forego some of the 5-cycle tests if such testing is deemed unnecessary. In many cases, technologies would reasonably be expected to have no impact on certain test cycles. For example, cold weather technologies might be expected to have no impact on the SCO3 cycle. In these cases, it would be wasteful to require multiple tests for cycles which do not impact the credits. [EPA-HQ-OAR-2010-0799-9487-A1, p.44]

Organization: Association of Global Automakers, Inc. (Global Automakers)

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 51.]

Second, the agencies should carefully consider the relationship between the creation of incentives under the new standards and the development of alternative test procedures to assess the incentivized technologies. Global Automakers strongly supports incentivizing technologies whose potential benefits are not fully measured under the 1975 CAFE test procedure. Air conditioning efficiency, off-cycle, and advanced technology incentives are justified based on their potential long term, real world benefits. Such incentives will typically take the form of compliance credits that are assessed using alternative test procedures. In developing incentives for the final rule, the agencies need to carefully consider how to reconcile these incentives with the testing procedures required by law. [EPA-HQ-OAR-2010-0799-9466-A1, p.2]

[[This comment can also be found in Outline Heading 3.2.1.]]

Organization: Ford Motor Company

Beyond the pre-defined list of off-cycle methods, Ford supports the allowance of alternative pathways for achieving off-cycle technology benefits and the efforts the agencies have taken to attempt to streamline the process, as compared to the previous method finalized in the 2012-2016 MY rule. We agree with the Alliance recommendations on how to further refine that process and avoid unnecessary test burden. Related specifically to the technology demonstration pathway using the EPA 5-cycle methodology, we believe that the proposal to demonstrate at least a three percent off-cycle benefit in order to claim credits amounts under 40 CFR § 86.1866-12(d)(2)(iii) is too high. EPA suggests a 3% threshold based upon historical test speed vs. time tolerance data for chassis dynamometer testing. Given the +/- 1.5% drive cycle energy tolerances outlined in 40 CFR § 1066.425(c)(1) and described in detail in SAE J2951, future test to test variability will be substantially reduced. As such, a tolerance of 1.5% is recommended in lieu of the proposed 3%. [EPA-HQ-OAR-2010-0799-9463-A1, p. 17]

Organization: Hyundai America Technical Center

4) Durability Demonstration: EPA states that 'manufacturers may demonstrate in-use emissions durability at the time of certification by submitting an engineering analysis. This demonstration may also include component durability testing or whole vehicle aging if the manufacturer has such data. The demonstration would be subject to EPA approval prior to credits being awarded. Since credits are not actually generated until the final CAFE and GHG reports after the end of the model year, Hyundai requests that EPA provide manufacturers additional time to generate the durability data, if necessary (e.g. six months after certification). [EPA-HQ-OAR-2010-0799-9547-A1, pp.5-6]

5) Public Notice of New Technologies: The agency proposes that credits for new off-cycle technologies benefit from a public comment period. Hyundai supports a process to provide transparency for the off-cycle credit approval process. However, it is unclear from the proposal language whether the approval process will be completed and credits will be available in the same year the automaker provides data and requests approval for new off-cycle technologies. Hyundai recommends that the agencies create a standardized and streamlined process to ensure that credits are available in the year requested. [EPA-HQ-OAR-2010-0799-9547-A1, p.6]

Organization: Motor & Equipment Manufacturers Association (MEMA)

Lastly, in cases where the technologies are not yet fully developed, but are expected to be in the future, MEMA agrees that the step-by-step process the agencies outline in the NPRM is an appropriate and transparent process. This way, future technologies can be reviewed, vetted and considered for approval in a straight-forward and timely process. MEMA believes this is another important component to the long-term success of the National Program, to allow for the inclusion of and credits for yet-to-be-seen evolutions in off-cycle technologies and related efficiency benefits. [EPA-HQ-OAR-2010-0799-9478-A1, p.7]

Organization: Toyota Motor North America

Third, EPA has proposed changes in §86.1866-12(d)(2) and (3) in order to streamline and clarify the demonstration process to promote greater manufacturer participation and encourage greater deployment of off-cycle technologies.[EPA-HQ-OAR-2010-0799-9586-A1, p.10]

Off-Cycle Credits: EPA 2012-2016 Model Year Regulations [EPA-HQ-OAR-2010-0799-9586-A1, p.10]

For the 2012-2016 model year GHG standards, EPA's regulations provide credits for technologies that reduce CO_2 in real world operation that are not well represented on the test procedure used to determine a vehicle's fuel economy or tailpipe GHG emissions. The 2012-2016 model year provisions are limited to new and innovative technologies, and manufacturers can demonstrate the benefits of such technologies using a two-tiered process. First, a manufacturer can demonstrate benefits through EPA's 5-cycle method used for determining fuel economy label values. If the 5-cycle method is inadequate for demonstrating benefits, the manufacturer can work with EPA to develop a test plan customized for a specific technology. EPA approval of both the test plan and demonstrated off-cycle benefits are made on a case-by-case basis. In implementing the current off-cycle provisions, EPA has discovered that manufacturers have been discouraged from applying for off-cycle credits because of the uncertainty and potential testing burden associated with the current provisions. [EPA-HQ-OAR-2010-0799-9586-A1, p.10]

Revised 5-Cycle Demonstration Program [EPA-HQ-OAR-2010-0799-9586-A1, p.12]

For credits not generated by the pre-determined list, but rather through 5-cycle testing, EPA has proposed measures to more precisely define both the manufacturer's testing requirements and EPA's approval. The proposal involves up to three iterations of demonstration. [EPA-HQ-OAR-2010-0799-9586-A1, p.12]

First, a manufacturer must conduct three complete sets of 5-cycle tests, once with the technology 'off' and once with the technology 'on'. If that testing shows less than three percent improvement, two additional 5-cycle tests (with the technology 'on') are required. If at least a 3 percent improvement still cannot be demonstrated, EPA's Vehicle Simulation Tool is used to determine the technology's benefits. We have several concerns with this approach. Toyota anticipates that most off-cycle technologies will individually yield emission reductions of less than three percent, as none of the technologies on the pre-determined list alone would meet the three percent criteria. This means the full set of five-cycle tests and the simulation analysis would essentially become the de facto procedure. This full level of demonstration would require over 40 tests per vehicle model. Bundling technologies could reduce test burden, but we assume those technologies would then need to be bundled for sale, which could be prohibitively expensive. [EPA-HQ-OAR-2010-0799-9586-A1, p.12]

Toyota appreciates that EPA has made the 5-cycle demonstration procedure clearer. However, in doing so, the procedure has become is too burdensome to be practical. We request the agency consider alternatives to reduce the burden. For example, the second iteration of 5-cycle testing seems unlikely to yield significantly different results than the initial testing and should be eliminated. We also request EPA consider dropping components of the 5-cycle test if good engineering practice suggests that test element is not a factor in demonstrating the benefits for a given technology. For example, if it is clear that an active warm up technology does not affect greenhouse gas emissions or fuel economy performance over the US06, the US06 should not be required. Finally, EPA has not made the simulation tool available; therefore Toyota has no basis upon which to comment on this method of verification. If simulation ultimately proves a viable method for quantifying off-cycle credits, EPA should allow it to be used in lieu of 5-cycle testing. [EPA-HQ-OAR-2010-0799-9586-A1, p.13]

Demonstration Not Based on 5-Cycle Testing or Simulation [EPA-HQ-OAR-2010-0799-9586-A1, p.13]

EPA proposes to continue allowing manufacturers to request demonstration of off-cycle credit levels using methods other than 5-cycle testing or EPA's simulation method. While the proposal to establish an agency decision deadline and agency report provides more transparency in EPA's decision making process, what constitutes an acceptable testing program still remains unclear in the current proposal. The inherent uncertainty in manufacturer-proposed demonstration makes it less appealing to Toyota and reiterates the need for a more inclusive pre-determined technology list that is retroactive to the 20122016 model year standards. [EPA-HQ-OAR-2010-0799-9586-A1, p.13]

Organization: United Automobile Workers (UAW)

We also applaud the EPA's recognition that other technologies not listed could prove beneficial in the future, or that the actual reductions achieved from the listed technologies could exceed EPA's original assessment of them, and proposing that manufacturers may gain additional credits by supplying credible and verifiable data about improvements from any particular technology. [EPA-HQ-OAR-2010-0799-9563-A2, p.3]

Organization: Volvo Car Corporation (VCC)

VCC supports simplifying the verification requirements for off-cycle credits. [EPA-HQ-OAR-2010-0799-9551-A2, p. 6]

The proposal is requiring three complete sets of 5-cycle tests, with and without the technology for CO_2 impacts of over 3% GHG reduction. For technologies with less than a 3% impact, manufacturers are required to run five complete 5-cycle tests with and without the technology, plus complete an analysis using EPA's Vehicle Simulation Tool. The requirement of 3% is a large number for a CO_2 effect and most technologies will be around 0.5-1.5 %. This will mean that extensive testing will be necessary in order to request off-cycle credits. This extensive testing would impact smaller manufacturers disproportionately since the cost per vehicle would be higher. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

To encourage development, the EPA-simulation tool should not be the only permitted means of presenting simulations; other simulation for applicable pre-confirming data should be permitted if they are reasonably accurate. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

To confirm the application, either the EPA Vehicle Simulation Tool or only three five-cycle tests should be required. This would ease the burdens on manufacturers by keeping testing to a minimum, while maintaining accuracy at a good level. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

• The procedures for earning off-cycle credits need to be kept simple. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

• Once a technology has been approved by an agency it should be applicable for all agencies - both EPA and CARB. [EPA-HQ-OAR-2010-0799-9551-A2, p. 7]

Response:

EPA received generally supportive comments regarding its proposal to adopt a streamlined step-by-step process for credits not based on the pre-defined list. EPA received comments that the 5-cycle testing requirements should not include additional testing or vehicle simulation beyond the initial three sets of tests. EPA also received comments that manufacturers should not be required to run test cycles where the off-cycle technology is known not to provide emissions reductions. EPA concurs with these comments. In response to the points raised by commenters, EPA will not make additional testing and vehicle simulations mandatory. Rather, EPA will have discretion to request additional testing in cases where the agency determines that the additional test would provide useful data in verifying credit levels. Further, EPA is not requiring manufacturers to use the EPA simulation tool, but EPA may use the simulation tool as a check to help verify the level of credits as part of the credit approval process. Also, EPA will allow manufacturers to avoid unnecessary testing by instead submitting an engineering analysis demonstrating that the technology has no effect (either positive or negative) on emissions for one or more of the 5-cycle tests. These comments and provisions are discussed further in preamble Section III.C.5.b.iii.

EPA received a mix of comments from manufacturers regarding the use of vehicle simulations. The Alliance and Toyota opposed incorporating the EPA Vehicle Simulation Tool into the 5-cycle approval process. Volvo supported the use of EPA's simulation tool (and others) and suggested that it should be allowed to be use in lieu of vehicle 5-cycle testing. As noted above, EPA is not requiring the use of the vehicle simulation tool but may use it to further confirm test results. At this point, EPA is also not prepared to accept vehicle simulation results from manufacturers in lieu of 5-cycle testing as the basis for credits not derived from the pre-defined list. EPA is taking a more conservative approach of requiring 5-cycle testing and using vehicle simulations as a tool to further confirm the appropriateness of the credit value. EPA notes that vehicle simulations may be part of the methodology for credits based on the public process (for credits not based on 5-cycle testing or the pre-defined list).

In response to Hyundai's concerns regarding the timing of data submittal, EPA is clarifying these provisions as discussed in preamble sections III.C.5.b.iv and Section III.C.5.b.v.

7.6. Comments Regarding Technology Eligibility Criteria

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Honda Motor Co., Inc.
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
Ferrari
Ford Motor Company
Motor & Equipment Manufacturers Association (MEMA)
Toyota Motor North America

Organization: Alliance of Automobile Manufacturers

Finally, opportunities exist to streamline traffic flow, reduce congestion and reduce emissions through better driving. For example, there are technologies that provide the driver or the vehicle with information for improved routing, or that provide the driver or the vehicle with information for more efficient vehicle operation. GPS technology can play a role in improving both driver behavior and vehicle operation. The opportunities for improvements through these eco driving technologies are not sufficiently defined for the Alliance to propose specific credit definitions and criteria at this time, but the industry hopes that it can work with the agencies in the future to create off-cycle credits for these technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.11]

The minor proposed changes in terminology are directionally correct but do not alleviate the overwhelming need to streamline the process by incorporating the pre-defined technology list for MYs 2012-2016 as well as the later model years. [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

Organization: American Honda Motor Co., Inc.

Dealer-Installed Options. Furthermore, some off-cycle technologies can be installed at the dealership. Honda proposes that off-cycle credit technologies that are installed on a vehicle prior to its first retail sale, whether at the factory or at a dealership, can be included in the minimum percentage calculation and in an OEM’s credit calculation. For example, engine-block heaters are sold in cold-weather states as a dealer-installed option. Engine-block heaters keep engine oil warm, reducing friction and improving fuel economy and lowering CO_2. (Honda recognizes that an engine-block heater might not itself qualify for off-cycle credits, it is illustrative of market-specific, dealer-installed options that could increase marketability of the kinds of technologies EPA wants to endorse). [EPA-HQ-OAR-2010-0799-9489-A1, p. 6]

Organization: Association of Global Automakers, Inc. (Global Automakers).

(3) Credits for “integral” technologies. EPA proposes that technologies that are integral to the basic vehicle design, including engine transmission, mass reduction, passive aerodynamic design, and base tires, are ineligible for credits. See 76 FR 75024. In other words, the credits would only be available for “add-on” technologies. EPA imposes this restriction based on its belief that it would be difficult to establish the credit by making a clear comparison of the vehicle’s performance using baseline and advanced forms of the technology in question. In our view, the difficulty of making a credible demonstration of the benefits of an off-cycle technology should not be judged in advance of any data that might be developed by a manufacturer. It may well be that making a credible demonstration of benefits for some of these integral technologies will be difficult, but that is no reason to deny manufacturers the opportunity to make such a demonstration. If EPA finds such a demonstration to lack credibility, it would of course be able to deny the manufacturer’s credit request. [EPA-HQ-OAR-2010-0799-9466-A1, p. 6]

(4) Credits for technologies that are included in the agencies’ standard-setting analysis. EPA states in the preamble to the proposal (76 FR 75023) that technologies that are included in the agencies’ standard-setting analysis may not generate off-cycle credits (with the exception of active aerodynamic devices and engine stop-start systems). EPA states that allowing such credits for these technologies would amount to “double-counting” of benefits. However, there may emerge by 2025 advanced levels for current technologies that are capable of achieving greater

benefits than current systems. If a manufacturer can demonstrate that an advanced version of one of the technologies that is included in the standard-setting analysis can achieve greater benefits than projected by the agencies, and those benefits are not captured with the current test procedure, there is no justification for excluding these technologies from the off-cycle credit program. [EPA-HQ-OAR-2010-0799-9466-A1, p. 6]

Organization: BMW of North America, LLC

More specifically, we support EPA's proposal to delete the 'not significantly measureable over the 2-cycle test' and to delete the 'new, innovative, not widespread use' as criteria. These new approaches make the application for credits for off-cycle technologies more attractive and therefore can be seen as a driver for innovation. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 1]

Organization: Ferrari

Regarding off-cycle technologies, we agree with EPA to remove the criteria in the 2012- 2016 rule that off-cycle technologies must be “new, innovative, and not widespread” because these terms are imprecise and could create implementation issues and uncertainty in the program. [EPA-HQ-OAR-2010-0799-9535-A2, p.14]

Organization: Ford Motor Company

The three methods outlined in the NPRM to quantity real world fuel consumption benefits are helpful and we anticipate they will encourage invention and introduction of new fuel saving technologies. One important class of fuel saving technologies to consider are those that are impossible to turn-off or disable because they are highly integrated into the system. Examples of these technology could be advanced combustion concepts, cam-less engines, variable compression ratio engines, air/hydraulic micro hybrids/launch assist devices, advanced transmissions, new aftertreatment concepts and other yet to be invented concepts. The proposed methods may not adequately cover demonstration of these technologies. As such, we encourage the agencies to consider other alternatives, such as an optional pathway that would allow manufacturers to demonstrate the off-cycle benefit by simply comparing the 5-cycle results to the 2-cycle results with the new technology operating, or perhaps using other analytical methods. We look forward to working with the agencies to develop these methodologies. [EPA-HQ-OAR-2010-0799-9463-A1, p. 18]

Organization: Motor & Equipment Manufacturers Association (MEMA)

Also, we support the agencies’ decision to remove the criteria initiated under the MY2012-2016 program (“new, innovative, not widespread use”) for the reasons stated in the NPRM. MEMA further supports the option to make eligible for credit those technologies that may only register small reductions on the 2-cycle test, but have more significant (and verifiable) off-cycle gains. MEMA also supports the agencies’ decision not to sunset the availability of these credits during the 2017-2025 timeframe for all of the same reasons stated in the NPRM. Again, overall MEMA is supportive of the direction the agencies are taking with respect to off-cycle credits. There are some key issue areas, however, where either changes or clarifications are needed; these are discussed below. [EPA-HQ-OAR-2010-0799-9478-A1, p.7]

MEMA further proposes any technology resulting in significant, quantifiable benefit off-cycle – regardless of 2-cycle benefit – should receive credit reflecting the real-world benefit of such technology. There will very likely be future technologies – in addition to Stop/Start and Active Aerodynamics – that could result in both significant on-cycle and off-cycle benefits. MEMA believes that these dual-benefit technologies should not be precluded from consideration. For example, if any of the technologies that are considered in setting the standard (in other words, baseline technologies for the Program), there could come a time when an on-cycle technology may evolve and provide a significant off-cycle benefit. Under this scenario, would EPA preclude it from consideration under their step-by-step approval process to be added to the approved list of technologies? MEMA recognizes the agency's concern about potential 'double counting.' However, we would point out that since off-cycle credits are recognized in the rule – and particularly if they were expanded to include any technology that has both on- and off-cycle benefit – then the potential unintended consequence of pushing "preferred technologies" and "winners and losers" diminishes somewhat. [EPA-HQ-OAR-2010-0799-9478-A1, pp.8-9]

Organization: Toyota Motor North America

Off-Cycle Credits: New Innovative Technology Criterion [EPA-HQ-OAR-2010-0799-9586-A1, p.10]

Toyota supports the agencies' decision to drop the requirement that off-cycle technologies must be new, innovative, or not wide spread. We agree that this requirement is confusing and has no relevance for technologies that deliver real world benefits regardless of when they are implemented or how prevalent they are in the fleet. For the same reason, we support the agencies' intent to clarify that the eligibility of approved technologies and credits generated will not sunset in the future. [EPA-HQ-OAR-2010-0799-9586-A1, p.10]

Response:

Commenters were supportive of EPA's proposal to eliminate the "new, innovative, and not in widespread use" as a criteria for eligibility for off-cycle credits, and EPA is finalizing these changes as proposed. Comments regarding potential off-cycle credits for integral technologies or 2-cycle technologies considered in establishing the standards are discussed in section III.C.5.b.ii of the preamble. EPA continues to believe that it would not be appropriate to provide off-cycle credits for integral technologies or technologies projected to be used to meet the 2-cycle standards, with the exception of stop-start and active aerodynamics which are on the pre-defined list and whose two cycle benefits were considered in determining the stringency of the standards.

Honda suggests that credits should be available for technologies installed at the dealership prior to initial sale. In response, only original equipment may be approved and eligible for credits as off-cycle credits are available only to OEMs. The manufacturer is responsible for the emissions performance of the vehicle and also all of the tracking to ensure that credit reporting to EPA is accurate. The standards and other program requirements apply to manufacturers and do not apply to dealerships or other (aftermarket) parties. Installations that might occur under some type of contractual arrangement with dealerships prior to the sale of the vehicle would not be transparent to EPA (i.e., EPA would not be monitoring these activities). EPA should note that there are a large number of aftermarket technologies that have a deleterious effect on fuel economy and end up in higher GHG emissions. These might include, remote starters, lights, powerful stereo systems, rooftop luggage racks and other devices that increase weight, aerodynamic, rolling, friction, or electrical load. By this reasoning, EPA might then consider taking credits away from manufacturers, for vehicles that have such technologies added. Clearly this becomes impractical.

However, the manufacturer is solely responsible for the accurate reporting of credits in the end of model year credit report. The manufacturer would need to be able to demonstrate, upon request from EPA, that the credits they are claiming are based on technology installed on the vehicles. This would likely be a much more straightforward proposition for the manufacturer if the technology is installed during vehicle assembly. The burden of proof falls solely on the manufacturer and EPA would expect manufacturers to be able to provide a detailed accounting of the vehicles on which they are claiming credits so that EPA could verify the validity of the credits. Credits that are claimed by the manufacturer and then later found not to be supported by evidence or found to be invalid could lead to noncompliance and enforcement action against the manufacturer.

8. A/C, Off-Cycle, and “Game Changing” Technology Fuel Consumption Improvement Values in CAFE Program

Organizations Included in this Section

Alliance of Automobile Manufacturers
Arkema Inc.
Association of Global Automakers, Inc. (Global Automakers)
Center for Biological Diversity
EcoMotors International, Inc.
Electric Drive Transportation Association
Environmental Defense Fund
Ferrari
Ford Motor Company
Johnson Controls, Inc.
Mazda North American Operations
Mercedes-Benz USA, LLC
Motor & Equipment Manufacturers Association (MEMA)
Porsche Cars North America, Inc. (PCNA)
Toyota Motor North America

Organization: Alliance of Automobile Manufacturers

CAFE Fuel Consumption Improvement Values for MAC Efficiency Improvements and Off-Cycle Technologies [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

In the GHG portion of the joint rulemaking, EPA is proposing to allow manufacturers to generate credits for improvements to MAC systems that reduce GHG emissions. EPA is also proposing to allow manufacturers to generate credits for implementing off-cycle technologies that result in real-world GHG reductions not fully accounted for under the existing test procedures. [EPA-HQ-OAR-2010-0799-9487-A1, p.12]

In the CAFE portion of the joint rulemaking, EPA, in coordination with NHTSA, is proposing to allow fuel consumption reductions (also called “fuel consumption improvement values”) equivalent to the GHG credits allowed by EPA. These would apply for the credit menus provided for MAC efficiency and the use of off-cycle technologies. The proposal makes it clear that in the CAFE program manufacturers would only get credit for improvements that lead to better real-world fuel economy; improvements that are aimed at other GHG reductions such as reducing or eliminating MAC refrigerant leakage are not tied to fuel economy and would not qualify for CAFE program incentives. The expected generation of these MAC credits is accounted for by both agencies in setting the level of the overall GHG and CAFE standards they propose, but the ability to generate off-cycle credits and fuel consumption reductions is not accounted for in the standards. The agencies seek comment on the proposals to allow manufacturers to estimate fuel consumption reductions from MAC improvements and off-cycle technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.13]

While the Alliance has some suggestions for modifying the details of the above-described proposals, we firmly believe that the proposals in general are both appropriate and necessary. As noted by the agencies in the preamble to the proposed rule, President Obama's Memorandum of May 21, 2010 requested that NHTSA and EPA work together to develop "...a coordinated national program under the [Clean Air Act] and the [Energy Independence and Security Act of 2007] to improve fuel efficiency and to reduce greenhouse gas emissions of passenger cars and light-duty trucks of model years 2017-2025.'9 As the President directed, and as all stakeholders recognize, a primary benefit of the single National Program approach is that it provides for harmonized EPA and NHTSA regulations so that manufacturers can build one fleet of vehicles that complies with both sets of rules. In keeping with that directive, it is important for EPA and NHTSA to include common provisions in both sets of rules to the maximum extent possible. [EPA-HQ-OAR-2010-0799-9487-A1, p.13]

The Alliance has already expressed its support for the inclusion of provisions allowing for MAC credits and off-cycle credits in the context of EPA's GHG rules, and we have explained why the inclusion of such provisions will further the goals of the program. In the interests of promoting harmonization, it only makes sense for the agencies to include comparable provisions in the CAFE rules. This applies to MAC and off-cycle improvements, as well as to the implementation of "game changing-technologies" in full-size pickup trucks and other credits. Failure to do so would only lead to increased disparities between the rules, giving rise to the possibility that manufacturers would need to undertake different actions to comply with the GHG rule on one hand, and the CAFE rule on the other. Of course, in developing these provisions, the agencies must be mindful of differences in the statutes underlying the two regulatory programs. Here, the agencies are being careful to ensure that the CAFE adjustments are limited to the demonstrated fuel economy benefits of the MAC and off-cycle improvements, which is entirely appropriate given the scope of the CAFE program. [EPA-HQ-OAR-2010-0799-9487-A1, p.13]

In light of the above, the Alliance believes that the agencies should proceed to include provisions accounting for the fuel economy benefits of MAC improvements and off-cycle technologies in the CAFE program, providing equivalent fuel consumption and CO_2 credit values toward both the GHG and CAFE programs. This step will help to further harmonize one of the many remaining differences between the two regulations. [EPA-HQ-OAR-2010-0799-9487-A1, p.14]

Organization: Arkema Inc.

The NPRM currently provides an opportunity for auto manufacturers to receive consumption improvement values for air conditioning efficiency and off-cycle technologies. [EPA-HQ-OAR-2010-0799-9468-A1, p.3]

Organization: Association of Global Automakers, Inc. (Global Automakers)

These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 51.]

We urge the agencies to consider two factors in developing compliance incentives under the GHG and CAFE standards. First, it is important that the agencies harmonize flexibility mechanisms between the GHG and CAFE programs to the maximum possible extent, consistent with the goals of the National Program. This principle of harmonization does not apply, however, to the measurement of GHG emissions that are not efficiency-related, such as air conditioning refrigerant leakage. [EPA-HQ-OAR-2010-0799-9466-A1, p.2]

Organization: EcoMotors International, Inc.

EPA is proposing CO_2 credits for manufacturers that hybridize a significant quantity of their full-size pickup trucks, and the agencies are also proposing that manufacturers be able to include 'fuel consumption improvement values' equivalent to EPA CO_2 credits in the CAFE program. Access to the incentives is conditioned on a minimum penetration of mild and strong hybrid electric vehicle (HEV) technologies in an OEM's full-size pickup truck fleet. [This comment can also be found in section 5 of this comment summary.] [EPA-HQ-OAR-2010-0799-9594-A2, p. 8]

Organization: Electric Drive Transportation Association

Third, EDTA opposes NHTSA's determination that it lacks authority to include a multiplier as part of its CAFE standards under EPCA and EISA. While these statutes do provide for certain incentives, they do not preclude NHTSA from establishing additional incentives, such as a multiplier. Adoption of a multiplier in NHTSA's rule would promote the fundamental policy of developing a harmonized national system in which EPA and NHTSA establish consistent regulatory requirements. [EPA-HQ-OAR-2010-0799-9449-A1, p. 2]

Organization: Environmental Defense Fund

C. Constraints on NHTSA's Authority

In contrast to EPA's expansive authority under Section 202 of the Clean Air Act, EPCA as amended by EISA includes limitations on NHTSA's authority to regulate fuel economy. NHTSA's authority is focused on fuel economy and not air pollution, and as a result, NHTSA is constrained in regulating direct discharges of N20, CH4, and HFC emissions from automobiles. 76 Fed. Reg. at 74,902. [EPA-HQ-OAR-2010-0799-9519-A1, p. 6]

Within its focus on fuel economy, EPCA contains additional, limitations on NHTSA's discretion to establish CAFE standards including the nexus to fuel efficiency. And, of particular importance, any proposed expansion of NHTSA's fuel economy analysis must be consistent with EPA's statutorily-mandated procedures to test fuel economy. [EPA-HQ-OAR-2010-0799-9519-A1, p. 6]

EPCA directs the Secretary of Transportation to prescribe CAFE standards, which "shall be the maximum feasible average fuel economy level that the Secretary decides the manufacturers can achieve in that model year." 49 U.S.C. § 32902; see also § 32902(f) (directing the Secretary to consider statutorily-enumerated factors in making this determination). While NHTSA has discretion in standard setting, under EPCA, EPA alone has the authority to measure fuel economy and to calculate CAFE values, 49 U.S.C. § 32904(a). In doing so, EPA "shall use the same procedures for passenger automobiles the Administrator used for model year 1975 . . . or procedures that give comparable results." Id. at 32904(c). The D.C. Circuit has concluded that, to produce "comparable results," "[t]he critical fact is that a procedure . . . was available for MY1975 testing, and those manufacturers, however few in number, that found it advantageous to do so, employed that procedure." Center for Auto Safety v. EPA, 806 F.2d 1071, 1077 (D.C. Cir. 1986). [EPA-HQ-OAR-2010-0799-9519-A1, p. 6]

In a previous rulemaking, the agencies concluded that this statutory structure did not allow for incorporation of air-conditioning efficiency improvement and off-cycle technology credits into NHTSA's fuel economy analysis. 75 Fed. Reg. at 25,544 ("The CAFE standards and compliance testing cannot capture all of the real world CO2 emissions, because EPCA currently requires EPA to use the 1975 passenger car test procedures under which vehicle air conditioners are not turned on during fuel economy testing."); 25,663 (requesting comment on including air conditioning credits in light-truck testing requirements but emphasizing "that modernizing the passenger car test procedures as well would not be possible under EPCA as currently written."). [EPA-HQ-OAR-2010-0799-9519-A1, p. 6]

In this proposal, however, the agencies forward different legal rationales, id. at 74,998, which they characterize as "major changes" from past practice, id., that would allow them to incorporate air-conditioning efficiency and off-cycle technology improvements into NHTSA standard setting. Both the agencies themselves, supra, and regulated industry have raised questions regarding this conclusion. See EPA Doc. No. OAR-2009- 0472-7123.1 at 17 (Comments of Association of International Automakers on LDV Phase I) (noting that the Association "does not support fundamentally changing the fuel economy/greenhouse gas test procedures at this time"); see also EPA Doc. No. EPA-HQOAR- 2003-0214-0208 at 10 (Comments of the Alliance of Automobile Manufacturers) (noting that any change in test procedures would require EPA "to develop a complex set of test procedure adjustment factors to ensure that the new procedures 'give comparable results' to the existing ones"). [EPA-HQ-OAR-2010-0799-9519-A1, pp. 6-7]

Organization: Ferrari

Ferrari strongly supports the proposal to allow manufacturers to generate fuel consumption improvement values for purposes of CAFE compliance based on the use of A/C efficiency technologies. [EPA-HQ-OAR-2010-0799-9535-A2, p.13]

Finally, we support to allow these credits to be counted for the CAFE compliance calculations. [EPA-HQ-OAR-2010-0799-9535-A2, p.14]

Ferrari appreciates the proposal to gain credits for high efficiency A/C systems and offcycle technologies to be used for fuel consumption improvement and CAFE compliance. [EPA-HQ-OAR-2010-0799-9535-A2, p.15]

Organization: Ford Motor Company

In order to provide equivalent fuel consumption benefits for these fuel saving technologies, Ford also supports the inclusion of off-cycle credits as part of the NHTSA CAFE program. This allowance helps to coordinate the EPA and NHTSA programs in the efforts of harmonization. [EPA-HQ-OAR-2010-0799-9463-A1, p. 18]

NHTSA Incentives for Electric Vehicles, Plug-in Hybrids, and Fuel Cell Vehicles

NHTSA has also expressed the view that it lacks authority to establish an incentive multiplier for EVs, PHEVs, and FCVs, comparable to the one proposed by EPA, in the fuel economy regulations under EPCA and EISA. In this case, we disagree with NHTSA's interpretation of EPCA and EISA. In our view, the law does not address this issue, either directly or indirectly. Moreover, the President has directed EPA and NHTSA to coordinate and harmonize their regulations as much as possible. Consistent with that directive, the agencies should interpret statutes so as to optimize the degree of harmonization between the GHG program and the CAFE program. Thus, if one agency incorporates a program flexibility into its rules, the other agency should adopted a corresponding program flexibility unless expressly prohibited by law. We refer the agencies to the comments of EDTA on this point, which we support and incorporate by reference. [EPA-HQ-OAR-2010-0799-9463-A1, p. 21]

Organization: Johnson Controls, Inc.

Specifically, we support the inclusion of fuel consumption reductions resulting from air conditioning improvements and the application of off-cycle credits and equivalent fuel consumption improvements in NHTSA's CAFE compliance calculations. [NHTSA-2010-0131-0253-A1, p. 2]

Organization: Mazda North American Operations

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 63-64.]

Additionally, we support providing equivalent fuel consumption and CO_2 credit values towards both the greenhouse gas and CAFE programs, helping to further harmonize one of the many remaining differences between the two regulations.

Organization: Mercedes-Benz USA, LLC

DAG also supports the agencies' decision to provide the analogous fuel consumption improvement credits within the CAFE program.[4] As set forth in DAG's comments to the MY 2012-2016 rulemaking, EPA has broad discretion to determine how to calculate fuel economy for purposes of the CAFE program and should utilize that discretion as necessary to harmonize the CAFE and GHG programs. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-2]

Organization: Motor & Equipment Manufacturers Association (MEMA)

Specifically, we support the agencies' decision to parallel the efficiency credits and fuel consumption improvement values for compliance calculations for their respective GHG emissions and CAFE standards programs (for example, the air conditioning and off-cycle emissions improvements and its equivalent fuel consumption improvement). [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

Particularly, MEMA supports the agencies proposal to align EPA credits with NHTSA's CAFE compliance by allowing manufacturers to generate fuel consumption improvement values for air conditioning (A/C) technologies and off-cycle technologies. These technologies are not otherwise "captured" on traditional test cycles, but they still provide contributing real-world benefits that improve vehicle efficiencies. Therefore, rewarding various A/C and innovative off-cycle technologies under both components of the rule will encourage faster adoption and increase deployment into the fleet. [EPA-HQ-OAR-2010-0799-9478-A1, p.5]

In the NPRM, Tables II-11, II-18 and IV-117 show a 0.000778 gal/mi consumption improvement value for engine heat recovery. We believe the agencies actually intended this to be a value of 0.0000788 as stated in the Technical Support Document on Table 5-26, page 5-75, where it was rounded up to 0.000079. [EPA-HQ-OAR-2010-0799-9478-A1, p.12]

Organization: Porsche Cars North America, Inc. (PCNA)

It is widely understood that GHG improvements are equivalent to fuel economy improvements. Therefore, we believe it is appropriate to extend all credit provisions in the GHG program to equivalent credit in the CAFE program. This additional CAFE credit would also provide additional incentive for further advances in efficiency improvement. [EPA-HQ-OAR-2010-0799-9264-A1, p. 6]

Organization: Toyota Motor North America

The agencies have proposed significant changes to EPA's existing off-cycle credit regulations. First, NHTSA has proposed to adopt off-cycle credits for the 2017-2025 model years. While EPA will continue to administer the program, NHTSA has proposed to award a corresponding level of CAFE credit for any EPA-approved off-cycle technologies. Toyota supports NHTSA's proposed adoption of off-cycle credits as a necessary step towards further harmonizing the federal regulations. [EPA-HQ-OAR-2010-0799-9586-A1, p.10]

Response:

EPA received several comments supporting EPA's inclusion of fuel economy improvement values under CAFE testing and calculations procedures that are equivalent to EPA credits for A/C efficiency improvements, off-cycle, and full-size pick-ups. Commenters note that these provisions help to further harmonize the programs. EPA is finalizing fuel consumption improvement value approach under its EPCA authority as proposed. This is discussed in more detail in section III.B.10 of the preamble. EPA appreciates MEMA comments noting an error for one of the fuel consumption improvement values in the proposal and EPA has corrected this error.

Regarding Porsche comments that all GHG credits have a corresponding fuel consumption improvement and should receive equivalent credits under CAFE, EPA disagrees. A/C credits based on reduced refrigerant leakage and alternative refrigerant use are based on reducing HFCs rather than CO_2 and therefore do not have a corresponding fuel consumption improvement. With regard to incentives under CAFE for EVs, PHEVs, and FCVs, this involves NHTSA's interpretation of its authority under EPCA/EISA. As noted in the NPRM (see 76 FR 74878) and discussed in NHTSA's Preamble Section IV addresses this, NHTSA currently interprets EPCA and EISA as precluding the agency from offering additional incentives for these vehicles except as specified by statute.

9. Certification, Compliance, and Enforcement

Organizations Included in this Section

Ford Motor Company

Organization: Ford Motor Company

We support NHTSA's efforts to receive and retain CAFE projections and related data in electronic format. We recommend that NHTSA does not create a new database with new requirements, but rather NHTSA should use a database format the same as EPA's Verify system. Manufacturers have spent significant time and money updating our databases to conform to EPA's new requirements commencing with the 2009 MY. (76 Fed. Reg. 75340) [EPA-HQ-OAR-2010-0799-9463-A1, p. 25]

In fact, the government of Canada is creating a new database for their new GHG requirements, and their system will be based on EPA's Verify format rather than retaining their current online xml reporting system. Their previous fuel consumption database is being converted over to the new Verify like format, recognizing the need for consistency among systems. [EPA-HQ-OAR-2010-0799-9463-A1, p. 26]

There are no GHG reductions or benefits to be gained by manufacturers spending time and resources reformatting complex data. An important aspect of a single, harmonized fuel economy and greenhouse gas program is communized reporting formats. [EPA-HQ-OAR-2010-0799-9463-A1, p. 26]

We support NHTSA's proposal to move to all electronic reporting. We support emailing data in Excel format as long as current manufacturer format is acceptable, and support moving to xml as long as Verify format is followed (76 Fed. Reg. 75350). [EPA-HQ-OAR-2010-0799-9463-A1, p. 26]

We do not support NHTSA's proposed change to 49 CFR § 537.7(c)(4) which moves credit reporting to a configuration level. For example, air conditioning efficiency credits are not going to vary by fuel economy configuration (basic engine / transmission class / IWC / transmission configuration / axle ratio / calibration); they may only vary by vehicle line. This type of vehicle characteristic should not be attempted as an overlay on a very specific fuel economy structure. Manufacturers should be allowed to delineate the credit applicability specifically, as needed, but for cases where credits apply across a much broader section of vehicles, manufacturers should be allowed to report on that level. EPA has already developed a credit spreadsheet for tracking credits and volumes that provides for accurate credit reporting. This spreadsheet should be allowed by NHTSA as well. In the future, should EPA move credit reporting to their Verify database, NHTSA's reporting requirements should be flexible enough to allow manufacturers to fulfill data and formatting requirements for both agencies simultaneously. (76 Fed. Reg. 75351-2) [EPA-HQ-OAR-2010-0799-9463-A1, p. 26]

Similarly, for 49 CFR § 537.7(c)(5) requesting light truck classification data, we support NHTSA's desire to consolidate all truck classification data to one location. We do note that requiring cargo-carrying volumes in the truck classification section (5) and also in the configuration information (4) is duplicitous. Requiring the same data in multiple places is either wasteful or inviting error. We also suggest that this overload of data actually makes it more difficult for NHTSA to use manufacturers' reports due to the unnecessary complexity and added length. We recommend that NHTSA's reporting regulations allow manufacturers to streamline reporting, as long as all the data required to confirm CAFE calculations, fleet classification, and NHTSA's fleet analyses are present and easily identified. [EPA-HQ-OAR-2010-0799-9463-A1, p. 26]

Response:

These comments are directed at the NHTSA program, and as such do not require a response from EPA.

9.1. Base Tire Definition

Organizations Included in this Section

Alliance of Automobile Manufacturers
Association of Global Automakers, Inc. (Global Automakers)
Ford Motor Company
General Motors Company
Hyundai America Technical Center
Toyota Motor North America

Organization: Alliance of Automobile Manufacturers

Base Tire Definition [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

EPA invites comment on whether changes to the base tire definition are warranted to "ensure a more uniform application across manufacturers." The Alliance recommends that changes to the definition of base tire be deferred. [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

In 40 C.F.R. §600.002, EPA currently defines base tire as follows: [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

Base tire means the tire specified as standard equipment by the manufacturer. [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

In 49 C.F.R. §523.2, NHTSA currently defines base tire as follows: [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

Base tire for passenger automobiles, light trucks and medium-duty passenger vehicles means the tire specified as standard equipment by a manufacturer on each vehicle configuration of a model type. [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

Although EPA has not proposed specific language to replace its definition, NHTSA has proposed to change its definition to the following: [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

Base tire (for passenger automobiles, light trucks and medium duty passenger vehicles) means the tire that has the highest production sales volume that is installed by the vehicle manufacturer on each vehicle configuration of a model type. [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

The Alliance does not support the proposed change to the NHTSA definition of base tire. NHTSA's proposed definition of base tire ties the footprint to high sales points within the fuel economy hierarchy. This can and does change throughout the model year based on many factors beyond a manufacturer's control or foresight. EPA's definition allows manufacturers to retain the direct link between footprint and the physical dimensions of the vehicles. All vehicles should be included in the fleet average using a representative footprint based on the physical vehicle, not a footprint based on a moving target of sales. [EPA-HQ-OAR-2010-0799-9487-A1, p.83]

Additionally, NHTSA's current definition lends to the confusion by overlaying footprint on the fuel economy hierarchy through the inclusion of the defined fuel economy term 'configuration' in the base tire definition. Footprint is a function of the vehicle's dimensions. This is not related to any fuel economy 'configuration.' The footprint fuel economy target is simply a function of the production volume and its associated footprint. [EPA-HQ-OAR-2010-0799-9487-A1, p.84]

Under the current regulations, the base tire definition has a direct effect on footprint values and footprint has a direct effect on a manufacturer's targets. Therefore, any changes to the definition of base tire will have an effect on the stringency of a manufacturer's CAFE and CO_2 targets. This effect may vary from manufacturer to manufacturer. Nevertheless, each manufacturer has analyzed many scenarios and made long-range projections regarding its own ability to meet CAFE and CO_2 standards within a product segment. All of these projections have assumed that the base tire and footprint definitions would remain the same and would continue into the future. To change any of these definitions at this point in time would render any previous analyses regarding projected CAFE and GHG capabilities null and void. [EPA-HQ-OAR-2010-0799-9487-A1, p.84]

Therefore, we recommend that changes to any fundamental definitions that could effectively increase the stringency of the GHG and CAFE standards be deferred to a separate, future rulemaking and that both agencies engage in a joint dialogue with automakers to understand the complex technical issues involved. Further, any fundamental changes that could potentially increase the stringency of the standards should not be applied retroactively to past model years and should only go into effect starting with a future model year. Finally, in order to avoid future confusion and misinterpretation, we suggest that EPA and NHTSA endeavor to maintain identical definitions wherever possible. [EPA-HQ-OAR-2010-0799-9487-A1, p.84]

Organization: Association of Global Automakers, Inc. (Global Automakers)

NHTSA also invites comment on its proposed modification to its definition of “base tire,” which affects the determination of footprint size in determining compliance with standards. This change is proposed due to NHTSA’s concern that the current definition lacks specificity, leading to differing interpretations by manufacturers. Global Automakers supports clarification of the definition. We also urge that NHTSA and EPA adopt the same definitions of “base tire,” in order to increase the harmonization of standards under the national standards program. [EPA-HQ-OAR-2010-0799-9466-A1, p. 9]

Organization: Ford Motor Company

Base Tire

Ford does not support the proposed change to the NHTSA definition of base tire. We believe that NHTSA's current definition lends to the confusion by overlaying footprint on the fuel economy hierarchy through the inclusion of the defined fuel economy term 'configuration' in the base tire definition. Footprint is a function of the vehicle's dimensions. This is not related to any fuel economy 'configuration'. The footprint fuel economy target is simply a function of the production volume and its associated footprint. We recommend that NHTSA adopt EPA’s definition, and hence help maintain the development of a One National Program moving forward. [EPA-HQ-OAR-2010-0799-9463-A1, p. 25]

Organization: General Motors Company

GM supports further analysis and discussion with industry, EPA and NHTSA, regarding the complex task of defining “base tire”. We recommend that changes to the definition of base tire be deferred – and taken up potentially as part of one of the mid-term review “check-ins” - to minimize the potential for unnecessary complications and unintended consequences. [EPA-HQ-OAR-2010-0799-9465-A1, p. 4]

Organization: Hyundai America Technical Center

Base Tire Definition [EPA-HQ-OAR-2010-0799-9547-A1, p.7]

The agencies have asked whether the definition of base tire should be revised. We agree that there should be a definition which would require all automakers to consistently calculate their vehicle footprints. NHTSA has proposed the definition of 'tire installed by the vehicle manufacturer that is used on the highest production sales volume of vehicles within the configuration'. We agree that the tires installed on the vehicle most commonly sold within a vehicle configuration should become the basis for setting a manufacturer's fuel economy standards. This is a fair and a workable definition. [EPA-HQ-OAR-2010-0799-9547-A1, p.7]

Organization: Toyota Motor North America

Base Tire Definition [EPA-HQ-OAR-2010-0799-9586-A1, p.21]

Under existing and proposed attribute standards, base tire is used to define vehicle footprint, which in turn determines a vehicle's fuel economy and CO_2 targets. Existing EPA and NHTSA definitions of base tire are similar, but differ in their level of specificity.[5] In the preamble for the 2017-2025 model year proposal, NHTSA expresses concern that the current definition of base tire is insufficiently descriptive and open to interpretation. In response, NHTSA has proposed redefining base tire to be the tire with highest sales within a vehicle configuration. EPA requests comment on whether changes to the EPA base tire definition are warranted to 'ensure a more uniform application across manufacturers', but does not propose a revised definition. [EPA-HQ-OAR-2010-0799-9586-A1, p.21]

Toyota shares the concern that different interpretations of base tire could potentially lead to different calculated attribute targets for the different vehicles that otherwise should have the same attribute targets. This could create an un-level playing field among manufacturers. Any change in definitions that affects vehicle footprint has the potential to impact the stringency of the standards. The magnitude of that impact is currently unknown and could vary by manufacturer. However, we do not believe enough analysis has been performed to date to suggest exactly how the definition should be revised. Further, the comment period for this rulemaking does not provide adequate time to carefully explore alternatives to address the agencies' concerns. [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

As a result, Toyota requests that NHTSA and EPA study this issue further and take appropriate action in a future rulemaking to clarify this issue. Any change in regulatory definitions should be adopted by both agencies to further the objective of regulatory harmonization. [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

---

5 - NHTSA currently defines base tire as the tire specified as standard equipment by a manufacturer on each vehicle configuration of a model type (49 C.F.R. §600.2). EPA defines base tire as the tire specified as standard equipment by the manufacturer (49 C.F.R. §523.2). [EPA-HQ-OAR-2010-0799-9586-A1, p.21]

<u>Response:</u>

One of the factors in a manufacturer's calculation of vehicle footprint is the base tire. Footprint is based on a vehicle's wheel base and track width, and track width in turn is "the lateral distance between the centerlines of the base tires at ground, including the camber angle."[17] EPA's current definition of base tire is the "tire specified as standard equipment by the manufacturer."[18] NHTSA proposed a specific change to the base tire definition for the CAFE program (see Section IV.I.5.g, and proposed 49 CFR 523.2), and EPA requested comment on

[17] See 40 CFR 86.1803-01

[18] See 40 CFR 86.1803-01, and 40 CFR 600.002. Standard equipment means those features or equipment which are marketed on a vehicle over which the purchaser can exercise no choice.

whether the base tire definition should be clarified to ensure a more uniform application across manufacturers (76 FR 75088, December 1, 2011).

Vehicle manufacturers were the only parties providing comments on this issue, and they were essentially unanimous in stating a desire for a level playing field, while reiterating that the issue is complex. Several manufacturers pointed out that the proposed NHTSA definition, which includes a connection to a vehicle configuration, may not be workable because the definition of a configuration is independent of vehicle size, or footprint. Several manufacturers suggested that EPA, NHTSA, and the auto companies should postpone action on this issue in this rule and work together to ensure a consistent and complete understanding of the issue. Others agreed that the definition could benefit from some clarification. After consideration of the comments, and a recognition of the importance that the footprint calculation (and therefore all the elements that comprise the footprint calculation) be harmonized across EPA and NHTSA, EPA is finalizing a revised definition in this final rule, which is consistent with the definition being finalized by NHTSA. The revised definition is as follows:

> *Base tire* means the tire size specified as standard equipment by the manufacturer on each unique combination of a vehicle's footprint and model type. Standard equipment is defined in 40 CFR 86.1803-01.

This definition appropriately removes the link to vehicle configuration that was in NHTSA's proposal, and improves upon EPA's existing definition with additional specificity that is consistent with the goal of a footprint-based program, which, as stated by the Alliance of Automobile Manufacturers, is that "All vehicles should be included…using a representative footprint based on the physical vehicle…" EPA agrees with this broadly stated goal, and we believe that the revised definition offers reasonable clarification that should help ensure a consistent application of the footprint-based standards across manufacturers. This new definition, which is harmonized with the definition being finalized by NHTSA, is also consistent with existing regulatory language that specifies how EPA intends that footprint-based standards be implemented. For example, EPA regulations currently state that "Each CO_2 target value, which represents a unique combination of model type and footprint value, shall be multiplied by the total production of that model type/footprint combination for the appropriate model year" (see 40 CFR 86.1818-12(c)(2)).

9.2. Car-Truck Definitions

Organizations Included in this Section

Alliance of Automobile Manufacturers
Association of Global Automakers, Inc. (Global Automakers)
Ford Motor Company
Toyota Motor North America
Union of Concerned Scientists (UCS)

Organization: Alliance of Automobile Manufacturers

The agencies must maintain the current car and truck vehicle classification framework. The standards (i.e., footprint curves) that have been established, and the goals that have been placed are all based upon the current and known set of harmonized definitions. Any changes to the definitions during MYs 2017-2025 necessarily would require a reevaluation of the appropriate level of stringency, cost, necessary flexibilities and final standards for any and all years in which a change would apply. [EPA-HQ-OAR-2010-0799-9487-A1, p.4]

The Agencies Must Maintain the Current Car and Truck Vehicle Classification Framework. [EPA-HQ-OAR-2010-0799-9487-A1, p.8]

In section IV.H. of the NPRM, NHTSA discusses the existing regulations governing the classification of cars and trucks. The agency states, “NHTSA continues to believe that the definitions as they currently exist are consistent with the text of [the Energy Independence and Security Act of 2007 (EISA)] and with Congress' original intent.'8 Nevertheless, NHTSA requests comment on the possibility of changing the vehicle classification definitions, citing the long time frame of the rulemaking. [EPA-HQ-OAR-2010-0799-9487-A1, p.8]

First, we agree with NHTSA’s assessment that the existing definitions for classifying vehicles are consistent with EISA and the original intent of Congress in EPCA. In past rulemakings, NHTSA has made some adjustments to the classification rules and clarified its interpretation of certain aspects of the rules. These efforts have accomplished their intended objectives by clearing up ambiguities and leveling the playing field. The Alliance is not aware of any further systemic problems with respect to the interpretation of the rules, and we do not believe any further changes need to be made. [EPA-HQ-OAR-2010-0799-9487-A1, p.8]

NHTSA requests comment on whether the current definitions might create an incentive to manufacturers to “game” vehicle designs in a way that would reduce potential fuel savings in the future. We consider this risk to be minimal because vehicle designs are evaluated primarily based upon an assessment of consumer acceptance. In other words, the key issue for manufacturers is whether potential purchasers would find the design useful and appealing, not how the vehicle would be classified under various regulatory programs. Moreover, the advent of 'Reformed CAFE' has reduced the incentives for manufacturers to attempt to reclassify vehicles from one fleet to another, given the fact that even larger vehicles can be 'CAFE-positive' based on their status relative to their footprint target. Finally, the existing definitions simply do not lend themselves to gamesmanship, a testament to NHTSA's efforts over the years to improve and refine the classification rules. [EPA-HQ-OAR-2010-0799-9487-A1, p.9]

Having developed a robust set of classification rules, NHTSA's priority should be preserving the stability of those rules, rather than engaging in continual modification and experimentation. Changes to the classification rules could have unintended consequences. For example, they could create new ambiguities or open up new opportunities for gamesmanship. If the changes are overly restrictive, they could have the effect of discouraging the production of vehicles that American consumers want to buy. [EPA-HQ-OAR-2010-0799-9487-A1, p.9]

A decision to change the classification rules at this point would create other problems. The classification rules represent a fundamental building block of the single National Program, and any attempt to change the car/truck definitions would have far-reaching consequences. All of the analyses of the proposed standards that manufacturers have conducted to date have been based on the assumption that the existing car/truck definitions would be retained. If the definitions applicable to MYs 2017-2025 were changed, it would require a complete reevaluation of virtually all other aspects of the proposed rules, including the stringency of the standards, the cost of compliance and the adequacy of the program flexibilities. Such a reevaluation would be essential because, as a practical matter, a change to the classification definitions can be equivalent to a major change to the standards themselves. An amendment to the car/truck definitions could easily mean the difference between compliance and non-compliance for many manufacturers. Therefore, amendments to the classification rules would necessitate a brand new, top-to-bottom reanalysis of the standards by all manufacturers as well as NHTSA and EPA. And it is highly probable that large portions of the rulemaking package would need significant readjustment as a result of that exercise. [EPA-HQ-OAR-2010-0799-9487-A1, p.9

In light of the above, the agencies must maintain the current car and truck vehicle classification framework. The standards (i.e., footprint curves) that have been established and the goals that have been placed are all based upon the current and known set of harmonized definitions. Any changes to the definitions during MYs MY 2017-2025 necessarily would require a reevaluation of the appropriate level of stringency, cost, necessary flexibilities and final standards for any and all years that a change would apply. [EPA-HQ-OAR-2010-0799-9487-A1, p.9]

Organization: Association of Global Automakers, Inc. (Global Automakers)

NHTSA invites comment on the reclassification of vehicles with a third row of seats that are currently classified as light trucks under NHTSA regulations in title 49 U.S.C. 523.5(a). Global Automakers agrees with NHTSA's conclusion that there would be no clear energy savings benefit from reclassifying these vehicles to be passenger automobiles, and we urge the agency to maintain the current classification system. Shifting these vehicles into the passenger automobile category would likely necessitate changes to the auto standards to make the standards less stringent to accommodate these vehicles, potentially reducing fuel savings. Such a shift would also impose significant compliance costs on manufacturers as the stringency of both the auto and truck standards would change. We also reject the argument presented in the proposal that the third row of seats is installed in some crossover vehicles as a gaming strategy, in order to shift vehicles into the truck category. There are substantial cost and weight penalties associated with the addition of third row seats, so installing these seats cannot be justified in the absence of consumer demand for them. [EPA-HQ-OAR-2010-0799-9466-A1, pp.8-9]

Organization: Ford Motor Company

Clarification of the Interpretation of 'Running Clearance'

As explained in more detail in the Alliance comments, NHTSA should not change the existing framework for vehicle classification. However, NHTSA could assist light truck manufacturers in the production of more fuel-efficient light trucks by providing a small clarification with respect to the minimum running clearance criterion applicable to vehicles classified as light trucks by virtue of their off-highway capability. [EPA-HQ-OAR-2010-0799-9463-A1, p.28]

Many SUVs and some crossover vehicles are classified as light trucks because they are 'capable of off-highway operation' as defined in 49 CFR § 523.5(b). Such vehicles need either have 4-wheel drive or be over 6,000 pounds GVWR, and they need to meet four out of five dimensional criteria. One of the five criteria is a running clearance of 20 cm; the others relate to approach angle, breakover angle, departure angle, and axle clearance. The key terms used in § 523.5(b) are defined in 49 CFR § 523.2. 'Running clearance' is defined as 'the distance from the surface on which an automobile is standing to the lowest point on the automobile, excluding unsprung weight.' [EPA-HQ-OAR-2010-0799-9463-A1, p.28]

Our concern has to do with the interpretation of the running clearance criterion, and its effect on our efforts to make our light trucks as fuel-efficient as possible. As a motor vehicle is driven down the highway, the movement of air past the wheels and tires contributes to the aerodynamic drag of the vehicle, tending to reduce fuel economy. This aerodynamic drag can be reduced by the installation of flexible plastic components in front of the tire and wheel. Ford calls these components tire aero deflectors. They help to deflect oncoming air around the tire/wheel assembly, reducing aerodynamic drag and improving fuel economy. The fuel economy benefit of tire aero deflectors is primarily apparent in real-world highway driving. [EPA-HQ-OAR-2010-0799-9463-A1, p.28]

The optimal design of a tire aero deflector can vary from vehicle to vehicle, depending on the vehicle's design. For some vehicles, the bottom edge of the deflector may need to be less than 20 cm from the ground (when the vehicle is parked on a flat surface) in order to provide the desired deflection of air around the wheels and tires. This raises the issue: if a vehicle that a manufacturer intends to classify as a light truck needs to meet the running clearance criterion in order to meet the '4-out-of-5' requirement in 49 CFR § 523.5(b)(2); and if the manufacturer wishes to install a tire aero deflector that hangs below the 20 cm running clearance line; should the installation of such a component prevent the vehicle from being classified as a light truck? Another manufacturer raised a similar issue in its comments on the MY 2012-2016 rules. In response, NHTSA indicated that it needed further information and would defer consideration of the issue to another time. (75 Fed. Reg 25662) [EPA-HQ-OAR-2010-0799-9463-A1, pp.28-29]

As noted previously, the optimal design for a tire aero deflector may be such that the bottom of the deflector may be less than 20 cm away from the road surface. A tire aero deflector is not connected to the vehicle's suspension, so it is not considered 'unsprung weight.' Therefore, under a literal reading of the rule, a tire aero deflector whose bottom edge is less than 20 cm from the road surface might be considered to infringe upon the 20 cm running clearance criterion. If the rule is interpreted in this fashion, it would mean that if a manufacturer installs tire aero deflectors on a vehicle that does not meet the approach angle criterion of 28 degrees, the manufacturer would be compelled to reclassify the vehicle as a passenger car because the vehicle would not be able to meet four of the five dimensional criteria specified 49 CFR 523.5(b). [EPA-HQ-OAR-2010-0799-9463-A1, p.29]

In reality, if tire aero deflectors whose bottom edge is less than 20 cm from the road surface are considered to violate the running clearance criterion, manufacturers simply will not install them on the affected light trucks. Typically, whatever fuel economy benefit the deflectors may provide will be outweighed by the disadvantages to the manufacturer of reclassifying the vehicle as a passenger car. Reclassifying the vehicle as a passenger car would mean that the vehicle would become subject to the passenger car 'curve,' resulting in a more stringent fuel economy and GHG 'target' for the vehicle. This could have the effect of hurting the manufacturer's ability to meet both the car standards and the truck standards for a given model year. As a result, manufacturers will leave the tire aero deflectors off of the vehicles, and the classification rules would end up discouraging manufacturers from installing components that help to improve real-world fuel efficiency. [EPA-HQ-OAR-2010-0799-9463-A1, p.29]

One might suggest that the interpretation issue can be avoided if the manufacturer simply concedes the running clearance criterion and plans to meet the other four dimensional criteria in 49 CFR 523.5(b). However, it is not that simple in the real world, particularly for vehicle manufacturers concerned with producing fuel-efficient products. One of the other five criteria for 'off-highway capable' truck classification is an approach angle of not less than 28 degrees. Many SUVs and crossovers built today do not meet this criterion. An approach angle of 28 degrees means that a vehicle will have a high front fascia. In general, a high front fascia tends to create more aerodynamic drag, which is not conducive to better fuel economy and reduced GHG emissions. A lower front fascia allows a vehicle to have better aerodynamic characteristics. In this era of increasingly stringent CAFE and GHG standards, many manufacturers, including Ford, disfavor vehicle designs that would feature a high front fascia. If a manufacturer elects to design a SUV or crossover with a lower front fascia for better fuel economy, it must then plan to meet all of the remaining four dimensional criteria for off-highway capability in 49 CFR 523.5(b)(2) in order to classify the vehicle as a light truck. This means that the vehicle would need to have a running clearance of at least 20 cm. [EPA-HQ-OAR-2010-0799-9463-A1, p.29]

Ford designs its tire aero deflectors to be flexible enough to bend without breaking when encountering a 20 cm high solid object at relatively low speeds (i.e., off-road driving speeds). In our view, this is fully consistent with the spirit and intent of the off-highway-capable criteria. In other words, even with the deflectors present, our customers would continue to be able to engage in the same kinds of off-highway driving envisioned by the current rules, without damaging their vehicles. [EPA-HQ-OAR-2010-0799-9463-A1, pp.29-30]

In light of the above, we believe that NHTSA can promote improved fuel economy and reduced GHG emissions, without compromising other objectives, by issuing an interpretation clarifying that the installation of flexible tire aero deflectors whose bottom edge is less than 20 cm from the road surface would not compromise compliance with the running clearance criterion in 49 CFR 523.5(b)(2). We therefore requests that in the final rule, NHTSA either provide a regulatory interpretation in the preamble to the rule, or modify the regulatory language in 49 CFR Part 523, to provide the following clarification: [EPA-HQ-OAR-2010-0799-9463-A1, p.30]

A flexible component (or components) attached to the undercarriage of a vehicle shall not be considered in determining compliance with the running clearance measurement found in 49 CFR 523.5(b)(2)(iv), provided as follows:

1. The component(s) is/are installed in front of, and in close proximity to, the wheels, tires, and associated suspension components that create aerodynamic drag.

2. The component(s) will flex without damage when a solid obstacle of 20 cm in height is passed underneath the component(s) when the vehicle is parked on a flat surface. [EPA-HQ-OAR-2010-0799-9463-A1, p.30]

Organization: Toyota Motor North America

Vehicle Classification Definitions [EPA-HQ-OAR-2010-0799-9586-A1, p.21]

NHTSA is concerned that manufacturers have an incentive to classify passenger cars as light-duty trucks to secure an easier CAFE target. Given the 2017-2025 model year standards are being set so far in advance, NHTSA is also concerned that the definitions could eventually lose their relevance as the market evolves. [EPA-HQ-OAR-2010-0799-9586-A1, p.21]

Toyota believes that changes to the current vehicle classification definitions are unnecessary. First, NHTSA itself states that the current definitions are consistent with the text of EISA and Congress' original intent. Toyota agrees with NHTSA. Second, there has been no evidence to substantiate speculation that §523.5(a)(5) is being 'gamed' by manufacturers through addition of 3rd row seating. Third, NHTSA's own evaluation concludes that eliminating §523.5(a)(5) may actually be counterproductive. NHTSA reports that during the 2012-2016 model year rulemaking it evaluated the impact of moving all two-wheel drive SUYs from the truck fleet to the passenger car fleet and concluded that such a move would result in lower fuel savings, increased costs, and significant disruption to the industry. In the year since the 2012-2016 model year standards were finalized, Toyota is unaware of new information that would change this conclusion. Finally, the proposed attribute curves are based on extensive analysis of maximum feasible target curves and standards using current classification definitions. Any revision to the vehicle classification definitions for standards finalized in this rulemaking would change the shape of the footprint curves and the stringency of the proposed standards and would necessitate re-proposal of those standards. To the extent NHTSA is concerned about whether the classification definitions can keep pace with evolving market through the 2017-2025 model year period, we suggest the issue be revisited during the mid-term review. [EPA-HQ-OAR-2010-0799-9586-A1, p.21]

Organization: Union of Concerned Scientists (UCS)

(b) Loss in Benefits from Increased Vehicle Size and Car/Truck Reclassification

Another helpful improvement would be to modify the definition of light trucks, adding new criteria to better differentiate non-passenger vehicles with true off-road capability from passenger vehicles designed to carry individuals. In addition to the current differentiating list, a requirement to meet new criteria – a majority subset of the following 5 items: limited slip center differential, limited slip rear differential, locking axles, skid plates, and 2-speed transfer cases – could be added. [EPA-HQ-OAR-2010-0799-9567-A2, p. 8]

---

29 CARB, Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the “LEV III” Amendments to the California Greenhouse Gas and Criteria Pollutant Exhaust and

Evaporative Emission Standards and Test Procedures and to the On-Board Diagnostic System Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and to the Evaporative Emission Requirements for Heavy-Duty Vehicles, p. 159. [EPA-HQ-OAR-2010-0799-9567-A2, p. 7]

30 http://www.cal-span.org/cgi-bin/media.pl?folder=CARB, January 26, 2012, at approx. time marker 5:21. Accessed February 3, 2012. [EPA-HQ-OAR-2010-0799-9567-A2, p. 7]

Response:

These comments are generally directed at NHTSA's request in the proposed rule regarding the definitions of "passenger automobile" and "light truck" (or "non-passenger automobile"), and thus EPA is not responding to these comments. Although EPA's rules incorporate the definitions used in the CAFE program (see 40 CFR 86.1818-12(b)), EPA adopted these definitions in the MYs 2012-2016 rulemaking in order to harmonize the GHG rules with the CAFE program. EPA did not raise the possibility of revising these definitions in the present rulemaking, or otherwise reconsider or reassess its approach of using the harmonized definitions in the GHG rules. Consequently, EPA is not responding to these comments here, and views them as addressed exclusively to the CAFE program.

9.3. Compliance Data Transparency

Organizations Included in this Section

Natural Resources Defense Council (NRDC)
Union of Concerned Scientists (UCS)

Organization: Natural Resources Defense Council (NRDC)

EPA and NHTSA should create greater public transparency by annually publishing data on each manufacturer's credit status and technology penetration, thus ensuring greater public confidence in the program's effectiveness. [EPA-HQ-OAR-2010-0799-9472-A2, p. 3]

C. Automaker Credit Balance and Technology Application Should be Transparently Reported Annually to Allow for Public Evaluation of Program Effectiveness

Effective public support for the National Program is dependent on transparent data that proves that the program is working effectively. To enable the public to evaluate the effectiveness of the program, EPA should publish an annual public report that includes at minimum the following quantitative information on credits (in megagrams or metric tons and mpg) for each manufacturer's car and light truck fleets: [EPA-HQ-OAR-2010-0799-9472-A2, p. 15]

The amount of cumulative credits or deficits;

The amount of credit transfers made by a manufacturer between its car and light truck fleets (if any);

The amount of credits traded between manufacturers including which manufacturers were involved and the car/truck credit origination and destination; and [EPA-HQ-OAR-2010-0799-9472-A2, p. 15]

The amount of credits generated, for each manufacturer's car and truck fleet, from the additional credit opportunities including:

air conditioning related credits;

multipliers for electric vehicles, plug-in hybrid electric vehicles and fuel cell vehicles;

full-size pick-up truck hybrid and performance-based incentive credits;

CAFE credits associated with flex fuel vehicles and alternative fuel vehicles and the fuel usage assessment that factored into CAFE and GHG calculations; and

off-cycle technology credits. [EPA-HQ-OAR-2010-0799-9472-A2, p. 16]

For each of the five additional credit opportunities above, EPA should specify the basis for calculating the credits and indicate how many credits were awarded for each mechanism. For example, EPA should indicate how many plug-in hybrid electric vehicles earned advanced technology multiplier credits for a manufacturer's car fleet and how EPA calculated the credit per vehicle type. For off-cycle technology credits, EPA should specify what technologies earned the credit. [EPA-HQ-OAR-2010-0799-9472-A2, p. 16]

The EPA should also enhance technology descriptions to the annual Fuel Economy Trends Report and/or Fuel Economy Guide and associated on-line database. Included in the reports should be the following:

Footprint per model and manufacturer;

Sales per model;

Car or truck classifications by model and manufacturer; and

Penetrations of efficiency and emission reduction technologies by vehicle class and manufacturer to understand what portions of vehicles have which technologies. [EPA-HQ-OAR-2010-0799-9472-A2, p. 16]

Organization: Union of Concerned Scientists (UCS)

(e) Transparency and Compliance Accounting

UCS commends the agencies in general on their noticeable efforts to provide high levels of transparency throughout the 2012-2016 and 2017-2025 rulemaking processes. All three agencies—EPA, NHTSA, and CARB—have embraced an approach to base findings not upon confidential business information, but rather upon well-documented, proven, and transparent information. [EPA-HQ-OAR-2010-0799-9567-A2, p. 11]

The agencies could further improve transparency by having a clear public accounting of credits and program compliance. Over the years, it has been exceedingly difficult to independently verify whether manufacturers are complaint with their CAFE obligations, and as noted in previous comment submissions, we have concerns that the same will hold true with manufacturers' vehicle greenhouse gas obligations. Given the numerous compliance flexibility mechanisms being proposed by the agencies – as well as a multitude of opportunities for trading, transferring, banking, and borrowing of credits – it is critical that manufacturers' compliance ledgers be documented, publicly available, and sufficiently granular to assess by which measures companies are complying with the regulations. [EPA-HQ-OAR-2010-0799-9567-A2, p. 11]

For example, for each model year, this may include (but not be limited to) each manufacturer's: car average greenhouse gas emissions performance; light truck average greenhouse gas emissions performance; amount of credits (on at least car and light-truck fleet average basis) accrued through advanced technology vehicle credits, early credits, A/C credits, off-cycle technology credits, flex fuel vehicle credits, and (in the case of MYs 2012-2016) use of temporary lead-time allowance alternative standards; amount of total banks/debits accrued in each year; and a running balance of banks/debits. We urge the agencies to undertake an effort to provide clear public accounting of credits and program compliance. [EPA-HQ-OAR-2010-0799-9567-A2, p. 11]

Further, in order for UCS and other public interest groups to effectively assess industry compliance and behavior, we request that the agencies expand the public availability and quality of disaggregated vehicle data. Because of the new attribute-based standards, it is critical that sub-model level data be regularly published that includes not only fuel economy and greenhouse gas emissions performance specifications, but at a minimum, finalized sales, vehicle footprint, and regulatory vehicle classification. In order to improve the quality of public interest group assessments, we request that the following data be regularly published at the sub-model level: [EPA-HQ-OAR-2010-0799-9567-A2, p. 11]

- Model Year
- Make
- Model/Nameplate
- Engine Family
- Transmission Type
- Criteria Pollutant Emission Certification Level(s)
- Number of Cylinders
- Fuel Type
- Drive Type (Fwd/Rwd/4wd)
- Vehicle Weight (ITW, ETW, curb)
- Regulatory Vehicle Classification (Passenger Car, LDT1, LDT2, etc.)
- Horsepower
- Footprint (or wheelbase and front/rear track width)
- Test Greenhouse Gas Emissions – city, highway, and combined

- Greenhouse Gas Emissions Adjusted for Upstream – city, highway, and combined
- Unadjusted (CAFE) Test Fuel Economy – city, highway, and combined
- Unadjusted (CAFE) Credited Fuel Economy – city, highway, and combined
- Window Label Fuel Economy (for vehicle identification purposes)
- Sales Volume (finalized sales) [EPA-HQ-OAR-2010-0799-9567-A2, p. 11]
- Sales Origin (domestic passenger, import passenger, non-passenger)
- Market Classification
- EPA Classification
- Identification of whether the vehicle applies under Temporary Lead-time Allowance Alternative Standards [EPA-HQ-OAR-2010-0799-9567-A2, p. 12]

UCS requests that the data set include all makes and models covered under EPA and NHTSA greenhouse gas and fuel economy regulations, with no exceptions. As this is a request for the most recent complete model year of data -- not projected sales, or even existing mid-year sales – any automaker confidentiality claims on these data are unwarranted. [EPA-HQ-OAR-2010-0799-9567-A2, p. 12]

Finally, UCS suggests that EPA expand its Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends report to include annual assessments of car/truck designations and vehicle size (by footprint). Doing so will allow the agencies to better track whether manufacturers are complying with the standards by deploying clean, fuel-efficient technologies in their fleets, or whether they are doing so by upsizing, by reclassifying cars as light trucks, or by other regulatory gaming methods. [EPA-HQ-OAR-2010-0799-9567-A2, p. 12]

Response:

As was the case in the MYs 2012-2016 regulation, EPA received several comments about the need for transparency in its implementation of the greenhouse gas program and specifically about the need for public access to information about Agency compliance determinations. NRDC argued that EPA and NHTSA should publish data on each manufacturer's credit status and technology penetration on an annual basis. They suggested specific data that should be disclosed, by car and truck fleets, including the amount of cumulative credits or debits, the within-manufacturer credit transfers between car and truck fleets, air conditioning credits, use of multipliers for EVs, PHEVs, and FCVs, full size pick-up truck HEV and performance-based credits, and off-cycle technology credits. They further suggested that the Fuel Economy Trends Report and the Fuel Economy Guide and associated online database could be enhanced to include additional vehicle and technology information, by model and manufacturer. The Union of Concerned Scientists (UCS) reiterated these comments, noting that EPA should have a "clear public accounting of credits and program compliance." They specifically request that data at the "sub-model level" be published regularly, and that such data include the following: model year, make, model/nameplate, engine family, transmission type, criteria pollutant certification levels, number of cylinders, fuel type, drive type, horsepower, footprint, GHG emissions and fuel economy test results, window label fuel economy, sales volume, sales origin, market classification, EPA classification, and whether a vehicle is using the TLAAS program standards. Like NRDC, UCS also requested enhancements to the Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends report by adding information on car/truck designations and vehicle size/footprint.

EPA remains committed to the principle of transparency and to disseminating as much information as we are reasonably and legally able to provide. Indeed, as explained in section II.F of the preamble, one reason the agencies have rejected off-cycle credits for crash avoidance technologies are difficulties in quantifying GHG emissions/fuel economy improvements attributable to the technology, which would raise issues of transparency and verifiability. Not surprisingly, manufacturers have also commented about the need to protect confidential business information, a practice to which we also remain committed. As stated in the MYs 2012-2016 final rule, and in section III.E of the preamble to the final rule, EPA expects that the dissemination of GHG program data will possibly take place through the annual Fuel Economy Trends report, the annual Compliance Report, or through other means, such as online distribution through fueleconomy.gov or other EPA websites, new GHG-specific reports, or through some combination of all of these. Given that the data will be released well after the conclusion of a given model year, certain information is clearly no longer confidential business information. For example, vehicle production volumes by model type are unlikely to be treated as confidential given that essentially the same information can be purchased from sources like WardsAuto. But production volumes at a finer level of detail, such as at the subconfiguration or configuration level, could potentially be considered confidential because those volumes, which are not available elsewhere, may potentially reveal something about a manufacturer's long-term strategies. These are issues and questions that EPA expects to be addressing as we move forward with publishing our compliance data.

EPA already releases a considerable amount of information regarding fuel economy, emissions, and vehicle characteristics, both at the test level and at the model type level.[19] The downloadable model type data available at fueleconomy.gov will soon have CO_2 emissions values (adjusted label values and unadjusted values, similar to the MPG reporting) in addition to the 127 columns of data we already provide for each model type. However, we plan to expand what we release publicly such that more information is available regarding GHG program compliance, For example, EPA intends to publish the applicable fleet average standards (for cars and for trucks) and the actual fleet performance for each manufacturer, and the resulting credits or debits (in Megagrams, or metric tons). In addition, EPA anticipates publishing the amount of credits generated by each manufacturer (separately for each of the car and truck fleets) under the optional credit programs, and the associated volumes of vehicles to which those credits apply. EPA will also likely publish various credit transactions (transfers among fleets within a manufacturer and trades between manufacturers), as well as the total credits or debits accumulated in a model year and the resulting overall credit or debit balance, taking into account the credit and debit carry-forward provisions. EPA anticipates that the data publication will evolve over time, both as the program progresses and as our data systems adapt to the new requirements and are able to manage and report data accurately and effectively. For example, our first public release of information is likely to be a summary of the early credits generated in the 2009-2011 model years that, at least initially, may not be as comprehensive as the reporting that

[19] See http://www.epa.gov/otaq/tcldata.htm and http://www.fueleconomy.gov/.

follows the 2012 model year.[20] EPA is currently assessing how to best release these data (both the content and the mechanism), but expects that publication will occur later this year.

9.4. Harmonization with CAFE

Organizations Included in this Section

Alliance of Automobile Manufacturers
Ford Motor Company

Organization: Alliance of Automobile Manufacturers

The Agencies Should Insure that the NHTSA Requirements are Fully Harmonized with the EPA Requirements. [EPA-HQ-OAR-2010-0799-9487-A1, p.14]

EPA and NHTSA mention several times in the NPRM that they have worked to develop “strong and coordinated” Federal GHG and CAFE standards so that manufacturers can build a single fleet of vehicles to satisfy requirements under both programs as well as under the California program. As the agencies explain, this helps to reduce costs and regulatory complexity while achieving significant energy security and environmental benefits. While we appreciate the agencies' efforts to harmonize the two programs, more work needs to be done in this area. Specifically, NHTSA should modify its CAFE program for MY 2017-2025 to better harmonize with EPA's GHG program. [EPA-HQ-OAR-2010-0799-9487-A1, p.14]

NHTSA's proposed CAFE standards account for many of the same factors that EPA considers in setting its proposed GHG standards. However, the proposed CAFE program does not include all of the program flexibilities built into the GHG program. NHTSA's program does not account for some of the EPA flexibilities, including off-cycle technology benefits, mobile air conditioning benefits, and benefits for hybridizing large work trucks. However, there are other important flexibilities that are present in the GHG program, but not the CAFE program. These include the advanced technology volume multiplier, the difference in quantification for advanced technologies with respect to the treatment of electricity, natural gas fuel utility factors, unlimited credit transfers between fleets and the one-time carry forward of previous credits through MY 2021. [EPA-HQ-OAR-2010-0799-10153-A2, p.1]

By MY 2025, the difference between the EPA's proposed fleet average standard and NHTSA's proposed fleet average standard equates to about 4.9 mpg. However, this difference is not large enough to offset the benefits of the additional flexible mechanisms included in EPA's program. In order to bring the two programs into better alignment, NHTSA needs to either increase the program flexibilities offered under the CAFE program or modify its curves to better reflect the other differences between the two programs. While the impact of the program differences is relatively small in the early years of the program, it will increase with the passage of time, particularly as manufacturers rely more and more on vehicle electrification in order to comply

[20] Reporting of these credits was due from manufacturers at the end of March, 2012, and EPA is currently evaluating the data to ensure compliance with regulatory requirements.

with the standards. Unless this imbalance is corrected, it will result in significant disharmony in the middle and later years of the time period covered by this proposal. [EPA-HQ-OAR-2010-0799-9487-A1, p.14]

The Alliance recognizes that, with respect to program flexibilities, EPCA and EISA impose some restraints on NHTSA that the Clean Air Act does not impose on EPA. Nevertheless, the Alliance believes that increased harmonization between the two programs is both possible and necessary. The Alliance strongly recommends that NHTSA undertake further study of its ability to include additional, appropriate program flexibilities to provide for equivalent stringency between the proposed CAFE standards and the proposed GHG standards.[10] To the extent that NHTSA cannot fully provide for equivalent stringency through the addition of program flexibilities, NHTSA should adjust the proposed CAFE standards themselves to fully account for the differences in the two programs. Such an adjustment is necessary to ensure that the President's goal of coordinated, harmonized CAFE and GHG programs is realized, and to avoid potential future problems due to disparities in the stringency of the two programs. [EPA-HQ-OAR-2010-0799-9487-A1, pp.14-15]

---

10 - Please note that the term 'program flexibilities' does not refer to the enforcement provisions of the two programs, such as the payment of fines. The agencies' harmonization efforts should focus on achieving equivalent stringency in the CAFE and GHG standards, regardless of any differences in the enforcement mechanisms for the two programs.

Organization: Ford Motor Company

Consistent Geographical Fleets for the CAFE and GHG Programs

As noted repeatedly by the agencies, a key objective of One National Program is harmonization of the GHG and CAFE requirements to the greatest extent possible. In that regard, the agencies should strive to harmonize the fleets that are used to calculate the GHG and CAFE fleet averages, respectively. [EPA-HQ-OAR-2010-0799-9463-A1, p.26]

In its comments on the MY 2012-2016 One National Program regulations, Ford raised an issue related to GHG-CAFE harmonization. The issue is that there is a geographical discrepancy between vehicles covered under the CAFE program and those covered under the Clean Air Act (CAA). Under NHTSA's regulations, CAFE compliance is based on vehicles delivered for sale in the 50 states, the District of Columbia, and Puerto Rico. (49 CFR § 525.4(a)(5)) However, under Section 302(d) of the CAA, the term 'State' is defined to include vehicles delivered to those locations, plus the Virgin Islands, Guam, American Samoa, and the Commonwealth of Northern Mariana Islands. The result is that, under the existing rules, manufacturers have to use different databases of vehicles to calculate their CAFE fleet average and their GHG fleet average, respectively. In Ford's case, the additional territories included under the CAA definition means that the GHG database has about 1,000 more vehicles than the CAFE database. [EPA-HQ-OAR-2010-0799-9463-A1, pp.26-27]

Given the size of Ford's fleet, the impact of an additional 1,000 vehicles in the GHG database is negligible from a fleet average standpoint. However, the administrative burden caused by the need to maintain two databases, and to chase down the relevant information for the vehicles in the additional territories covered by the CAA, is not negligible. The additional vehicles are not easily identified on a model type, base level, configuration, or subconfiguration level, and it represents a significant effort to gather all of this information for the GHG database. In short, the geographic discrepancy between the GHG fleet and the CAFE fleet adds administrative burden for no real benefit. [EPA-HQ-OAR-2010-0799-9463-A1, p.27]

In our comments on the MY 2012-2016 rules, Ford suggested that EPA could amend its regulations to clarify that, for purposes of emissions compliance reporting and fleet averaging only, the fleet is composed of vehicles for the 50 states, the District of Columbia and Puerto Rico. In promulgating the final MY 2012-2016 rules, EPA responded to this comment as follows:

The comment stated that EPA has the discretion under the CAA to align the sales area location of production vehicles for the greenhouse gas fleet with the sales area location for the CAFE fleet and recommended that EPA amend the definitions in 40 CFR 86.1803 accordingly. This would exclude from greenhouse gas requirements production vehicles that are introduced into commerce in the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana. [EPA-HQ-OAR-2010-0799-9463-A1, p.27]

Although EPA has tried to harmonize greenhouse gas and CAFE requirements in this rule to the extent possible, EPA believes that the approach suggested in comment would be contrary to the requirements of the Act. EPA does not believe that the Agency has discretion under the CAA to exclude from greenhouse gas requirements production vehicles introduced into commerce in the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. In addition, this change would introduce an undesirable level of complexity into the certification process and result in confusion due to vehicles intended for commerce in separate geographical locations being covered under a single certificate. For these reasons, EPA will retain the proposed greenhouse gas production vehicle sales area location as defined in the CAA. (75 Fed. Reg. 25484) [EPA-HQ-OAR-2010-0799-9463-A1, p.27]

Based on EPA's response, it is apparent that Ford's original comment was unclear. It was never Ford's intention to exclude vehicles delivered to the Virgin Islands, Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands from any certification requirements, or to otherwise introduce any complexity or confusion into the certification process. Under our concept, the certification process would not change; all vehicles delivered to those locations would be fully certified to all applicable standards, just as they are today. The only proposed change is that, solely for purposes of calculating and reporting a manufacturer's GHG fleet average, the rules would give manufacturers the option not to include the vehicles delivered to the specified locations, thereby enabling the manufacturers to harmonize their GHG fleet with their CAFE fleet. Such a change would have no adverse environmental consequences; as noted above, it would not alter the vehicles sent to the territories in question, and the small number of vehicles at issue is not significant enough to affect a manufacturer's fleet average. Meanwhile, this change would be very beneficial from the standpoint of promoting harmonization and reducing unnecessary administrative burdens. [EPA-HQ-OAR-2010-0799-9463-A1, pp.27-28]

There may be a number of ways to accomplish this goal through amendments to the regulatory language, but here is our suggestion. After 40 CFR § 86.1865-12 (a)(2), add the following:

(3) As used in this section, the term 'delivered for sale' refers to new passenger automobiles and light trucks transported to dealerships for the purpose of retail sales to consumers in the United States (including the District of Columbia), Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of Northern Mariana Islands. For purposes of this section only, manufacturers may elect not to include vehicles delivered for sale in the Virgin Islands, Guam, American Samoa, and the Commonwealth of Northern Mariana Islands their computation of fleet average carbon-related exhaust emissions by notifying EPA of this election in the annual report required pursuant to subsection (l)(2)(vi) of this section. [EPA-HQ-OAR-2010-0799-9463-A1, p.28]

This language helps to clarify the universe of vehicles subject to the fleet average carbon-related exhaust emission calculation in subsection (h)(3)(1) of § 86.1865-12, and it also provides manufacturers with the ability to harmonize this GHG fleet with the fleet of vehicles subject to CAFE reporting under EPCA and EISA. We encourage EPA to adopt this amendment in the interests of promoting harmonization and minimizing the burden on manufacturers. [EPA-HQ-OAR-2010-0799-9463-A1, p.28]

Response:

With regard to the comment from the Alliance of Automobile Manufacturers, EPA finds that it is directed towards the NHTSA program, and as such, no EPA response is needed.

With regard to the comment from Ford, EPA appreciates the company’s willingness to continue to certify these non-mainland vehicles. However, it would still be the case that these vehicles are not included in the manufacturers’ fleet average for the GHG standard, which is not a desirable result. Nor does EPA understand why the associated administrative burden is so great. Presumably Ford (and any other manufacturer) would have already identified whatever extra-territorial vehicles it sells for purposes of CAFÉ. That is, manufacturers would need to know how many and what these vehicles are in order to keep them out of their CAFÉ calculations. Given that this information is already being gathered, EPA does not perceive why applying that same already-at-hand information to determine the GHG fleet average would add significant additional administrative burden.

9.5. Durability Procedures for Diesel Vehicles

Organization:	Alliance of Automobile Manufacturers

Treatment of Diesel-Fueled Vehicles Under Emissions Durability Demonstration Test Procedures [EPA-HQ-OAR-2010-0799-9487-A1, p91]

All technologies should be treated fairly under the exhaust emission durability demonstration procedures at 40 CFR 86.1823-08. Within these procedures, however, diesel-fueled vehicles are specifically disallowed from making use of bench-aging durability procedures, (40 CFR 86.1823-08(d)), adding significant and unnecessary expense to the durability demonstration for such vehicles. Diesel technology offers a greenhouse gas and fuel consumption reduction opportunity and should be allowed similar flexibility to other fuel technologies under the durability demonstration procedures. Therefore, the Alliance requests that EPA work with manufacturers to develop a bench-aging durability procedure for diesel-fueled vehicles for proposal in a future rulemaking. [EPA-HQ-OAR-2010-0799-9487-A1, p91]

Organization:	Chrysler Group LLC

We urge the agencies to treat diesel vehicles fairly under the EPA durability demonstration procedures, as described in depth in the comments from the Alliance.

Organization:	Mercedes-Benz USA, LLC

All technologies should be treated fairly under the exhaust emission durability demonstration procedures at 40 CFR 86.1823-08. The procedures, however, specifically disallow the use of bench-aging durability procedures for diesel-fueled vehicles. This adds significant and unnecessary expense to the durability demonstration for diesel vehicles. Diesel technology offers a greenhouse gas and fuel consumption reduction opportunity and should be allowed similar flexibility to other fuel technologies under the durability demonstration procedures. DAG therefore agrees with others in the industry in the request that EPA work with manufacturers to develop a bench-aging durability procedure for diesel fueled vehicles for proposal in a future rulemaking. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-5]

Response:

Commenters regarding this issue appear to be aware that the issue they are raising cannot be resolved in this final rule. EPA did not propose any changes to the exhaust emission durability demonstration provisions, and thus is not finalizing any related changes to the regulations. In general, EPA strives for emission standards that are applied equitably across technologies, and as such, we are willing to consider future discussions regarding this issue, and, if appropriate, a future rulemaking action.

9.6. Other Certification and Compliance Related Comments

Organizations Included in this Section

Alliance of Automobile Manufacturers
Clean Energy
Ferrari
Manufacturers of Emission Controls Association (MECA)
NGV America

Organization: Alliance of Automobile Manufacturers

Driver Selectable Modes [EPA-HQ-OAR-2010-0799-9487-A1, p.90]

EPA has requested comment on "…whether there is a need to clarify in the regulations how EPA treats driver-selectable modes…" We believe that EPA should continue to use its current methods for dealing with driver-selectable modes and that no additional regulatory clarification is necessary. [EPA-HQ-OAR-2010-0799-9487-A1, p.90]

The current regulations and guidance, administered at the national level, allow common driver-selectable modes to be dealt with in a consistent manner while still allowing flexibility in dealing with any new and unusual modes that may develop. EPA should continue to monitor the use and application of its driver-selectable mode policies and update or refine its guidance as necessary. [EPA-HQ-OAR-2010-0799-9487-A1, p.90]

U.S. Production [EPA-HQ-OAR-2010-0799-9487-A1, p.90]

There are provisions in the proposed regulations that reference U.S. production as a component of applicability or eligibility for that provision. For example, in describing the minimum sales volume threshold for the list of predetermined off-cycle technologies, §86.1866-12(d)(1)(i) states 'The manufacturer may generate a CO_2/g credit ... provided that each technology is applied to the minimum percentage of the manufacturer's U.S. production of passenger automobiles ... for which credit is claimed.' Similarly, the provisions for advanced technology vehicles in §86.1866-12(a)(1) states, "Electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles … that are certified, produced, and delivered for sale in the United States … may use a value of zero (0) grams/mile of CO_2 …" [EPA-HQ-OAR-2010-0799-9487-A1, p.90]

A reasonable interpretation of the provisions above could imply they are applicable only to vehicles produced in the U.S. It is the understanding of the Alliance that the agencies do not intend for the applicability or eligibility of the proposed regulations to depend on a vehicle's origin. [EPA-HQ-OAR-2010-0799-9487-A1, p.90]

The Alliance requests that the agencies clarify that the eligibility and applicability of the provisions being proposed are not contingent on a manufacturer producing vehicles in the U.S. We suggest that where the agencies currently reference "U.S. production" in a provision, that language be revised to instead use the term "production for U.S. sale," which is consistent with the intent of the provisions in both the Clean Air Act and the Energy Policy and Conservation Act of 2005, as amended by the Energy Independence and Security Act of 2007. [EPA-HQ-OAR-2010-0799-9487-A1, p.90]

Credits for Aftermarket Sales of Alternative Fuel Systems

Organization: Clean Energy

Currently only original equipment manufacturers (OEM) are required to meet fuel economy regulations. However, a number of aftermarket conversions to natural gas continue to be performed each year. The effect is that a significant supply of potential fuel economy credits for dedicated and dual-fuel NGVs are lost to the OEMs. Since most aftermarket systems also are exempt for the GHG regulations these credits are also lost to the OEMs. To address this situation, EPA and NHTSA should establish procedures to reward the OEMs for aftermarket conversions. [EPA-HQ-OAR-2010-0799-9511-A1, pp.4-5]

Organization: NGV America

Currently only original equipment manufacturers (OEM) are required to meet fuel economy regulations. However, a number of aftermarket conversions to natural gas continue to be performed each year. The effect is that a significant supply of potential fuel economy credits for dedicated and dual-fuel NGVs are lost to the OEMs. Since most aftermarket systems also are exempt for the GHG regulations these credits are also lost to the OEMs. To address this situation, EPA and NHTSA should establish procedures to reward the OEMs for aftermarket conversions. We propose that converters be able to collect and trade FE and GHG credits with the underlying OEM. At each fuel economy reporting interval, the OEM would substitute FE data for the base vehicle with that for the converted NGV. For example, a dedicated vehicle achieving 18 mpg in gasoline mode would be substituted with an NGV achieving 18/0.15= 120 mpg. For purposes of compliance, the OEM would be treated as if they were the manufacturer of record (MOR) for the converted vehicle. To facilitate this, the converter would have to report to the OEM and NHTSA/EPA the number of vehicles sold each reporting period. [EPA-HQ-OAR-2010-0799-9461-A1, p. 12]

Organization: Ferrari

In-use standards and durability

EPA proposes in-use CO_2 standards that would apply throughout a vehicle's useful life, with the standard determined by adding a 10 percent adjustment factor to the model-level emission results. We agree to keep the 10% higher CO_2 standards to take into account the variability involved, such as: [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

• Normal variability in test results. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

• Variability in the production for the same vehicle configuration. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

• Differences in the equipments with different optional items that can affect CO_2 emissions (curb weight, wheels, tires, engine lubricant, and state of maintenance). [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

We agree that manufacturers may demonstrate in-use emissions durability of off-cycle technologies at time of certification, by submitting an engineering analysis describing why the technology is durable and expected to last for the full useful life of the vehicle. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

OBD monitoring of GHG-emissions

We support EPA that is not proposing any OBD requirements regarding CO_2, CH4, and N2O emissions, because these GHG emissions should not deteriorate over the full vehicle life. We appreciate that EPA does not propose at this time OBD monitoring for off-cycle technologies. [EPA-HQ-OAR-2010-0799-9535-A2, pp.12-13]

Applicability of high altitude provisions to greenhouse gases

We agree with EPA that is proposing to retain its current high altitude regulations so manufacturers would not normally be required to submit vehicle CO_2, CH4, and N2O test data for high altitude. Instead, they would submit an engineering evaluation indicating that common calibrations will be utilized at high altitude, and therefore the compliance is assured also in these conditions. [EPA-HQ-OAR-2010-0799-9535-A2, p.13]

The main benefit is to reduce the number of emissions tests to be performed (in labs located at high altitude or with the capability to simulate such conditions) during vehicles certification, especially relevant for small-volume manufacturers. This approach is useful to streamline the emission certification procedure in U.S.A. [EPA-HQ-OAR-2010-0799-9535-A2, p.13]

Civil penalties

Ferrari opposes any increase in civil penalties for CAFE because it will not result in substantial energy conservation and could have a negative impact mainly on small businesses. Increasing the penalty up to 10.00 $ per tenth-mpg per vehicle will increase the burden mainly on few vehicle manufacturers (which already pay a lot of money in fines and/or penalties) which cannot change their products because are typical and identify the uniqueness of the makes. For example, Ferrari traditionally manufactures high-performance sports vehicles. [EPA-HQ-OAR-2010-0799-9535-A2, p.15]

We believe that higher penalties are not an effective method to increase the CAFE in U.S.A. Historically; the penalties have been paid mainly by foreign manufacturers responsible of a relatively limited number of vehicles. [EPA-HQ-OAR-2010-0799-9535-A2, p.15]

Organization: Manufacturers of Emission Controls Association (MECA)

MECA believes that further reductions of hydrocarbon and NO_x emissions from the existing light-duty vehicle fleet can be achieved by revising the current EPA aftermarket converter performance requirements. California has revised their aftermarket converter requirements for light-duty, gasoline vehicles by requiring a higher level of emission performance and longer durability standards. ARB’s regulation eliminates the sale of older aftermarket converter products that have modest performance standards and a limited 25,000 mile warranty, and requires that higher performance and more durable OBD-compliant aftermarket converter products be used on both non-OBD and OBD-equipped vehicles (ARB implemented their revised aftermarket converter requirements in January 2009). These ARB approved OBD-compliant aftermarket converters are warranted for 50,000 miles based on the use of a more aggressive, high temperature, accelerated engine-aging protocol compared to the vehicle durability demonstration currently required by EPA for approved aftermarket converter products. EPA has not updated its aftermarket converter requirements since 1986 and with more than three million aftermarket converters sold per year across the U.S. (based on surveys completed by MECA with aftermarket converter manufacturers), significant additional reductions of hydrocarbon emissions, including toxic hydrocarbon emissions, and NO_x emissions could be achieved with a national aftermarket converter policy that made use of the same higher performance OBD-compliant aftermarket converters available in California. [EPA-HQ-OAR-2010-0799-9452-A3, p.5]

Response:

Driver-Selectable Modes

EPA requested comments on whether there is a need to clarify in the regulations how EPA treats driver-selectable modes (such as multi-mode transmissions and other user-selectable buttons or switches) that may impact fuel economy and GHG emissions in certification testing. See 76 FR 75089. EPA addresses those comments here. The issue of whether user-selectable technologies may be eligible for off-cycle credits is addressed in preamble section II.F and in section 7 of this RTC document. Note also that this discussion pertains specifically to implementing the testing required on the Federal Test Procedure and the Highway Fuel Economy Test as used to generate combined City/Highway GHG and MPG values for each model type for use in calculating fleet average GHG and MPG values. For the purpose of assigning off-cycle credit values that may be based on a driver-selectable technology (see preamble section II.F), where determination of an accurate real-world benefit of the technology is a fundamental goal, the policy described here and in current EPA guidance may not be appropriate.

New technologies continue to arrive on the market, with increasing complexity and an increasing array of ways a driver can make choices that affect the fuel economy and greenhouse gas emissions. For example, some start-stop systems may offer the driver the option of choosing whether or not the system is enabled. Similarly, vehicles with ride height adjustment or grill shutters may allow drivers to override those features. Under the current regulations, EPA draws a distinction between vehicles tested for purposes of CO_2 emissions performance and fuel economy and vehicles tested for non-CO_2 emissions performance. When testing emission data vehicles for certification under Part 86 for non-CO_2 emissions standards, a vehicle that has multiple operating modes must meet the applicable emission standards in all modes, and on all fuels. Sometimes testing may occur in all modes, but more frequently the worst-case mode is selected for testing to represent the emission test group. For example, a vehicle that allows the user to disengage the start-stop capability must meet the standards with and without the start-stop system operating. Similarly, a plug-in hybrid electric vehicle is tested in charge-sustaining (i.e., gasoline-only) operation. Current regulations require the reporting of CO_2 emissions from certification tests conducted under Part 86, but EPA regulations also recognize that these values, from emission data vehicles that represent a test group, are ultimately not the values that are used to establish in-use CO_2 standards (which are established on much more detailed sub-configuration-specific level) or the model type CO_2 and fuel economy values used for fleet averaging under Part 600.

When EPA tests vehicles for fuel economy and CO_2 emissions performance, user-selectable modes are treated somewhat differently, where the goals are different and where worst-case operation may not be the appropriate choice for testing. For example, EPA does not believe that the fuel economy and CO_2 emissions value for a PHEV should ignore the use of grid electricity, or that other dual fuel vehicles should ignore the real-world use of alternative fuels that reduce GHG emissions. For PHEVs and dual fuel CNG vehicles, where the consumer pays an up-front premium for the vehicle but can recoup that investment by using a less expensive fuel, the regulations allow the use of utility factors to weight the CO_2 performance on the conventional fuel and the alternative fuel. Similarly, non-CO_2 emission certification testing may be done in a transmission mode that is not likely to be the predominant mode used by consumers. Testing under Part 600 must determine a single fuel economy value for each model type for the CAFE program and a single CO_2 value for each model type for EPA's program. With respect to transmissions, Part 600 refers to 40 CFR 86.128, which states the following:

> "All test conditions, except as noted, shall be run according to the manufacturer's recommendations to the ultimate purchaser, *Provided*, That: Such recommendations are representative of what may reasonably be expected to be followed by the ultimate purchaser under in-use conditions."

For multi-mode transmissions EPA relies on guidance letter CISD-09-19 (December 3, 2009) to guide the determination of what is "representative of what may reasonably be expected to be followed by the ultimate purchaser under in-use conditions." If EPA can make a determination that a certain mode is the "predominant" mode (meaning nearly total usage), then testing may be done in that mode. However, if EPA cannot be convinced that a single mode is predominant, then fuel economy and GHG results from each mode are typically averaged with equal weighting. There are also detailed provisions that explain how a manufacturer may conduct surveys to support a statement that a given mode is predominant. However, CISD-09-19 only addresses transmissions, and states the following regarding other technologies:

> "Please contact EPA in advance to request guidance for vehicles equipped with future technologies not covered by this document, unusual default strategies or driver selectable features, e.g., hybrid electric vehicles where the multimode button or switch disables or modifies any fuel saving features of the vehicle (such as the stop-start feature, air conditioning compressor operation, electric-only operation, etc.)."

The unique operating characteristics of these technologies often requires that EPA determine fuel economy and CO_2 testing and calculations on a case-by-case basis. Because the CAFE and CO_2 programs require a single value to represent a model type, EPA must make a decision regarding how to account for multiple modes of operation. When a manufacturer brings such a technology to us for consideration, we will evaluate the technology (including possibly requiring that the manufacturer give us a vehicle to test) and provide the manufacturer with instructions on how to determine fuel economy and CO_2 emissions. In general we will evaluate these technologies in the same way and following the same principles we use to evaluate transmissions under CISD-09-19, making a determination as to whether a given operating mode is predominant or not (using the criteria for predominance described in CISD-09-19). These instructions are provided to the manufacturer under the authority for special test procedures described in 40 CFR 600.111-08. EPA would apply the same approach to testing for compliance with the in-use CO_2 standard, so testing for the CO_2 fleet average and testing for compliance with the in-use CO_2 standard would be consistent.

EPA requested comment on whether the current approach and regulatory provisions are sufficient, or whether additional regulations or guidance should be developed to describe EPA's process. Manufacturers, who were the only commenters on this issue, commented that the current case-by-case approach is adequate, and EPA agrees. We recognize that no regulation can anticipate all options, devices, and operator controls that may arrive in the future, and adequate flexibility to address future situations is an important attribute for fuel economy and CO_2 emissions testing. We believe it would be difficult at this time to construct regulations that adequately and generically address the use of multiple modes in GHG/MPG testing.

U.S. Production

EPA agrees that requirements are not limited to vehicles produced in the U.S., and are not contingent on a manufacturer producing vehicles in the U.S. EPA has revised the regulatory language where appropriate to be consistent with the commenter's suggestion.

Credits for Aftermarket Sales of Alternative Fuel Systems

EPA discusses the applicability of GHG standards to aftermarket conversions in the preamble to the final rule in section III.E.7. One of the relevant points is that credits are generated based on the determination of a fleet average GHG value, and fleet average standards are generally not appropriate for aftermarket conversions. This is because the vehicles that are converted have already been included in the fleet calculations for the OEM. It is possible that at some point EPA and NHTSA could develop a methodology to appropriately account for the emissions impact of aftermarket conversions, but there are a number of other issues that have to be resolved and that EPA was not prepared to address in this rulemaking. For example, it is not immediately clear how the agencies would account for vehicle conversions that take place mid-way through a vehicle's useful life. Given the complexities involved, and the fact that we did not propose a credit program for aftermarket conversions, EPA is not finalizing such a program in this action.

In-use Standards and Durability

EPA agrees with the commenter. The 10% adjustment used to create the in-use emission standard was finalized in the MY 2012-2016 program, and EPA did not propose to change it in this rulemaking. Thus it is being maintained for the MY 2017-2025 program.

OBD Monitoring of GHG Emissions

EPA agrees with the commenter. The MY 2012-2016 program was finalized such that OBD monitoring is not required for CO_2 ,N_2O, and CH_4 emissions, and EPA did not propose to change these provisions for the 2017 and later model years. Consequently, the exclusion of these emission constituents from OBD monitoring continues to be part of the MY 2017 and later program.

Applicability of High Altitude Provisions to Greenhouse Gases

EPA agrees with the commenter. Under the current program, vehicles would be required to meet the CO2, N2O, and CH4 standards at high altitude, but would not normally be required to submit vehicle test data at high altitude. Instead, manufacturers may submit an engineering analysis indicating that common calibration approaches will be used at high altitude. EPA did not propose to change these provisions for the 2017 and later model years, or otherwise reconsider or reassess those provisions. Consequently, the provisions supported by the commenter will continue to be part of the MY 2017 and later program.

Civil Penalties

EPA will not respond to the comments that are directed towards the civil penalties that apply under NHTSA's CAFE program.

Aftermarket Catalysts

EPA finds that the comment from MECA regarding EPA's aftermarket catalyst program is not relevant to the proposed program, and thus a response is not warranted.

10. Additional EPA Program Elements

10.1. Average Banking and Trading

Organizations Included in this Section

American Chemistry Council (ACC)
Association of Global Automakers, Inc. (Global Automakers)
BMW of North America, LLC
Chrysler Group LLC
Eaton Corporation
Ecology Center
Ford Motor Company
General Motors Company
Hyundai America Technical Center
Johnson Controls, Inc.
Motor & Equipment Manufacturers Association (MEMA)
Northeast States for Coordinated Air Use Management (NESCAUM)
Toyota Motor North America
United Automobile Workers (UAW)

Organization: American Chemistry Council (ACC)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 264.]

We support the credit approach taken by the agencies.

Organization: Association of Global Automakers, Inc. (Global Automakers)

We also support the flexibility mechanisms and credits that the agencies propose to make available. These provisions enhance the ability of manufacturers to meet market demand, while maintaining the emissions and energy security benefits of the program. They also provide another means of dealing with the uncertainty associated with the out year standards. The various credits work in different ways, all of which are important. [EPA-HQ-OAR-2010-0799-9466-A1, p.1]

The credit banking and trading system provides an incentive for manufacturers to implement advanced technologies at early dates. [EPA-HQ-OAR-2010-0799-9466-A1, p. 1]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 66.]

Organization: BMW of North America, LLC

BMW supports the proposed flexibilities such as averaging, credit banking, extended approach for off-cycle technologies as well as retaining the approach for A/C credits. These flexibilities are needed in order for manufacturers to achieve overall regulatory compliance in a cost effective manner. [EPA-HQ-OAR-2010-0799-9579-A1, p.5]

BMW supports the continuation of the credit banking scheme as proposed. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 1]

Organization: Chrysler Group LLC

To provide these levels of improvement in the most cost-effective and customer acceptable manner, manufacturers need maximum flexibility. The proposals by the agencies to continue and improve flexibility mechanisms and to offer incentives to encourage early adoption of advanced technologies are helpful and will be an integral part to meeting the National Program goals. [EPA-HQ-OAR-2010-0799-9495-A1, p.2]

Organization: Eaton Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 186-187.]

Eaton believes it is vital that the rule maintains the flexibility to adapt the solutions that can be rapidly adopted by OEMs and accepted by consumers. An example is the increased use of supercharged and mild hybrid technologies that provide fuel savings and performance with return on investments that is acceptable to the average consumer.

The proposed rule provides regulatory incentives that foster innovation and technology deployment. We believe that many of the technologies needed to achieve the proposed standards are available. Some are already in use, while others will benefit from the new paradigm these proposed regulations will provide. Working with our OEM partners, Eaton looks forward to providing high performance and cost-effective fuel efficient technologies.

Organization: Ecology Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 190.]

The Ecology Center would also like to express support for the flexibility mechanisms in the proposed standards.

Organization: Ford Motor Company

Program Flexibilities: Finally, it is important for the rules to include program flexibilities that provide manufacturers with compliance options, and that provide appropriate incentives for the deployment of technologies offering real-world fuel economy and GHG benefits not reflected in the test procedures. The proposal for model years 2017 through 2025 retains and enhances the flexibilities of the earlier rulemaking. Opportunities to acknowledge the environmental impact of more efficient air-conditioning technologies, new refrigerants, real-world fuel economy benefits from non-traditional technologies, and the acceleration of more advanced technologies, will encourage the adoption and penetration of the innovations needed to achieve our aggressive national goals. [EPA-HQ-OAR-2010-0799-9463-A1, p.2]

Ford applauds the efforts of EPA and NHTSA to incorporate a range of compliance mechanisms into the proposed rules. These include credits for innovations such as off-cycle technologies, improvements in air-conditioning systems designed to minimize refrigerant leakage, and the promotion of advanced technologies that operate on a variety of alternatives to traditional gasoline. These compliance mechanisms are fully consistent with the goals of the One National Program, and they also provide manufacturers with needed flexibility to comply with a demanding set of standards. The agencies have recognized that automobile manufacturers come to these regulations with varying product line-ups, different marketing strategies, and a range of capabilities with respect to fuel economy technologies. In this context, a one-size-fits-all regulatory program would be very problematic. Appropriately, the proposed rule offers manufacturers flexibility by enabling them to earn and apply credits for various actions tied to the real-world benefit these technologies provide in regard to both fuel efficiency and greenhouse gas reduction. [EPA-HQ-OAR-2010-0799-9463-A1, p.10]

Organization: General Motors Company

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 36.]

Moving into my second comment, General Motors fully supports the flexibilities in this proposal. Some may criticize them, but the flexibilities included go directly towards real CO_2 reduction and the furthering of advanced technologies.

The flexibilities do provide some compliance opportunity for the manufacturers in the future, but importantly these are already assumed in both of the agencies' assessment of the future of fuel economy levels that are anticipated under this proposal. As a result they are absolutely necessary for us to achieve the equivalent compliance levels anticipated.

Organization: Hyundai America Technical Center

While we believe the standards are achievable, doing so will not be easy and it will depend on additional technology breakthroughs and consumer acceptance. Therefore, Hyundai finds the flexibilities and incentives included in the proposal to be important. Furthermore, we prefer that the incentives be technology-neutral and performance-based so that all OEMs have an equal opportunity to develop technology and achieve the standards. [EPA-HQ-OAR-2010-0799-9547-A1, p.2]

Hyundai appreciates that there are a number of flexibilities in the proposal that address automaker's differing strategies for creating a fuel efficient fleet. For example, some manufacturers are focusing resources on electric vehicles and will receive credit multipliers for expanding that market. Others will improve the fuel efficiency of cargo-carrying full-size pick-up trucks and the agency is providing additional incentives for that improvement. Some makers plan to focus on fuel efficiency leadership with gasoline vehicles, and CARB has adopted a provision to allow those automakers to offset part of the zero emission vehicle mandates for a limited time if it is possible to over-comply with these challenging GHG and CAFE standards. Should it be possible that automakers are capable of significantly over-complying with the EPA and NHTSA requirements; this will be important information to the agencies at the time of the mid-term review regarding the feasibility of achieving the standards. We appreciate and support the government's recognition of varying automaker strategies by providing a variety of incentives to maximize performance in each area. However, we have several comments on areas where we believe modifications to the credit methodologies could improve the program. [EPA-HQ-OAR-2010-0799-9547-A1, pp.3-4]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 172-173.]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 22-24.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 21-23.]

Organization: Johnson Controls, Inc.

Credits are an important tool which can be positively applied and provide the industry necessary options to achieve future standards. [NHTSA-2010-0131-0253-A1, p. 2]

Continuing the use of credits and regulatory flexibilities, as proposed, is necessary and appropriate, but require some revisions. [NHTSA-2010-0131-0253-A1, p. 4]

Organization: Motor & Equipment Manufacturers Association (MEMA)

Continuing the use of credits and regulatory flexibilities, as proposed, is necessary and appropriate, but require some revisions. MEMA provides some proposals for the agencies' consideration. [EPA-HQ-OAR-2010-0799-9478-A1, p.2]

Continuing the use of credits and regulatory flexibilities, as proposed, is necessary and appropriate. Generally, MEMA believes that the agencies have provided adequate program flexibilities. [EPA-HQ-OAR-2010-0799-9478-A1, p.5]

Credits are an important tool and can be positively applied and provide the industry necessary options to achieve future standards. [EPA-HQ-OAR-2010-0799-9478-A1, p.7]

Continuing the use of credits and regulatory flexibilities is necessary and appropriate, but does require some revisions. [EPA-HQ-OAR-2010-0799-9478-A1, p.13]

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 71-72.]

The NESCAUM states support inclusion of flexibility mechanisms in the proposed rule providing manufacturers with pathways to compliance and a range of technologies efficient to meet the goal of the program.

Organization: Toyota Motor North America

The agencies have proposed a variety of credit programs and compliance flexibilities, which Toyota generally supports. These credits and flexibilities are an import aspect of the proposed standards because they allow manufacturers to better manage technology investment and deployment while achieving overall environmental and energy goals. Specific comments about the programs are provided below. [EPA-HQ-OAR-2010-0799-9586-A1, p.9]

Organization: United Automobile Workers (UAW)

Fourth, the UAW appreciates and supports the proposed inclusion by EPA of program flexibilities that will help automakers comply with the tougher standards at a lower cost. These features of the proposal are important for their recognition of the long product cycles of the automotive industry and the inherently “clunky” nature of technology upgrades timed to coincide with major updates of existing models or the introduction of completely new models. [EPA-HQ-OAR-2010-0799-9563-A2, p.2]

The UAW supports the credit averaging, trading and banking provisions proposed separately by NHTSA and EPA, which are a continuation of the comprehensive program established for 2012–2016. NHTSA’s proposal is in line with the dictates of EISA, while EPA has taken advantage of the provisions of the Clean Air Act to propose banking and trading provisions that allow more flexibility but still maintain the features necessary for a harmonized common system of regulation with NHTSA’s proposed rule. The UAW believes that EPA’s proposal is sensible and recognizes the real benefits of early over-compliance by manufacturers. [EPA-HQ-OAR-2010-0799-9563-A2, p.2]

Response:

The commenters above express support for credits programs and flexibilities in general and EPA concurs that these are important aspects of the program. As noted by some commenters, these provisions allow manufacturers to better manage technology deployment, allowing for a smoother implementation of standards. In addition to comments generally supporting flexibilities, many commenters also provided specific comments on the proposed flexibilities, which are addressed in other sections of this Response to Comments document, including; off-cycle credits in Section 7, incentives for EVs, PHEVs, and FCVs in Section 4, and game changing technologies for full size pick-up trucks in Section 5. Specific comments regarding averaging, banking, and trading are addressed in this section below.

10.1.1. Carry-Forward and Carry-Back of Credits

Organizations Included in this Section

Center for Biological Diversity
Ferrari
Fisker Automotive, Inc.
Ford Motor Company
General Motors Company
Motor & Equipment Manufacturers Association (MEMA)
Northeast States for Coordinated Air Use Management (NESCAUM)
Toyota Motor North America
Volkswagen Group of America

Organization: Center for Biological Diversity

The credit loophole would be made even larger were the Agencies to implement their "one time" proposal to extend the credit carry-forward provision even beyond the five-year period Congress has permitted.66 In essence, this provision would allow manufacturers to carry forward credits earned as early as two years ago, in 2010, all the way through 2021, or for more than a decade. It is self-evident that allowing manufacturers to evade increasing fuel efficiency for this long is directly contrary to Congressional intent. Nothing in the statute and nothing in the record justifies any such extension. To the contrary, the fact that Congress specifically limited the time period for carry-forward credits to five years plainly speaks against this industry give-away. We request that the Agencies abandon this proposal. Similarly, the Agencies may not increase the availability of credit transfers between the two fleets, passenger vehicles and light trucks. The existence of statutory caps for these transfers67 is a strong indication of Congressional disapproval of extending them further, and the Clean Air Act's silence on that issue does not override EISA's statutory restriction. [EPA-HQ-OAR-2010-0799-9479-A1, pp. 13-14]

---

66 NPRM, 76 Fed. Reg. at 74,877. The "justification" for this give-away is ludicrous. Nothing is needed to "facilitate the transition to the increasingly more stringent standards" for light trucks: these standards are already egregiously lax and will in any event not begin until 2017. *See* NPRM, 76 Fed. Reg. 74877. [EPA-HQ-OAR-2010-0799-9479-A1, p. 13]

67 49 U.S.C. § 32903(g)(3). [EPA-HQ-OAR-2010-0799-9479-A1, p. 14]

Organization: Ferrari

7) Credits

Ferrari supports all the credit provisions set forth in the present EPA proposal including a one-time carry-forward of any credits generated in MY 2010-2016 to be used anytime through

MY2021. This would provide greater flexibility for manufacturers in using the credits they have generated. [EPA-HQ-OAR-2010-0799-9535-A2, p.13]

Organization: Fisker Automotive, Inc.

Support the proposal to carry over MY 2010-2015 credits through MY 2021. This proposal would provide added utility to credits generated early in the program, which helps to incentivize early adoption of fuel saving technologies. [EPA-HQ-OAR-2010-0799-9266-A1, p. 4]

Organization: Ford Motor Company

Credit Carry-forward

We support EPA's proposal to provide a one-time carry-forward of greenhouse gas reduction credits through the 2021 model year, thus rewarding early investment and providing better flexibility to account for market conditions that may impact year-over-year compliance. We concur with the agency's assessment (76 Fed. Reg. 74968) that, "provisions are not expected to change the emissions reductions achieved by the standards, but should significantly reduce the cost of achieving those reductions." While we acknowledge that NHTSA is legislatively bound to restrict fuel economy credit carry-forward to only 5 years, it must be noted that this is disconnect between the two programs, and may unfortunately drive product strategies for one program that would not otherwise be required by the other. We encourage NHTSA to consider other alternatives that may enable the agency to offset this difference between the GHG and CAFE programs. [EPA-HQ-OAR-2010-0799-9463-A1, p. 21]

Organization: General Motors Company

GM supports the proposed EPA provision to allow credit carry forward beyond 5 years, such that any credits generated from model year 2010 through model year 2016 will be able to be used any time through model year 2021. [EPA-HQ-OAR-2010-0799-9465-A1, p. 3]

Organization: Motor & Equipment Manufacturers Association (MEMA)

The NPRM clearly states the agencies will allow for carry-back/carry-forward credits, as per their respective statutes' stated limitations. [EPA-HQ-OAR-2010-0799-9478-A1, pp.9-10]

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

Flexibility Mechanisms & Credits

NESCAUM supports EPA's proposal to include flexibility mechanisms to provide manufacturers with the means to incorporate a range of technologies to meet the requirements of the proposed standards. Allowing credit transfers between a manufacturer's passenger car and light truck fleet will likewise facilitate compliance without reducing the GHG benefits of the program, as do provisions for carry-forward and carry-back of generated credits. [EPA-HQ-OAR-2010-0799-9476-A1, p. 2

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 72.]

Organization: Toyota Motor North America

Carry-forward and Carry-back Credits [EPA-HQ-OAR-2010-0799-9586-A1, p.9]

EPA and NHTSA propose to continue allowing credits earned by a manufacturer to be applied for a period of up to five model years after the model year in which they were earned. Further, the agencies propose to continue to offer the flexibility to 'borrow' credits up three years into the future to address potential compliance shortfalls in a given model year. [EPA-HQ-OAR-2010-0799-9586-A1, p.9]

These 5-year 'carry-forward' and 3-year 'carry-back' provisions are subject to certain adjustments and limits which differ between NHTSA's CAFE regulations and EPA's GHG regulations. Toyota supports the 5-year carry-forward and 3-year carry-back proposals. [EPA-HQ-OAR-2010-0799-9586-A1, p.10]

Organization: Volkswagen Group of America

3.3. FIVE YEAR DEBIT CARRY-BACK

Volkswagen proposes that EPA and NHTSA amend the NPRM to provide for 5 year carry back of debits. [EPA-HQ-OAR-2010-0799-9569-A1, p. 28]

Response:

EPA is retaining the credit carry-forward and carry-back credit provisions as proposed. Section III.B.4 of the preamble provides EPA's response to the comments regarding credit carry-forward, including both the one-time credit carry-forward of MY 2010-2016 credit to MY 2021, VW's comment regarding five year credit carry-back, and Center for Biological Diversity comments regarding unlimited credit transfers in EPA's program. In addition to the discussion in the preamble, we add the following in response to the comments of the Center for Biological Diversity. The ABT program does not create a "credit loophole", as CBD would have it, but provides needed flexibility and lead time allowing EPA to adopt standards which are more stringent than otherwise would be possible, and reasonably encourages earlier introduction of control technology into the fleet. See 76 FR 57127-129. When credits generated under that program are carried forward to later model years, the carry forward reflects real-world emission reductions, not perpetuation of a loophole. The commenter also argues that, because the Clean Air Act is silent on the issue of credit carry forward, the GHG rules cannot extend that period beyond what is allowed under EISA. The argument that EPA's Clean Air Act authority is constrained by EPCA/EISA was rejected by the Supreme Court in State of Massachusetts v.

EPA, 549 U.S. at 531-32, and more recently by the D.C. Circuit in Coalition for Responsible Regulation v. EPA. See No. 09-1322 (D.C. Cir. June 26, 2012) slip op. pp. 41-42.

10.1.2. Credit Transfers between Cars and Trucks and Credit Trading between Manufacturers

Organizations Included in this Section

Ferrari
Mercedes-Benz USA, LLC
Northeast States for Coordinated Air Use Management (NESCAUM)
Tesla Motors, Inc.
United Automobile Workers (UAW)
Volkswagen Group of America

Organization: Ferrari

We think that there should not be a cap in the amount of credit transferred or traded, in order to give manufacturers the greatest flexibility to comply with the CAFE standards and to harmonize with the corresponding EPA GHG credit provisions. [EPA-HQ-OAR-2010-0799-9535-A2, p.15]

Organization: Mercedes-Benz USA, LLC

DAG also supports the overall structure of the attribute-based program and the provisions for transferring and trading credits. [This comment can also be found in section 2.1 of this comment summary.] [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

DAG supports allowing credits for Class 2b vehicles earned in the medium duty program to be applied in the light duty truck programs as well. The medium duty category is similar in approach to the light duty program, utilizes similar testing methodology and requires significant achievement to reach the requirements. The similarities between the programs support allowing for the flexibility of trading credits between them. [EPA-HQ-OAR-2010-0799-9483-A1, p. 3]

Credits for Class 2b Medium Duty Trucks and Vans

EPA and NHTSA recently established new programs aimed at reducing GHG emissions from medium and heavy duty trucks and van. The program covers MYs 2014-2018. NHTSA's standards are voluntary for MYs 2014-2015, but NHTSA has indicated that it will begin tracking credits when a manufacturer opts into the program. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-16]

The agencies purposely structured the medium/heavy duty truck and van program to be akin to the light duty program. The program is attribute based with the standards set pursuant to a mathematical function. While the agencies added elements to the footprint based attribute to account for the functionality of these vehicles, the agencies also made clear that the measured performance values for CO_2 will generally be equivalent to fuel consumption. The compliance with the light duty and medium duty standards will be measured through similar dynamometer testing. Indeed, the same engine and after treatment technologies that will be used to comply with the Class 2b vehicles in the medium duty program will also be used to comply with the light truck program. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-16]

DAG considers the standards established for medium duty trucks and vans to be challenging and aggressive. For example, as shown in the illustration below, compliance will require that many 6 cylinder diesel engines be downsized to 4 cylinder diesel engines. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-16]

There is ample legal authority to apply medium duty truck and van credits within the light duty programs. EPA has broad discretion under the Clean Air Act to structure programs to ensure that it promotes public health and welfare with cost-effective technology feasibly applied. The agency has often created Average, Banking and Trading (ABT) programs as part of its emissions regulations. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-17]

In the medium and heavy duty rule, the agencies effectively created three separate programs: One for tractor/trailers; one for vocational vehicles; and one for medium and heavy duty trucks and vans. The former two programs are similar and involve vehicles where emissions regulation has in the past been focused exclusively on engines. In those programs, EPA designed a computer model to generate data relating to the vehicle-portion of those regulations. The latter program, on the other hand, is vehicle based - just as with the light duty GHG program - and in fact involves vehicles in the same weight range but subject to different use. Vehicles that meet certain criteria designed to identify 'work trucks' are placed within the medium duty truck and van program; while vehicles meeting certain criteria designed to identify 'medium duty passenger vehicles' are placed within the light duty program. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-17]

The agency initially proposed to restrict each ABT program to its own category within the heavy duty rule, but in the final rule relaxed this restriction and instead defined three heavy duty averaging sets and decided to allow credits to be used within those averaging sets. The first set of Light Heavy Duty vehicles is comprised of trucks within Classes 2b-5. While the agency stated in that rule that credits could be transferred across the heavy duty averaging sets but not between the heavy duty groupings and light trucks, we believe the agency should reconsider that statement as applied to Class 2b vehicles. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-17]

Allowing credit transfers in this Class between the light duty and light heavy duty vehicle fleets is consistent with the agency's general structure to treat like vehicles alike. The basic programs categorize vehicles by general type, construction and use. The ABT program recognizes that similarly weighted vehicles are likely to utilize the same engine and after-treatment technologies to reach and exceed compliance. EPA established a system whereby similar vehicles using similar technologies could share credits across the various programs. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-17]

The same reason allowing credits earned on Class 2b vehicles to be applied within other heavy duty categories applies even more strongly with regard to the light duty fleet. Many vehicles within the light duty fleet are essentially the same or similar to many of the Class 2b vehicles - they are either 'work trucks' or 'medium duty passenger vehicles' depending on their particular configuration. The same engine, transmission and after-treatment technology will be applied to Class 2b vehicles, whether they are in the light duty or the medium and heavy duty program. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-17]

Nothing in the Clean Air Act prohibits the agency from using its discretion to harmonize and promote its greenhouse gas program across similar vehicles and to promote more broadly the application of emissions reducing technology. The agency should exercise this discretion in a limited fashion to allow credits earned on Class 2b vehicles in the medium truck and van program to be applied in the light duty program as well. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-17]

NHTSA also has the legal authority to apply credits developed in its Medium and Heavy Duty Fuel Consumption Program. As noted above, although NHTSA's program is voluntary for MYs 2014-2015, the agency has made clear that it will begin to track credits beginning with a company's decision to opt into the program. Although the legislation mandating NHTSA's program did not expressly authorize a credit program, NHTSA nonetheless exercised its discretion to adopt one and to remain harmonious with the EPA program. NHTSA also noted in the medium and heavy duty fuel consumption program that it has considerably more leeway within the medium and heavy duty program to establish flexibilities and to include consideration of credits within its standard setting than it does under the light duty program. [EPA-HQ-OAR-2010-0799-9483-A1, pp. A-17-A-18]

The fact that EPCA's credit provisions at 49 U.S.C. § 32903 do not expressly refer to credits earned in the fuel consumption program promulgated under § 32022(k) does not preclude NHTSA from exercising this authority. Applying the credits for Class 2b vehicles in the medium duty program to the light duty program is an extension of the same discretion that led and authorized NHTSA to develop the medium duty credit program initially. NHTSA has long construed the EPCA provisions to be limitations on its authority rather than restrictive contours of its authority. NHTSA should use this same authority to extend the credits in a limited fashion, and along the same lines as EPA, to allow credits generated on Class 2b medium duty trucks and vans to be applied in the light duty CAFE program. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-18]

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

Allowing credit transfers between a manufacturer’s passenger car and light truck fleet will likewise facilitate compliance without reducing the GHG benefits of the program [EPA-HQ-OAR-2010-0799-9476-A1, p. 2]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 72.]

Organization: Tesla Motors, Inc.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 94.]

We applaud the use of inter-tradability of credits. They support very critically the rollout of first-generation technology.

Organization: United Automobile Workers (UAW)

The proposal also contains limits on credit trading and transfers that prohibit the use of trading and transfers to satisfy the alternative minimum standard for domestically produced passenger cars. This accurately and effectively implements the provisions Congress included in EISA. [EPA-HQ-OAR-2010-0799-9563-A2, p.2]

Organization: Volkswagen Group of America

The transfer of credits is unlimited under EPA's GHG program. Volkswagen recognizes that the transfer from trucks to cars is limited under NHTSA's CAFE program. However, there is no limit for transfer within the truck compliance fleet, meaning unlimited transfer from larger trucks to smaller trucks or SUVs. [EPA-HQ-OAR-2010-0799-9569-A1, p. 25]

In light of this, Volkswagen is proposing:

Any credits earned by larger trucks and full-size pick-ups due to either the reduced stringency 8 or the unique full-size truck credit program should remain available only amongst large trucks and not be transferable or bankable for use in other segments or compliance fleets. [EPA-HQ-OAR-2010-0799-9569-A1, p. 27]

Volkswagen expects no reasonable protest from stakeholders to limiting transferability since according to EPA's prediction there would be no need to transfer credits away from non-compliant or debit stricken full-size trucks. Should stakeholders protest and claim that this somehow infringes on a flexibility that could be valuable to their future corporate compliance strategy, Volkswagen would then suggest that EPA reconsider the expected burden on full-size trucks. [EPA-HQ-OAR-2010-0799-9569-A1, p. 27]

An alternative would be to provide lower annual reduction percentages and 'game-changing' credits available to a broader range of vehicles, including other trucks and even passenger cars. [EPA-HQ-OAR-2010-0799-9569-A1, p. 27]

[See Figure 3-1 on p. 28 of Docket number EPA-HQ-OAR-2010-0799-9569-A1]

Volkswagen suggests the agency consider a broader range of vehicle capabilities which may require additional flexibility in establishing an achievable standard such as cargo volume, seating capacity, off-road or all-weather capability, or any other attribute which may preclude the adoption of certain fuel saving technologies. This is equally true for trucks of all sizes, minivans, and even some passenger cars. [EPA-HQ-OAR-2010-0799-9569-A1, p. 28]

8 Credits earned from the reduced percent stringency relative to what the larger trucks target would have been had it been subjected to the fleetwide truck percent reduction for that model year.

Response:

While EPA agrees with DAG that transfers between heavy-duty vehicles and light-duty vehicles is not precluded by the CAA, EPA does not agree that such trading should be allowed at this time. Section III.B.4 of the preamble addresses DAG comments regarding the use of heavy-duty vehicle GHG credits in the light-duty vehicle program. In addition, we note that DAG further refined its comments in a meeting with EPA Staff on July 18, 2012. The company further suggested that a medium heavy duty engine could generate credits which could be used in the light duty sector if a 4 cylinder engine is used which engine is also used in light duty applications and the total amount of credits is capped. For the reasons stated in preamble section III.B.4, this comment still remains outside the scope of the proposal. Among other things, acting on it would necessitate amending the heavy duty GHG standards, which allow averaging only between specified averaging sets. There was no notice that the agencies might amend the heavy duty GHG standards as part of this rulemaking.

EPA does not agree with VW's comments that transfers of truck credits to the passenger car category should be restricted. VW's comments regarding truck credits are addressed in Section II.F.3 of the preamble and also III.D.6 where the credits program is discussed in the context of the stringency of the truck standards.

10.1.3. Over Compliance Credits for Use in the California ZEV Program

Organizations Included in this Section

Chrysler Group LLC
Hyundai America Technical Center
Mitsubishi Motors R&D of America, Inc. (MRDA)
Union of Concerned Scientists (UCS)

Organization: Chrysler Group LLC

Chrysler also provides comment on California's 2017-2021MY ZEV Program greenhouse gas over-compliance credit provision, the sales projections utilized by the agencies for this proposed rule, and treatment of diesel vehicles. [EPA-HQ-OAR-2010-0799-9495-A1, p.6]

The California Air Resources Board ("ARB") has approved new Zero Emission Vehicle ("ZEV") regulations for MYs 2018-2021 that, when finalized, will include a provision providing that over-compliance with the federal GHG standards in the prior MY may be used to reduce a manufacturer's ZEV obligation in the next MY (the "ZEV Over-Compliance Provision"). The proposed federal GHG program does not account for or address the potential impacts of the ZEV Over-Compliance Provision on the federal GHG standards. EPA should clarify that the ZEV

Over-Compliance Provision interferes with the EPA standards and is preempted. [EPA-HQ-OAR-2010-0799-9495-A1, p.20]

Section 202(a)(1) of the Clean Air Act provides EPA with general authority to establish emissions standards for motor vehicles and engines. Section 202(a)(2) requires that the EPA standards take effect after such period as EPA finds necessary for the development and application of the requisite technology, considering cost of compliance within that period. [EPA-HQ-OAR-2010-0799-9495-A1, p.20]

EPA has explained both in the MY 2012-2016 rule and the proposal for MY 2017-2025 its approach to the statutory factors in setting standards under Section 202(a)(1). In the MY 2017-2025 proposal, EPA identifies the relevant factors, including availability of technology, cost (including impacts on the industry and consumers), energy impacts, and safety. *See* 76 Fed. Reg. at 74,901, 74,903 and 74,905 (MY 2017- 2025 proposal preamble). In both the MY 2012-2016 final rule and the MY 2017-25 proposal, EPA expressed confidence that the standards at issue strike a reasonable balance considering these factors. For MY 2012-16, EPA explained that it adopted standards it considers feasible and that “there are compelling reasons not to adopt more stringent standards, based on reasonable weight of the statutory factors, including available technology, its cost, and the lead time necessary to permit its development and application.” 75 Fed. Reg. 25,324, 25,468 (May 7, 2010). In the MY 2017-25 proposal, EPA explained that it is “confident that the standards are an appropriate balance of the factors to consider under section 202(a).” 76 Fed. Reg. at 74,975. [EPA-HQ-OAR-2010-0799-9495-A1, p.20]

Chrysler agrees that the proposed standards strike an appropriate balance of the statutory factors as described by EPA in the preamble to the proposal. However, California’s ZEV Over-Compliance Provision will make the national standards more difficult to achieve. This is because National Program greenhouse gas credits used to reduce ZEV obligations would have to be *retired*,33 and accordingly not be available to offset manufacturer-specific under-compliance in the federal program.34 As a result, we would expect overall GHG emissions necessarily to be lower (more stringent) than that which would occur absent the California ZEV Over-Compliance Provision. Removing over-compliance credits from the federal GHG program makes those credits unavailable in the federal GHG “emissions credit market” for automaker’s use in complying with the federal standards. This diversion of federal GHG over-compliance credits for another purpose makes compliance more difficult because there are fewer credits to use, effectively increasing the stringency of the federal GHG standards. As a result, California’s 2018-2025 MY ZEV Program standards, as promulgated with the ZEV Over-Compliance Provision, do impose an additional burden on manufacturers, not accounted for in the balance of relevant statutory factors EPA struck to support the federal MY 2017-25 GHG standards. In short, the California ZEV Over-Compliance Provision disturbs EPA’s careful balance in setting the federal standards, and indeed interferes with that balance. [EPA-HQ-OAR-2010-0799-9495-A1, pp.20-21]

EPA should address in this rulemaking the effect of the California ZEV Over-compliance Provision. Because the EPA standards as proposed, (which Chrysler supports, subject to the comments herein), strike an appropriate balance of the statutory factors under Section 202(a), EPA should explain that in doing so EPA is effectively precluding the validity of California’s

ZEV Over-Compliance Provision. Specifically, the California ZEV Program, as revised to add this provision, would be preempted under Section 209(a) of the Clean Air Act unless granted a waiver (or found to be within the scope of an existing waiver) under Section 209(b). Section 209(b) specifies that no such waiver shall be granted if California's standards "are not consistent with section [202(a)]." The California standards, if revised in final to include the ZEV Over-Compliance Provision, would impose an additional burden on standards that EPA already set at a level that is appropriate based on the statutory factors under Section 202(a). Accordingly, such California standards would interfere and be inconsistent with the federal standards. Thus, EPA may not grant a waiver to a California program that contains this component, and the California program with that component would remain preempted. [EPA-HQ-OAR-2010-0799-9495-A1, p.21]

Were EPA not to conclude that the California Over-Compliance Provision is preempted, EPA would theoretically have to relax the federal standards once California adopts its provision to apply to the 2017- 2025 federal program, to account for the effective increase in stringency that California's provision would cause. In this manner, EPA might theoretically take into account the California provision in setting standards and thereby re-strikes the balance of the Section 202(a) factors. Chrysler doubts this approach would be lawful, however. In determining its proposed standards, EPA did not identify California's ZEV Over-Compliance Provision as a relevant statutory factor. Section 202(a) (and indeed none of the Section 202 provisions), identify California regulations as a relevant statutory factor in setting federal standards. 35 We are not aware of any time that EPA has set standards under Section 202(a) to account for the impact of such a California provision that so directly affects the stringency of the federal program. EPA should make clear that the interference that California would cause through its provision is preempted. [EPA-HQ-OAR-2010-0799-9495-A1, p.21]

The impact of California's proposal should not be underestimated, as the ARB anticipates manufacturers accounting for sales up to 50 percent of total California sales to utilize the ZEV Over-Compliance Provision. Chrysler reiterates its support of a single national GHG program and encourages the EPA to take into account the potential impact of California's ZEV over-compliance provision and deny any waiver request made by California for its ZEV Program insofar as it contains the ZEV Over-Compliance Provision. [EPA-HQ-OAR-2010-0799-9495-A1, p.21]

---

33 In addition, by allowing manufacturers to substitute federal GHG program over-compliance for compliance with the ZEV program, California would effectively be foregoing a portion of the environmental benefits upon which their Clean Air Act waiver for the ZEV Program is premised. [EPA-HQ-OAR-2010-0799-9495-A1, p.20]

34 By modeling all light-duty vehicle manufacturers as a single fleet to establish the 2017-2025 MY federal GHG standards, EPA has implicitly assumed that debits incurred by some companies unable to meet the standards would be satisfied by credits earned by other companies that over-comply with the standards. This implicit assumption is explicitly noted in the 2012-2016 National Program, where in describing the feasibility of the final standards EPA notes that a

company unable to meet the standard could comply by buying credits from another manufacturer. 75 Fed. Reg. 25463 (May 7, 2010) Similarly, EPA requires manufacturers to make good-faith efforts to purchase credits from other manufacturers prior to qualifying for temporary lead-time alternative standards (40 CFR 86.1818-12(e)(3)). [EPA-HQ-OAR-2010-0799-9495-A1, p.20]

35 Chrysler further notes that if EPA were to identify the California ZEV Program as a relevant statutory factor, the ZEV Program requirements for manufacturers to build specific volumes of zero emission and plug-in hybrid electric vehicles would need to be included in EPA's modeling of the technology penetration rates required to meet the National Program standards, thereby increasing the costs associated with the National Program with no additional environmental benefit. [EPA-HQ-OAR-2010-0799-9495-A1, p.21]

Organization: Hyundai America Technical Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 173.]

The California Air Resources Board is proposing to allow those OEMs to offset part of the zero emission vehicle mandate for a limited time through over-compliance in challenging GHG/CAFE standards.

Organization: Mitsubishi Motors R&D of America, Inc. (MRDA)

Mitsubishi Motors proposes that GHG credits should be available to those manufacturers who over-comply with the California ZEV Mandate on a NATIONAL BASIS. Mitsubishi Motors supports compliance with one harmonized national fuel economy and GHG program. However, Mitsubishi Motors must also plan to comply with the ZEV mandate. National and California programs regulating vehicle GHG emissions reflect overlapping standards upon a manufacturer's single ZEV fleet. In recognition of these overlapping programs and OEMs' efforts to deploy capital-intensive ZEVs, California allows manufacturers to earn ZEV credits by over-compliance with EPA's GHG standard starting in MY 2018. Similarly, in order to be consistent with the CA ZEV Mandate, Mitsubishi Motors recommends that EPA allow manufacturers to gain credits by over-compliance with the California ZEV mandate nationwide starting in MY 2018. The mid-term evaluation also offers an opportunity for EPA to consider an option to offer manufacturers, who demonstrate plans to over-comply with the ZEV Mandate for the entire MY 2022 through 2025 timeframe, a 2 grams per mile GHG credit. This will allow manufacturers to keep their conventional technology fleets in compliance, while introducing and selling advanced ZEV technologies nationally. Mitsubishi Motors' proposal will contribute to reducing GHG emissions while providing customers reasonably-priced vehicle choices. [EPA-HQ-OAR-2010-0799-9507-A1, p.5]

Organization: Union of Concerned Scientists (UCS)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 139.]

This is why policies like California's Zero-Emission Vehicle program are an important complement to the proposed greenhouse gas and fuel economy standards being discussed here today. The Zero-Emission Vehicle program helps ensure that investments in research, development and deployment of advanced vehicle technologies continue.

Response:

In response to Chrysler's comments, issues of whether a California state provision should be preempted are not part of this proceeding, and EPA therefore declines to address this comment here. The commenter may resubmit this comment if and when the issue should be presented directly to EPA, potentially in a request by the State of California for a waiver pursuant to section 209 (b) or in some other direct context. EPA disagrees with Chrysler's assertion that the feasibility of the standards hinge on the availability of credits through banking or trading. EPA has shown that the standards being finalized are feasible at reasonable cost without assuming carry-forward of banked credits or credit trading between manufacturers. See discussion in preamble III.D.6 and RIA Chapter 3 footnote 2. Further, EPA's requirement that SVMs make a good faith effort to seek out credits as part of the MY 2012-2016 SVM exemption eligibility provisions does not require SVMs to buy credits unless they are reasonably available from other manufacturers. If EPA determines that the SVM has made a good faith effort to purchase credit but that credits are not available, the SVM is exempt from meeting CO_2 standards with no obligation to purchase credits.

In response to Mitsubishi's comments regarding additional credits for over-compliance with the California ZEV program, EPA is already adopting multiplier incentives for PHEVs, EVs and FCVs which we believe are appropriate (see preamble section III.C.2.c.ii). EPA does not believe that it is necessary at this time to introduce an additional type of credit for these vehicles or tie the availability of incentives for these vehicles to a manufacturer's performance in the California ZEV program. Also, EPA did not seek comments on using over compliance with the ZEV program as the basis for an EPA GHG credit. Mitsubishi comments that California allows manufacturers to earn ZEV credits by over-compliance with EPA's GHG standard starting in MY 2018, and in order to be consistent with the CA ZEV Mandate, EPA should allow manufacturers to gain credits by over-compliance with the California ZEV mandate nationwide starting in MY 2018. EPA does not agree that this type of credit is a matter of making the programs consistent. The California provision to allow GHG credits to be used in the ZEV program would presumably reduce the number of ZEVs that a manufacturer would be required to produce. The commenter does not explain how a 2 g/mile credit for ZEV over compliance is needed to make the two programs consistent. The commenter also does not offer a basis for why 2 g/mile is an appropriate credit. Further, the California ZEV provision is limited and only available for essentially the same model years as the EPA multiplier incentives for these vehicles. Manufacturers will already be effectively receiving credits under the EPA program for the same types of vehicles covered by the ZEV program, as noted above. EPA believes the additional credit suggested by the commenter would be redundant and is unnecessary.

10.2. Nitrous Oxide (N_2O) and Methane (CH_4) Standard

10.2.1. Flexibility for Compliance with N_2O and CH_4 Standard

Organizations Included in this Section

America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)
Association of Global Automakers, Inc. (Global Automakers
BMW of North America, LLC
Ferrari
General Motors Company
Toyota Motor North America
VNG Co. (VNG)
Volkswagen Group of America

Organization: America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)

CO_2-Equivalent Option

AGA and ANGA support EPA's decision, first announced in the preamble to the Heavy Duty Rule (76 FR 57123) to include the CO_2 -Equivalent Option as part of the light-duty regulations through MY 2016, to allow for the Option to be used on a test-group basis instead of having to apply a manufacturer's entire fleet. EPA should now extend the Option through MY 2025, and continue the policy of allowing CO_2 -equivalent compliance on a test-group basis, which would enable manufacturers who offer NGVs to avoid requiring all of their vehicles to be subject to the CO_2-Equivalent Option. [EPA-HQ-OAR-2010-0799-9548-A1, p. 8]

However, if the agency adopts its proposal to require that the Option be applied to a manufacturer's entire fleet, we support EPA's additional proposal to include an offsetting "equivalence option adjustment factor", so that "manufacturers do not have to offset the typical N_2O and CH_4 vehicle emissions, while holding manufacturers responsible for higher than average N_2O and CH_4 emissions levels." [EPA-HQ-OAR-2010-0799-9548-A1, pp. 8-9]

Organization: Association of Global Automakers, Inc. (Global Automakers)

With regard to the standards for nitrous oxide and methane, we support the credit-based compliance option for the nitrous oxide and methane standards, as well as the new "upward adjustment" approach to allow these emissions to be included with carbon dioxide emissions. However, we see no need for the limitation on the use of methodologies under 40 Code of Federal Regulations (CFR) Section 86.1818-12(f) for nitrous oxide and methane, finalized under the MYs 2012-2016 standards and carried over for MYs 2017-2025. We would like to see an allowance to use different compliance options for methane and/or nitrous oxide and also for passenger car and light truck fleets in the same model year, without the need for prior EPA approval. This restriction limits manufacturers' compliance options but with no clear environmental benefit. We urge EPA to eliminate this restriction in the final rule. [EPA-HQ-OAR-2010-0799-9466-A1, pp. 2-3]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 67.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 51.]

We also support the credit-based compliance option for methane and nitrous oxide standards, as well as the new upward adjustment approach to allow these standards to be included with carbon dioxide emissions. However, we would like to see more flexible -- more flexible compliance options and will be addressing that in more detail in our written comments.

Organization: BMW of North America, LLC

BMW supports the option to convert measured N_2O and CH_4 emissions that are above the applicable standards into CO_2 -equivalent emissions for compliance purposes. The calculation of emission debits on this basis allows them to be offset by other GHG reduction measures. While leading to the same overall GHG reduction impact, this option provides flexibility and still gives an incentive to further work on the reduction of N_2O and CH_4 emissions. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 4]

Organization: Ferrari

We agree with the option proposed by EPA in this rulemaking to use CO_2 credits to comply with the CH_4 and N_2O standards, because this measure is consistent with the compliance option to add these emissions to those of CO_2 (instead to meet specific standards), and increases the flexibility to comply. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

Organization: General Motors Company

In the NPRM, EPA requests comments on "establishing an adjustment to the CO_2 - equivalent standard for manufacturers selecting the CO_2 -equivalent option established in the model year 2012–2016 rulemaking." (p. 74993). GM disagrees with establishing a blanket adjustment to the CO_2 -equivalent standard. EPA has gone to great lengths to establish CO_2 emission targets based on individual manufacturer fleets. Using the average value of all passenger cars and light trucks to establish an adjustment factor will inherently and unduly lessen the stringency for some manufacturers while increasing the stringency for others. [EPA-HQ-OAR-2010-0799-9465-A1, p. 5]

In order to appropriately incorporate a CO_2 -equivalent approach into the standard, EPA would have to return to the baseline data and develop CO_2 target value equations based on CO_2 - equivalent data. [EPA-HQ-OAR-2010-0799-9465-A1, p. 5]

A second approach would be to modify the CO_2 -equivalent equations instead of adjusting the CO_2 standard. Under the current regulations, if a manufacturer meets the N_2O and CH_4 emission standards, they are not required to include N_2O or CH_4 emissions in their carbon related exhaust emission (CREE) calculations (i.e., the impact of N_2O and CH_4 emissions on the CREE value is zero). If a manufacturer chooses the option to use the CO_2 -equivalent CREE equations, it has to include all CH_4 and N_2O emissions which would result in an increase of up to approximately 3 g/mile for vehicles that would have otherwise been able to meet the N_2O and CH_4 emission standards. So, in order to make the CO_2 -equivalent option more appealing, EPA would have to modify the CO_2 -equivalent equations in such a fashion as to not penalize a manufacturer for meeting the current CH_4 and N_2O emission standards while still including a mechanism that would allow a manufacturer to account for exceedances of the standards. [EPA-HQ-OAR-2010-0799-9465-A1, p. 5]

What follows is a suggested modified equation for EPA to consider:

Change the CREE equation from:

$CREE = [(CWF/0.273)xNMHC]+(1.571xCO)+CO_2 +(298xN_2O)+(25xCH_4)$

To:

$CREE = [(CWF/0.273)xNMHC]+(1.571xCO)+CO_2 +[298x(N_2O-0.010)]+[25x(CH_4-0.030)]$

And:

Include requirements that negative values for N_2O or CH_4 contribution shall be set to zero. (An allowance would have to be made such that manufacturers could set N_2O equal to 0.010 until a practical and accurate method of measuring N_2O is established.) [EPA-HQ-OAR-2010-0799-9465-A1, p. 5]

By subtracting the N_2O and CH_4 emission standards from their respective emission values and setting any negative result to zero, the manufacturer would be required to account for emissions in exceedance of the standards and would not benefit from performing at levels lower than the emission standards (does not affect the stringency of the fleet-average standard). [EPA-HQ-OAR-2010-0799-9465-A1, p. 5]

Organization: Toyota Motor North America

Standards and Flexibility - As part of the recently completed heavy-duty GHG rulemaking, EPA finalized provisions allowing manufacturers to use CO_2 credits, on a CO_2- equivalent basis, to meet the light-duty N_2O and CH_4 standards. Toyota appreciates, having the option of using CO_2 credits to meet N_2O and CH_4 standards on a test group basis as needed for 2012-2016 model years and supports EPA's current proposal to extend this flexibility through the 2025 model year. [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

Organization: VNG Co. (VNG)

Recently-revised alternative compliance options for the methane standard are extended and made permanent by this NPRM, which will benefit NGVs whose slightly elevated methane emissions compared to gasoline vehicles are more than outweighed by reductions in CO_2 emissions. [EPA-HQ-OAR-2010-0799-7941-A2, p. 6]

Methane Standard Compliance Flexibility

VNG strongly supports the Agencies' decision to allow automakers the same flexible options for meeting methane (CH_4) standards for light-duty vehicles as are now allowed for heavy-duty vehicles. Under these flexible rules, automakers and conversion manufacturers may convert CO_2 over-compliance into CO_2 equivalents of CH_4 (or N_2O) that can be used to facilitate compliance with these standards. As it is the total global warming potential ('GWP') of all GHGs that is important, and not the emissions of any specific pollutant, this flexibility is appropriate and in line with EPA's regulatory goal. [EPA-HQ-OAR-2010-0799-7941-A2, p. 10]

This flexibility may be useful for manufacturers of NGVs, particularly converters that will be important in developing the market in the early years. Because small quantities of unburned natural gas from NGV engines may be emitted as methane, NGVs may have slightly higher emissions of this GHG than petroleum-fueled ICE vehicles. However, due to much greater reductions of CO_2 emissions, NGVs still yield net GHG emission reductions of approximately 24 percent. These flexible compliance rules will ensure that net GHG reductions are accounted for properly, and automakers are not penalized so long as slight increases in methane emissions are offset by CO_2 over-compliance. [EPA-HQ-OAR-2010-0799-7941-A2, p. 10]

Organization: Volkswagen Group of America

EPA seeks comment in the NPRM regarding additional flexibility when complying with the N_2O standards. Volkswagen supports EPA’s proposal to allow the option of using CO_2 credits to comply with the N_2O standards and Volkswagen also supports the option of meeting these standards on a test group basis. Furthermore, Volkswagen supports the NPRM proposal to extend theses options through all models years of the regulation beyond 2016. Volkswagen also supports the concept of an adjustment factor to the CO_2 equivalent standard for manufacturers selecting the CO_2 equivalent option the pathway to compliance with both CH_4 and N_2O. Volkswagen pledges to work with EPA in the future to generate the proper data such that an appropriate adjustment factor can be determined. [EPA-HQ-OAR-2010-0799-9569-A1, p. 34]

Response:

EPA received only supportive comments regarding the proposal to permanently allow CO_2 credits to be used on a CO_2-equivalent basis to meet the CH_4 and N_2O standards and EPA is finalizing this provision as proposed. EPA concurs that this provision provides an important flexibility to manufacturers while not undermining the overall GHG reductions of the program. Additional discussion regarding CO2-equivalent options and comments, including GM’s comments, is provided in preamble section III.B.9.a.

10.2.2. N_2O Measurement and Compliance Statement Option

Organizations Included in this Section

Alliance of Automobile Manufacturers
Association of Global Automakers, Inc. (Global Automakers)
Ferrari
Ford Motor Company
General Motors Company
Hyundai America Technical Center
Kia Motors
Toyota Motor North America
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

Additional time is needed for development of a method for measuring nitrous oxide (N_2O). EPA has recognized the difficulties and complexities of evaluating, procuring and installing the equipment that would be needed to measure N_2O. But, as our comments explain, EPA still has not provided sufficient time for manufacturers to incorporate accurate and robust N_2O measurement capabilities into their test sites. The deadline for measuring N_2O should be extended until the N_2O measurement issues are resolved, and N_2O measurement capabilities should be reevaluated during the mid-term and interim evaluations. By so doing, EPA would be providing manufacturers with sufficient time to evaluate appropriate test equipment and would be aligning possible N_2O regulatory changes with possible subsequent changes to other light-duty GHG regulations. [EPA-HQ-OAR-2010-0799-9487-A1, p.5]

Nitrous Oxide (N_2O) Measurement [EPA-HQ-OAR-2010-0799-9487-A1, p.71]

EPA has recognized the difficulties and complexities of evaluating, procuring and installing the equipment that would be needed to measure N_2O and has proposed that manufacturers be permitted to use compliance statements in lieu of test data through MY 2016. However, as explained below, EPA has not provided sufficient time for manufacturers to incorporate accurate and robust N_2O measurement capabilities into their test sites. We propose that the deadline for measuring N_2O be extended until the measurement issues are resolved. The N_2O measurement capabilities should be reevaluated during both the mid-term evaluation of standards and the "check-ins" occurring prior to the mid-term. By so doing, EPA would be providing manufacturers sufficient time to evaluate appropriate test equipment and would be aligning possible N_2O regulatory changes with possible subsequent changes to other light duty GHG regulations. [EPA-HQ-OAR-2010-0799-9487-A1, p.71]

The first issue with regard to N_2O measurement timing is that there is currently no accurate measurement technology available that is suitable for high-volume testing. As one example, the gas chromatograph electron capture detector (GC-ECD) is not suitable for high-volume testing since it includes an off-line multi-hour long analysis and has robustness issues. [EPA-HQ-OAR-2010-0799-9487-A1, p.71]

EPA provided a technical study of the capabilities of currently available and potentially available future measurement technologies as a separate memorandum to the docket. The study compares instruments by analyzing ambient air and diluted vehicle exhaust samples on a number of different vehicles and schedules (FTP and HFET). The EPA technical study highlights the continuing difficulties of the currently available measurement technologies to accurately measure N_2O. [EPA-HQ-OAR-2010-0799-9487-A1, p.71]

In the study, EPA compared the Fourier Transform Infrared Spectrometer (FTIR) to the GC-ECD and concluded that the "FTIR compared very well to GC-ECD, which is considered the gold standard," but the accompanying data actually demonstrates the opposite. The data shows significant differences and variability between these two instruments on the order of approximately -17 to +25 ppb N_2O equivalent for ambient air analysis and approximately -27 to +85 ppb N_2O equivalent for vehicle exhaust testing. These differences represent a significant error at an N_2O standard level of 0.010 g/mi. [EPA-HQ-OAR-2010-0799-9487-A1, p.71]

In addition, in comparing the FTIR to the Non-Dispersive Infrared (NDIR) analyzer, the study states "Both the NDIR and FTIR analyzers performed well, however some questions regarding performance remain." The accompanying data, however, shows significant interferences with both analyzers, results which are similar to those of the previously supplied Alliance Technical Study (June 2011). [EPA-HQ-OAR-2010-0799-9487-A1, p.71]

The study also highlights a potentially promising new N_2O measurement technology that is based on laser spectroscopy and is made by a few manufacturers. However, N_2O analysis is so new that most of these instruments are still in the development stages and hence are prototypes. Although these instruments show promise for N_2O analysis, questions remain as to their accuracy and robustness (i.e., reliability) at such low N_2O standards. [EPA-HQ-OAR-2010-0799-9487-A1, p.72]

The study contains evaluations of two such laser instruments based on simulated exhaust gas (water, carbon monoxide (CO), CO_2 and N_2O). In comparison to NDIR and FTIR, the data for the first laser instrument shows interference errors that were typically lower, ranging from -29 to +10 ppb N_2O equivalent. Although the errors appear to be reduced, they still represent a significant portion of the 10 mg/mi N_2O standard. CO and CO_2 measurements were likewise affected by interference gases but in the opposite direction, i.e., higher levels than that observed with N_2O. [EPA-HQ-OAR-2010-0799-9487-A1, p.72]

For the first laser instrument the study concludes that the instrument "…performed very well and does not appear to show any susceptibility to CO, CO_2, or water interference…" and "Based on CO and CO_2 measurement error, we believe that the bulk of the associated N_2O measurement error is due to bag blending error." It would seem that if the N_2O errors were due to gas blending errors, then CO and CO_2 would be likewise affected, but the data generally shows an underreporting of N_2O and an over reporting of CO and CO_2. Looking at this limited data, the Alliance believes that although the instrument shows promise, it still demonstrates significant measurement errors which have not yet been accounted for. [EPA-HQ-OAR-2010-0799-9487-A1, p.72]

The second laser instrument evaluation showed similar N_2O measurement errors in the presence of interference gases but this was attributed to "…the inability to properly zero/span the instrument after the initial zero/span at the start of the testing." In the conclusions it is stated that

"EPA intends to re-evaluate this instrument after the manufacturer has resolved issues…" [EPA-HQ-OAR-2010-0799-9487-A1, p.72]

Suffice it to say that until more studies are conducted by multiple facilities, including correlation vehicle testing between facilities, the true accuracy of laser based instruments is still to be determined. [EPA-HQ-OAR-2010-0799-9487-A1, p.72]

The second issue with regard to N_2O measurement is emission development and certification timing. Taking all things into account, we estimate that it will take approximately 4.5 years to properly install a new N_2O analyzer into a single test site. Below is a graphical representation of the estimated timeline for instrument procurement and installation. [EPA-HQ-OAR-2010-0799-9487-A1, p.72] [For the 'graphical representation', please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.73]

Included in the above graph are the generic timelines for emission development and certification for the individual model years. We estimate that the first test site with N_2O measurement capabilities would not be available until midway through the emission development process for MY 2019. We estimate that the earliest that a manufacturer could certify a limited portion of its product line with measured N_2O data would be mid-MY 2019. Please note that a manufacturer's ability to certify in MY 2019 will still be limited by the number of available test sites (i.e., it would be impossible to certify a full-line manufacturer's entire product line in the MY 2019 utilizing only one test site). [EPA-HQ-OAR-2010-0799-9487-A1, p.74] [For the 'graph', please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.73]

N_2O Data [EPA-HQ-OAR-2010-0799-9487-A1, p.74]

EPA has requested "…city and highway cycle N_2O data on current Tier 2 vehicles…" 1 However, supplying N_2O data will not be possible at this time due to lack of accurate and robust N_2O measurement instrumentation and insufficient lead time to install this instrumentation into certification quality test laboratories. As mentioned above, it will take several years to get even rudimentary measurement capability that is proven to be both accurate and robust. [EPA-HQ-OAR-2010-0799-9487-A1, p.74]

N_2O Certification [EPA-HQ-OAR-2010-0799-9487-A1, p.74]

In paragraphs 40 CFR §86.1823-08(m)(2)(iii) and §86.1829-01(b)(1)(iii)(G) of the proposed rule, EPA proposes the extension of the use of alternative N_2O deterioration factors (DF's) and N_2O compliance statements, respectively, through the MY 2016. While the Alliance appreciates the extension of these deadlines, setting these deadlines is essentially precluding a manufacturer from utilizing the concept of carryover which is critical to the successful implementation of emission certification programs. Therefore, the Alliance recommends that the use of alternate N_2O DFs and compliance statements be further extended and that the requirement to measure N_2O only be applied to new emission certification programs that are implemented after the establishment of proper N_2O measurement instrumentation and procedures. [EPA-HQ-OAR-2010-0799-9487-A1, p.74]

In order to balance emission testing burden and certification workload, manufacturers routinely "carryover" emission certification and durability data. Carryover essentially means that representative emission data that was generated in a previous model year is re-used in the new model year in lieu of repeating the same emission tests. Lacking certification quality N_2O data in early model years means that the emission data will not be viable for carryover into a model year that requires actual N_2O data. That means that all emission data generated during these years will not qualify for carryover into a model year for which actual N_2O data is required. Therefore, assuming that N_2O measurement capabilities are not available until the MY 2017, manufacturers would be forced to rerun all of their emission durability and certification testing in one model year. This would be an unnecessary and unwarranted certification burden for that particular model year. [EPA-HQ-OAR-2010-0799-9487-A1, pp.74-75]

In-Use N_2O [EPA-HQ-OAR-2010-0799-9487-A1, p.75]

Although EPA did not propose any changes to in-use testing requirements, the Alliance requests that EPA exclude N_2O measurement and reporting from in-use testing (IUVP and IUCP) for all model years and test groups that certify to the N_2O standards via a compliance statement. Because accurate N_2O measurement technology is not readily available, manufacturers have been forced to rely on theoretical information and/or possibly inaccurate data in order to make N_2O compliance statements. EPA should not hold the manufacturers accountable for measuring N_2O utilizing a method that will have been established subsequent to certification, nor should EPA hold a manufacturer responsible for meeting a standard for which accurate measurement methods were not available at the time of certification. [EPA-HQ-OAR-2010-0799-9487-A1, p.75]

Heavy Duty N_2O [EPA-HQ-OAR-2010-0799-9487-A1, p.75]

Although EPA has not proposed modifications to the heavy-duty GHG regulations, the Alliance requests that EPA also modify the heavy-duty GHG N_2O measurement requirements to coincide with the timing of the light-duty requirements. Heavy-duty chassis GHG testing will be performed on the same test sites that are utilized by light-duty and will therefore have the same N_2O measurement issues. Providing N_2O measurement relief solely for the light-duty vehicles does not fully address the issue. [EPA-HQ-OAR-2010-0799-9487-A1, p.75]

Organization: Association of Global Automakers, Inc. (Global Automakers)

With regard to the proposed requirement for testing to measure nitrous oxide emissions beginning in MY 2017, we urge EPA to reconsider the cost-effectiveness of this requirement. The quantity of these emissions is quite low, and we see no indication that they will become an important factor in climate change in the future. Testing for this substance will require expensive new analyzers, whose performance remains to be determined. We support the comment of one manufacturer at the Detroit public hearing, which noted that the proposed test method for nitrous oxides is neither proven nor developed and that the Non-Dispersive Infrared Analyzer (NDIR) and Fourier Transform Infrared (FTIR) bag analysis methods currently have repeatability, durability and/or practicality concerns. [EPA-HQ-OAR-2010-0799-9466-A1, p. 3]

We urge the agency to allow manufacturers to continue to demonstrate compliance using the pre-MY 2017 analysis-based methodology in 2017 and thereafter. EPA should monitor these emissions and the development of testing analyzers and adopt new test-based requirements in the future should the emissions grow in significance or when the testing technology is ready. For instance, it would be appropriate to review the testing technology as part of the mid-term review and then determine whether testing as part of the regulations should be finalized following the mid-term review. [EPA-HQ-OAR-2010-0799-9466-A1, p. 3]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 67-68.]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 51-52.]

Organization: Ferrari

EPA intends to extend the ability for manufacturers to use compliance statements for N_2O standard based on good engineering judgment in lieu of test data through MY 2016. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

It is fine, but we request EPA to delete the requirement to actually measure N_2O emissions for the following reasons: [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

The quantity of these emissions is quite low, and they should remain a minimal contribution over the total GHG inventory in the future. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

The related burdens (laboratory update, testing, reporting) is relevant. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

There are some concerns on the accuracy of the measurement. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

At least small-volume manufacturers should be exempted to carry out the N_2O measurement. [EPA-HQ-OAR-2010-0799-9535-A2, p.12]

Organization: Ford Motor Company

As noted in the NPRM and support documents, EPA understands that N_2O measurement complexity remains an important issue to be addressed for both 2012-2016 MY as well as 2017 MY and beyond. Due to these measurement difficulties, EPA has granted some flexibilities through previous rulemakings and is now proposing to extend the timing for requiring N_2O measurement to the 2017 MY. While Ford acknowledges these allowances, we do not believe they sufficiently address all of the concerns related to N_2O. We agree with the Alliance comments that recommend that N_2O measurement requirements be delayed until those measurement issues are fully resolved. A number of instruments have been studied with varying levels of success. Variability remains a key concern, but we believe that some of these technologies show promise. However, much additional work remains to identify viable solutions, conduct correlation studies, and upgrade facilities for certification level testing. Until that time, there should be no requirement to measure N_2O or comply with a standard that cannot be accurately assessed. [EPA-HQ-OAR-2010-0799-9463-A1, p. 24]

Ford is in the process of collecting data to further evaluate the capability of N_2O measurement technologies. Once that information is available, we will review it with EPA to provide additional basis for 2012 – 2016 MY interim containment actions and additional flexibilities on N_2O requirements. Going forward, we look forward to continued data-driven dialogue with EPA to resolve the current manufacturer concerns with N_2O compliance, beyond the allowances outlined in the current proposal. [EPA-HQ-OAR-2010-0799-9463-A1, p. 25]

Organization: General Motors Company

GM supports the deferral for N_2O measurement until MY2017. As mentioned in the Alliance comments, since additional time and evaluation are necessary to develop accurate and repeatable N_2O measurement capabilities, we recommend that work continue expeditiously – and progress be evaluated as part of one of the mid-term review "check-ins." [EPA-HQ-OAR-2010-0799-9465-A1, p. 4]

Organization: Hyundai America Technical Center

Testing for N_2O [EPA-HQ-OAR-2010-0799-9547-A1, p.7]

EPA has proposed a new requirement to measure N_2O emissions starting in MY 2017. Based on research we have conducted, Hyundai believes the measurement methods suggested by the agencies are not fully proven or developed, and are very expensive as they require new analyzers. [EPA-HQ-OAR-2010-0799-9547-A1, p.7]

Hyundai prefers a bag analysis method of measurement to minimize decreased testing throughput. The NDIR, FTIR and GC bag analysis methods for N_2O currently have repeatability or practicality concerns. Therefore, while Hyundai supports the bag methodology for measurement, we recommend that the testing issue be revisited at such time when there is a proven, accurate and efficient means of measurement. [EPA-HQ-OAR-2010-0799-9547-A1, p.7]

Organization: Kia Motors

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 101.]

Sort of the technical side, based on research that we have conducted, Kia believes the methods suggested by the agencies for nitrous oxide which must be measured starting in 2013 are not fully proven and developed. Kia prefers the bag method analysis of measurement to minimize reduction of testing throughout. However, the NDIR and FTIR bag analysis methods currently have repeatability and practicality concerns. We support the measurement but recommend that it be revisited in a time when there is improved and accurate and more efficient means available.

Organization: Toyota Motor North America

N_2O Measurement - Toyota remains concerned that EPA has not provided sufficient time for manufacturers to incorporate accurate and robust N_2O measurement capabilities into their test sites. N_2O measurement currently has no accurate measurement technology available that is suitable for high-volume testing at this time. Toyota fully supports the comments and recommendations submitted by the Alliance on this matter. [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

In the proposed regulation paragraphs 40 CFR §86.1823-08(m)(2)(iii) and §86.182901(b)(I)(iii)(G), EPA proposes to extend the use of alternative N_2O deterioration factors (DF's) and N_2O compliance statements, respectively, through the 2016 model year. Toyota appreciates EPA's consideration in extending these deadlines, and supports the Alliance recommendation that the use of alternate N_2O DFs and compliance statements be further extended until the establishment of proper N_2O measurement instrumentation and procedures. Furthermore, because accurate N_2O measurement technology is not readily available, Toyota requests that EPA extend the N_2O compliance statement beyond the 2016 model year, up until the establishment of proper N_2O measurement instrumentation and procedures has been demonstrated. [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

Due to the fact that accurate N_2O measurement technology is not readily available, Toyota requests that EPA should exclude N_2O measurement and reporting from in-use testing for all model years and test groups that certify to the N_2O standards via a compliance statement. We support the Alliance comments on this matter. [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

Organization: Volvo Car Corporation (VCC)

'EPA is also finalizing standards that will cap tailpipe nitrous oxide (N_2O) and methane (CH_4) emissions at 0.010 and 0.030 grams per mile, respectively. Even after adjusting for the higher relative global warming potencies of these two compounds, nitrous oxide and methane emissions represent less than one percent of overall vehicle greenhouse gas emissions from new vehicles. Accordingly, the goal of these two standards is to limit any potential increases of tailpipe emissions of these compounds in the future but not to force reductions relative to today's low levels.' [EPA-HQ-OAR-2010-0799-9551-A2, p. 11]

In the final Rule, EPA focuses on four important aspects of N_2O and CH_4:

• EPA wants a cap

• N_2O and CH_4 are two strong GHG emissions

• EPA wants to ensure that N_2O and CH_4 do not increase as a consequence of the introduction of new technologies.

• N_2O and CH_4 represent less than 1% of the GHG gases from the vehicle [EPA-HQ-OAR-2010-0799-9551-A2, p. 11]

To monitor these potent greenhouse gases against a given value is reasonable when it is not possible to predict the consequences that new technology can generate. However, it is a significant difference, via a statement providing a declaration of compliance in accordance with the standard instead of conducting a full certification and the subsequent protocol. [EPA-HQ-OAR-2010-0799-9551-A2, p. 11]

It also should be considered that, as noted above, N_2O and CH_4 represent only 1% of the guarded carbonaceous compounds that make up a manufacturer CREE value. [EPA-HQ-OAR-2010-0799-9551-A2, p. 11]

Currently, there is no equipment on the market that can measure according to proper certifying standard, using 'bag measurement' for N_2O with a relevant repeatability. During 2012-2013, new technology will be introduced to the market, but this technology is still in the research stage, and it would be premature to commit to its use as a certification tool at this time. VCC is concerned about technology readiness, instrument availability, measurement accuracy, and implementation lead time, including verifying that the instrument is robust enough for certification testing. [EPA-HQ-OAR-2010-0799-9551-A2, p. 11]

VCC would like to ask EPA, in collaboration with CARB, to consider continuing the practice used today (fulfillment of CAP through a written statement). VCC does not think manufacturers should have to certify N_2O in accordance with procedures similar as those of Criteria Emission. [EPA-HQ-OAR-2010-0799-9551-A2, p. 11]

The above-required instrumentation to be able to measure N_2O in certification facility (bag measurement) at the level of 10 mg/mi with a adequate accuracy, is not available on the market today. It will probably be possible to order it during 2012. After the order is completed, the installation process will take place somewhere in 2013 and method development will be initiated which will require some development work for 1-2 years at least. [EPA-HQ-OAR-2010-0799-9551-A2, pp. 11-12]

Response:

EPA is finalizing the additional lead-time for N_2O testing essentially as proposed. In response to Alliance comments, EPA is temporarily (for MYs 2017 and 2018) allowing manufacturers to continue to use compliance statements for test groups certified using carry-over data. EPA is also clarifying, in response to Alliance comments, that manufacturers will not be required to conduct in-use testing for vehicle test groups certified using a compliance statement. Section III.B.9.b of the preamble provides EPA's response to the comments received regarding N_2O measurement timing and issues.

Ferrari commented that small volume manufacturers should not be required to measure N_2O. Ferrari raises issues that are essentially the same as those raised by large volume manufacturers, which EPA has addressed in the preamble as noted above. Ferrari does not provide any rationale why the sales volume of a manufacturer would be relevant to the manufacturer's ability to measure N_2O with the lead time being provided. Also, EPA did not receive similar comments from manufacturers that are currently SVMs in the GHG program. EPA does not know of any reason, nor did Ferrari provide one, why SVMs, which are large companies with limited sales in the U.S., would not be able to measure N_2O in the same time-frame as the large volume manufacturers and therefore is not differentiating between large and small volume manufacturers with regard to N_2O measurement.

In response to Alliance comments regarding N_2O testing for heavy-duty vehicles, EPA did not propose or request comment on heavy-duty vehicle issues in this rulemaking and therefore making changes to the heavy-duty vehicle requirements is beyond the scope of this rule. However, EPA understands the issue raised by the Alliance and plans to consider heavy-duty vehicle N_2O testing as part of a future action.

10.2.3. N_2O and CH_4 Standards Related Comments

Organizations Included in this Section

America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)
Ferrari
Manufacturers of Emission Controls Association (MECA)
Vehicle Production Group LLC (VPG)

Organization: America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)

Methane Global Warming Potential

Citing the IPCC Fourth Assessment Report, EPA's uses a Global Warming Potential ("GWP") factor of 25 for the Proposed LD Rule's methane emissions standards: "CH_4 has a 100-year GWP of 25 according to the 2007 IPCC AR4." 76 FR 74993, n.236. [EPA-HQ-OAR-2010-0799-9548-A1, p. 9]

However, while EPA uses the 25 GWP for mobile sources, the rest of EPA's Office of Air and Radiation uses a GWP of 21 for stationary source methane emission standards. See, e.g., the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 FR 31519, 31522, June 3, 2010 ("CH_4 has a GWP of 21"); PSD Permit Number PSD-TX-1244-GHG, issued November 10, 2011 by EPA Region VI for the Lower Colorado River Authority Thomas Ferguson Power Plant, p. 7 (mass-based methane emissions limits of 16.8 and 16.2 tons per year are each multiplied by 21 to establish CO_2 -equivalent emissions limits of 353.3 and 327.2 tpy; attached as Exhibit 6.) [EPA-HQ-OAR-2010-0799-9548-A1, p. 9]

In other words, the proposed LD Rule arbitrarily deems vehicle methane emissions as having 19% greater heat-trapping characteristics than the chemically identical molecules emitted from stationary sources. Unless EPA can explain the scientific basis for this, light duty vehicle methane emissions should be regulated with the same GWP as all other U.S. methane sources. [EPA-HQ-OAR-2010-0799-9548-A1, p. 9]

Organization: Ferrari

Ferrari supports the EPA proposal not to increase the stringency of the CH_4 and N_2O standards set forth in the MYs 2012-16 GHG final rule. [EPA-HQ-OAR-2010-0799-9535-A2, p.2]

Organization: Manufacturers of Emission Controls Association (MECA)

Tightening of hydrocarbon and CO_2 emission standards over time with the parallel introduction of more effective emission control systems have resulted in lower emissions of N_2O and CH_4 from today's vehicles compared to older vehicles certified to less stringent hydrocarbon and CO_2 standards. The performance of advanced emission control technologies for advanced diesel, gasoline, and natural gas-fueled powertrains can also be optimized to minimize N_2O and CH_4 emissions from future light-duty vehicles consistent with the limits EPA set for these important greenhouse gas emissions in their first round of light-duty vehicle greenhouse gas emission standards. [EPA-HQ-OAR-2010-0799-9452-A3, p.3]

Organization: Vehicle Production Group LLC (VPG)

Methane emissions

In order for the industry to achieve expanded use of CNG as an automotive fuel, in VPG's opinion, the methane standard must be revisited relative to CNG fuel usage and emissions from CNG fueled engines. We do not believe that the methane emissions standards advised in III.6. are in line with methane emissions from vehicles running on natural gas. Table 2 details the emissions for two dedicated CNG fueled vehicles as well as VPG's gasoline fueled MV-1 as a reference point. [See Table 2. Methane emissions from one gasoline and two CNG certification tests in Docket number EPA-HQ-OAR-2010-0799-7985-A2, p. 4] [EPA-HQ-OAR-2010-0799-7985-A2, p. 3]

VPG notes that, as can be expected, gasoline emissions of methane are significantly less than the new standard. More significantly though, VPG's MV-1 is certified as a LDT 4 light duty truck, and has a curb weight of 5250 pounds, yet it is certified at the bin 2 level. Even at this clean certification level, the MV- 1 is does not meet the methane standard. [EPA-HQ-OAR-2010-0799-7985-A2, p. 4]

Additional methane emissions data do not appear to be available in certificate summary information reports for CNG fueled vehicles accessed through the EPA Document Index System (DIS). One of the better known OEM vehicles certified for dedicated CNG use is the Honda Civic. The methane results for this vehicle however (test group BHNXV01.8BDT) are not available from the DIS on the EPA website. [EPA-HQ-OAR-2010-0799-7985-A2, p. 4]

Our evidence indicates that a there are technological feasibility issues with methane standards at the current level for CNG fueled vehicles with engines of a displacement similar to VPG's. VPG requests a review of the CH_4 standard as applied to dedicated CNG fueled vehicles. [EPA-HQ-OAR-2010-0799-7985-A2, p. 4]

Finally, VPG recommends a review of the methane emissions standards as applied to CNG fueled vehicles. [EPA-HQ-OAR-2010-0799-7985-A2, p. 4]

Response:

In response to AGA and ANGA comments concerning the global warming potential (GWP of CH_4, the GWPs used in this rule are consistent with the 100-year time frame values in the 2007 Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4). These AR4 values are based on latest science from the IPCC, they are consistent with the values used in the MYs 2012-2016 LD and MYs 2014-2018 HD rulemakings, and we consider them to be the most appropriate values for this rule. At this time, the 100-year GWP values from the 1995 IPCC Second Assessment Report (SAR) are used in the official U.S. GHG inventory submission to the United Nations Framework Convention on Climate Change (UNFCCC) per the reporting requirements under that international convention. As the commenters note, some EPA programs use SAR values since they have deemed consistency with the national GHG inventory and other relevant programs to be appropriate for their purposes. For example, the GWP of 21 was used in a recent oil and gas rulemaking in order to maintain consistency with the SAR GWP values used in the national GHG inventory and in the US Greenhouse Gas Reporting Program, which collects data from emitters in that sector. The UNFCCC recently agreed on revisions to the national GHG inventory reporting requirements, and will begin using the 100-year GWP values from AR4 for inventory submissions in the future.

Commenters generally supported EPA's proposal not to change the CH_4 standards and supported the flexibilities discussed in section 10.2.1 above. VPG commented that the CH_4 standard established in the MY 2012-2016 rule should be revisited for CNG vehicles. VPG mentions not being able to find the CH_4 data for the Honda dedicated CNG vehicle in the certification data. In response, EPA believes that CH_4 can be controlled through emissions systems optimization and continues to believe that the CH_4 standard previously established is feasible and appropriate. As noted in comments submitted by the Manufacturers of Emission Controls Association (MECA), the performance of advanced emission control technologies for advanced diesel, gasoline, and natural gas-fueled powertrains can also be optimized to minimize N_2O and CH_4 emissions from future light-duty vehicles consistent with the limits EPA has set. The Honda dedicated CNG vehicle provides an example of the potential for CH_4 emissions control, with a certification value of 0.015 compared to a CH_4 standard of 0.03 g/mile.[21]

In addition, EPA is providing the flexibility to use CO_2 credits on a CO_2-equivalent basis to address excess CH4 emissions. Several commenters from the natural gas industry commented in support of these provisions (see 10.2.1, above). VNG Co commented that "the flexibility may be useful for manufacturers of NGVs, particularly converters that will be important in developing the market in the early years. Because small quantities of unburned natural gas from NGV engines may be emitted as methane, NGVs may have slightly higher emissions of this GHG than petroleum-fueled ICE vehicles. However, due to much greater reductions of CO_2 emissions, NGVs still yield net GHG emission reductions of approximately 24 percent. These flexible compliance rules will ensure that net GHG reductions are accounted for properly, and automakers are not penalized so long as slight increases in methane emissions are offset by CO_2 over-compliance." America's Natural Gas Alliance (ANGA) and American Gas Association (AGA) also commented in support of this flexibility. EPA concurs with these comments.

[21] MY 2012 certification data is available at: http://www.epa.gov/otaq/crttst.htm.

EPA notes further that manufacturers that are small businesses remain exempt from meeting the N_2O and CH_4 standards as well as the CO_2 standards under the MY2017-2025 program, as with the MY 2012-2016 program. It is EPA's understanding that VPG currently qualifies as a small business.

Comments regarding CH_4 and N_2O standards as they apply to police and emergency vehicles are addressed in section 10.5 below.

10.3. Alternative CO_2 Standards for Small Volume Manufacturers with U.S. Sales below 5,000 Vehicles

Organizations Included in this Section

Association of Global Automakers, Inc. (Global Automakers)
Aston Martin Lagonda Limited, Lotus Cars Limited and McLaren Automotive
Ferrari
Ferrari & Maserati of Seattle
Ferrari of Houston, Texas and Ferrari of Austin, Texas
Miller Motorcars
Penske Corporation
Volkswagen Group of America
Wide World Ferrari, Wide World of Cars, LLC

Organization: Association of Global Automakers, Inc. (Global Automakers)

Global Automakers supports the approach proposed by EPA to establish small volume manufacturer standards on a company-specific basis. The approach provides the compliance flexibility that this small segment of the industry needs while also contributing to the control of GHG emissions. This approach would be most efficiently administered if manufacturers may petition for, and EPA grants, alternative standards for multiple model years in a single proceeding. Such standards should be issued at least 18 months prior to the first affected model year. We also urge EPA and NHTSA to work cooperatively to harmonize CAFE and GHG standards for these small companies. [EPA-HQ-OAR-2010-0799-9466-A1, p. 8]

Also with regard to the issue of small volume manufacturers, Global Automakers strongly supports including regulatory language in the final rules that would amend the existing 40 CFR 86.1838(b) regarding small volume manufacturers to include the criteria set forth in the preamble to this regulatory package at 76 FR 74992 (middle column). These criteria would allow a manufacturer to retain SVM status if it can demonstrate that it is 'operationally independent' from another manufacturer that may have an ownership interest in that manufacturer. [EPA-HQ-OAR-2010-0799-9466-A1, p. 8]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 52.]

Additionally, Global Automakers supports the case-by-case small-volume manufacturers' approach as well as harmonization of the definitions for small-volume manufacturers. The case-by-case approach allows the flexibility that this small segment of the industry needs while maintaining requirements necessary to control greenhouse emissions.

Inclusion of the criteria included in the above referenced preamble text would provide necessary flexibility for historically independent small manufacturers, while the criteria are sufficiently stringent (e.g., strict limits on the total vehicles sold in the US, no joint ownership of intellectual property by the manufacturers, separate R&D, testing, and development facilities, independent verification, etc) so that there would be virtually no ability to abuse this provision. In addition, any manufacturer that meets the criteria set forth in the preamble would still need to comply with the provisions applicable to all SVMs. [EPA-HQ-OAR-2010-0799-9466-A1, p. 8]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 68.]

And, finally, Global Automakers supports the case-by-case small volume manufacturers approach. It allows the flexibility that this small segment of the industry needs while also mandating requirements necessary to control greenhouse gases. We also support the harmonization of the definition of small volume manufacturers.

Organization: Aston Martin Lagonda Limited, Lotus Cars Limited and McLaren Automotive

This comment is submitted on behalf of Aston Martin Lagonda Limited, Lotus Cars Limited and McLaren Automotive Limited. Each of these companies is classified as a “small volume manufacturer” (SVM) under EPA regulations and is a manufacturer of a very limited number of high performance sports cars. See www.astonmartin.com; www.lotuscars.com; www.mclarenautomotive.com. [EPA-HQ-OAR-2010-0799-5387-A2, p. 1]

We present here the viewpoint of SVMs as regards EPA’s proposal to establish MY 2017-2025 GHG standards for light-duty vehicles.2 All three manufacturers understand the need to control CO_2 and support the regulatory efforts of EPA and NHTSA. The three companies further believe that small manufacturers must do their fair share to reduce GHGs. [EPA-HQ-OAR-2010-0799-5387-A2, p. 1]

SVMs agree with both the rationale and goal behind the NPRM’s SVM provisions and urge EPA to promulgate the proposed mechanism to set SVM GHG standards on an SVM-by-SVM basis. [EPA-HQ-OAR-2010-0799-5387-A2, p. 3]

As recognized by EPA, the case-by-case SVM approach is already found in the CAFÉ law (49 USC 32902), the EU small volume manufacturer CO_2 derogation, and both the California existing GHG provision (13 CCR 1961.1) as well as in the recently proposed Advanced Clean Car rule. Adopting the case-by-case SVM GHG mechanism would thus align EPA’s approach with that of NHTSA, the EU, and CARB, furthering the desirable objective of harmonization. [EPA-HQ-OAR-2010-0799-5387-A2, p. 3]

EPA has requested comments on allowing SVMs to apply for a case by case standard for model years prior to MY 2017. We fully support the idea of allowing optional application for a case-by-case standard starting with MY 2015 (with application being made no later than July 2013). [EPA-HQ-OAR-2010-0799-5387-A2, p. 3]

CONCLUSION: The proposed case-by-case SVM mechanism is fair and equitable and also meets the necessary goal of appropriate control of GHG. The SVM provisions should be promulgated as proposed with optional early opt in starting in MY 2015.

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 118-119.]

---

2 The three companies submitting this comment take no position on the issue of expanding the GHG SVM rule to small manufacturers that are part of larger groups and are operationally independent.

Organization: Ferrari

Ferrari fully supports EPA's proposal to establish a method for a vehicle manufacturer to demonstrate "operational independence" if, under EPA regulations, the manufacturer's sales otherwise would have to be aggregated with those of another vehicle manufacturer. Finalizing this provision will benefit truly small, historically independent vehicle manufacturers while still protecting the environment and minimizing vehicle greenhouse gas ("GHG") emissions. As proposed, the proposed criteria enumerated at 76 Fed. Reg, 74,992 (middle column) are fully sufficient to prevent vehicle manufacturers from "gaming" the system, yet still offer necessary flexibility for individual vehicle manufacturers with unique ownership and operational structures. [EPA-HQ-OAR-2010-0799-9535-A2, pp.1-2]

Despite the Ownership Structure, Ferrari is Uniquely Positioned as an Operationally Independent Vehicle Manufacturer. [EPA-HQ-OAR-2010-0799-9535-A2, p.2]

The existing 40 CFR § 86.1838(b), which governs small volume manufacturer ("SVM") certification procedures, includes a provision regarding "aggregation" of sales which is based on the percentage ownership of the SVM by another vehicle manufacturer. Sales of the two manufacturers are aggregated when another manufacturer owns more than 10% of the smaller manufacturer. At the present time Fiat SpA) owns 90i% of Ferrari SpA. Due to the transactions that occurred in 2009 regarding Fiat, the U.S. government and Chrysler Group LLC [[EPA-HQ-OAR-2010-0799-10037-A2]], a unit of Fiat SpA now owns more than 10% of Chrysler. As an unintended consequence of these transactions, Ferrari could lose its status as an SVM, which it has historically held. If that were to occur, the result would be devastating to Ferrari since it would need to immediately change its certification, durability testing, as well as making it part of a large volume manufacturer for purposes of the GHG rules. This consequence could severely limit Ferrari in the U.S. market, despite aggressive efforts to reduce GHG emissions from vehicles sold in the U.S. It also would ignore the reality of how Ferrari and Fiat operate. For the 60 years of Ferrari's existence, the company has always operated independently of any parent company or other ownership structure. [EPA-HQ-OAR-2010-0799-9535-A2, p.2]

Specifically, Ferrari has complete design autonomy from Fiat and every other company in the Fiat Automobiles group, including Chrysler. Overall vehicle and powertrain design is overseen from the Ferrari Maranello facility; no Fiat personnel are involved in any way with this operation. Ferrari is exclusively in charge of all Ferrari research and development, with no participation or assistance from Fiat. Ferrari's budget for R&D is set by Ferrari and is independent of any R&D budget for Fiat. Ferrari parts design and procurement are completely independent of Fiat Automotive's procurement operations. Ferrari engine and transmission design, machining and production, as well as body, paint, interior and final assembly are all performed at the Maranello facility— again, completely independent of Fiat design, machining, production, and assembly. All Ferrari vehicle testing, evaluation, emission certification and documentation are all performed at Maranello, completely independent of Fiat testing, certification, and other operations. Marketing, competitive racing and other actions to promote the Ferrari brand are all handled by exclusively by Ferrari without control by Fiat. Overall management of Ferrari is independent from Fiat. While there are a small number of individuals from Fiat SpA who are on Ferrari's Board of Directors, these individuals (separately or combined) are not able to exercise exclusive management control over Ferrari or Fiat. In sum, despite the ownership of stock, Ferrari operates on a day-to-day and model year-to-model year basis as an entity that is entirely separate from Fiat. [EPA-HQ-OAR-2010-0799-9535-A2, p.2]

Furthermore, EPA states in the proposal: [EPA-HQ-OAR-2010-0799-9535-A2, p.3]

[A] small manufacturer under the umbrella of a large manufacturer is fundamentally different from other SVMs because the large manufacturer has several options under the GHG program to bring the smaller subsidiary into compliance, including the use of averaging or credit transfer provisions, purchasing credits from another manufacturer, or providing technical and financial assistance to the smaller subsidiary. [EPA-HQ-OAR-2010-0799-9535-A2, p.3]

While this may be true in other circumstances, the ownership structure between Fiat and Ferrari provides Ferrari with little, if any, preferential access to any credits generated by Fiat. As explained above, under the long-standing arrangement between the two companies, Fiat does not provide financial or technical assistance to Ferrari. Any such transactions between the two companies would be at arms-length and no different than if the two companies had no common ownership. Ferrari therefore obtains no preference or benefits through its association with Fiat that would advantage Ferrari compared to other SVMs. [EPA-HQ-OAR-2010-0799-9535-A2, p.3]

Establishing an "Operational Independence" Option Would Be Consistent with Past EPA and California Air Resources Board Practice. [EPA-HQ-OAR-2010-0799-9535-A2, p.3]

Over the past ten years in determinations under the existing EPA SVM regulations, the Highway Safety Act, and the California Air Resources Board ("CARB") regulations, Ferrari has consistently been determined to be an independent SVM. Even in the early 2000s, when General

Motors owned 20% of Fiat, EPA determined under the then existing SVM regulations, which are comparable to the current SVM certification provision that Ferrari was an independent SVM. The National Highway Traffic Safety Administration ("NHTSA") has made similar determinations under the Safety Act. CARB has also considered Ferrari an independent SVM for purposes of their vehicle tailpipe emissions and on-board diagnostic ("OBD") programs. Thus, establishing criteria by which a manufacturer can demonstrate that it is operationally independent would be fully consistent with past EPA, NHTSA, and CARB practice. [EPA-HQ-OAR-2010-0799-9535-A2, p.3]

The Proposed Criteria Are Stringent And Will Not Encourage "Gaming" of the System. [EPA-HQ-OAR-2010-0799-9535-A2, p.3]

EPA requested comment on the agency's concern that some manufacturers could "change their corporate structure to take advantage of such provisions (that is, gaming)." Ferrari supports the proposed criteria for establishing operational independence and believes that they are sufficiently stringent to prevent some manufacturer from attempting to "game" the system. In order to attempt to restructure an existing corporate situation, Ferrari believes the cost of separating all, R&D, production and testing facilities from the parent company, along with the expense of developing completely new powertrains and platforms, would be prohibitively expensive. The cost of purchasing any jointly-held patents also could be astronomical. Depending on the company, separating all business, administration, legal, purchasing, sales, and marketing functions also could be complicated and cost prohibitive. [EPA-HQ-OAR-2010-0799-9535-A2, pp.3-4]

Finally, the "new" manufacturer would have to maintain this status for two full years prior to applying for operational independence SVM status. During this time, the new manufacturer presumably would have to comply with the applicable GHG emission standards without any support from the manufacturer from which it is newly separated. The new manufacturer would not be eligible to apply for and comply with the more flexible case-by-case SVM standards that EPA has proposed. Given that there would be little benefit to a large manufacturer to spin off and separate a model line that over-complies with the applicable GHG standard, the new manufacturer would likely not be in compliance with the GHG standards during this two-year period. Even with the credit carry-forward/carry-back options, it would be exceedingly difficult for a new manufacturer to make up this credit deficit if and when it is deemed an operationally-independent SVM without purchasing credits (which may be a very difficult task, given the stringency of the proposed GHG standards for these MYs). In addition, if the newly-created SVM applied for case-by-case standards, EPA intends to establish such standards at a "challenging but less stringent" level; thus, the SVM would not be generating large numbers of credits for each model year that could make up for two years of likely credit deficits. [EPA-HQ-OAR-2010-0799-9535-A2, p.4]

Overall, there do not appear to be any scenarios where it would make financial or operating sense for a large manufacturer to try to take advantage of the operational independence criteria to "spin-off" fewer than 5000 vehicles per year. EPA also has the authority to deny an application for operational independent SVM status and can address any concerns about gaming during the application and approval process. Because we believe that opportunities for gaming the system are minimal at best, and that EPA will be able to adequately identify such circumstances, Ferrari recommends that EPA finalize the operational independence criteria with only one small revision. [EPA-HQ-OAR-2010-0799-9535-A2, p.4]

In order to eliminate any confusion regarding the meaning of the requirement, Ferrari recommends that EPA revise the proposed 40 CFR § 86.1838-01(b)(4)(a)(iii) as follows: [EPA-HQ-OAR-2010-0799-9535-A2, p.4]

(iii) ~~related manufacturers~~ the applicant does not use any vehicle powertrains or platforms developed or produced by related manufacturers. [EPA-HQ-OAR-2010-0799-9535-A2, p.4]

This minor change will clarify that the applicant for operationally independent SVM status does not rely on other, related manufacturers for powertrains or other vehicle platforms. However, the revision would enable the applicant to sell, consistent with (i) and (vii), parts and components to a related manufacturer through an open market process at competitive pricing. [EPA-HQ-OAR-2010-0799-9535-A2, pp.4-5]

An Operational Independence Option Will Have Little Overall Effect on Vehicle GHG Emissions. [EPA-HQ-OAR-2010-0799-9535-A2, p.5]

EPA's proposal to allow an operationally-independent manufacturer to be considered an SVM for purposes of the GHG program will have very little overall effect on vehicle GHG emissions. As noted above, Ferrari sells approximately 1500-1800 vehicles in the U.S. each year. Under the MY 2012-2016 rules, Ferrari would need to make the requisite showing in 40 CFR § 1801-12(k), and under the proposal for MY 2017-2025, as an SVM, Ferrari could seek alternative, case-by-case standards for its fleet. EPA explained in the preamble that the SVM case-by-case standards are still intended to be challenging, will still require innovation and development of new technologies, and will still require the SVM to do its "fair share" of reducing emissions.5 As proposed, the process of obtaining SVM-specific standards includes a comprehensive evaluation of all aspects of the SVM's fleet, use of technology, and projections of sales and introduction of new models covering up to five model years. This process will enable EPA and the manufacturer to develop SVM-specific standards that are protective of the environment and require technological innovation while reflecting the unique characteristics of the SVM's fleet of vehicles. Ferrari supports the approach EPA has proposed and notes that it is consistent in concept with the system used in the European Union. [EPA-HQ-OAR-2010-0799-9535-A2, p.5]

The Provision on "Attest Engagements" Should Mirror the Provision Contained in EPA's Regulations on Fuel and Fuel Additives. [EPA-HQ-OAR-2010-0799-9535-A2, p.5]

EPA requested comments on whether to require a manufacturer seeking operationally independent SVM status to provide an "attest engagement" from an independent auditor, verifying the accuracy of the information contained in the manufacturer's application. Ferrari supports this concept and recommends that EPA adopt a provision that is comparable to the provision in the agency's Fuel and Fuel Additive regulations in 40 C.F.R. Part 80. In those regulations, EPA requires refiners and fuel importers subject to Subpart F of 40 C.F.R. Part 80 to engage an outside auditor to verify information. Section 80.125 specifies that the CPA shall perform the attest engagement in accordance with the Statements on Standards for Attestation Engagements, which is incorporated by reference, and allows the assistance of internal auditors who are employees or agents of the regulated company, as long as such assistance is consistent with the guidelines contained in the Statements on Standards for Attestation Engagements. This provision further allows the attest engagement to be completed by an auditor who is an employee of the regulated company, provided that the employee is an internal auditor certified by the Institute of Internal Auditors and completes the internal audits in accordance with the Codification of Standards for the Professional Practice of Internal Auditing. Adopting these requirements into the process for demonstrating operational independence will allow some measure of flexibility for the manufacturer while ensuring the accuracy of the information and the independence of the auditor. Furthermore, Ferrari recommends that EPA clarify in the final rule that the auditor performing the attest engagement does not have to be a new auditor hired solely for the purposes of conducting this audit. Rather, EPA should allow a manufacturer to continue to use a CPA or other auditor who has previously performed similar functions for the company, as long as the auditor meets the requirements discussed above. Finally, since a number of the criteria listed in the preamble involve engineering issues, Ferrari suggests that the entity performing the Attest Engagement be allowed to use personnel from outside its organization as necessary to assist in this effort. [EPA-HQ-OAR-2010-0799-9535-A2, pp.5-6]

EPA Should Allow a Time Period for Adjustment If a Manufacturer's Situation Changes. [EPA-HQ-OAR-2010-0799-9535-A2, p.6]

EPA has asked for comment on what should occur in the event a manufacturer who is an SVM has changed circumstances that would no longer make it eligible for this status. While Ferrari does not anticipate this occurring, if its status or other SVM's status should change, EPA should provide at least a three-year transition period to allow the manufacturer to develop the additional testing facilities and time for durability testing, as well as for software, hardware development and installation. Such a period will be needed, since it is highly unlikely that any SVM would be able to immediately transition from this status to that of a full-line manufacturer. [EPA-HQ-OAR-2010-0799-9535-A2, p.6]

Inclusion of a revision to 40 CFR § 86.1838(b) to provide for "operational independence" in this package of rules is critically important to Ferrari. As such, Ferrari strongly supports including such a provision in the final rule. Attached is proposed text of such a revision. [EPA-HQ-OAR-2010-0799-9535-A2, p.6]

Ferrari agrees with many parts and principles of the proposed regulations, including the specific provisions for small-volume manufacturers contained in the EPA GHG proposal. We deem that the proposed approach to define specific standards for each single SVM is the best solution, because it is possible to take into account the potential technical and economic capabilities of each small-volume manufacturer. Moreover, this method is consistent with both the already existing CAFE regulation that allows small manufacturers to petition NHTSA for alternative fuel economy standards, and also the corresponding European Union Regulation 443/2009/EC on CO_2. [EPA-HQ-OAR-2010-0799-9535-A2, p.10]

As noted in the main comments, we strongly recommend introducing the concept of "operational independence" for small-volume manufacturers, so that the specific standards reserved to SVMs can also be used by this sub-category of small-volume manufacturers that operate independently from any other companies, in spite of ownership interests. [EPA-HQ-OAR-2010-0799-9535-A2, p.10]

NHTSA's proposed standards will require passenger cars to meet an estimated average of 49.6 mpg in MY 2025. This represents an average annual increase of 5 percent from the 34.4 mpg average for 2016 MY. [EPA-HQ-OAR-2010-0799-9535-A2, p.14]

With reference to the final 2010 MY Ferrari CAFE of 18.3 mpg (the best ever so far) we would need to increase our CAFE by approximately 108 % in MY 2017 up to 191 % in MY 2025. We are confident to achieve remarkable improvements in the fuel economy and reductions of CO_2 emissions with new models which will benefit of further improvements and other technologies in the future, but we cannot satisfy the proposed targets and percentages. [EPA-HQ-OAR-2010-0799-9535-A2, p.14]

Organization: Ferrari & Maserati of Seattle

We therefore urge EPA to finalize the criteria that would enable a very small volume manufacturer (SVM), such as Ferrari, to demonstrate that it is operationally independent from related manufacturers and comply with company-specific fleet average greenhouse gas (GHG) emission standards. [EPA-HQ-OAR-2010-0799-9197-A2, p. 1]

Existing EPA regulations require sales to be aggregated when one vehicle manufacturer holds more than a 10% interest in another manufacturer. In the proposed rule, EPA included a list of criteria that a SVM could satisfy in order to demonstrate that it is operationally independent, despite the ownership structure that would otherwise require sales aggregation. See pages 74,991-92 of the proposed rule. These criteria are stringent enough to prevent gaming of the system, yet would provide a manufacturer like Ferrari with the necessary flexibility to comply with case-by-case GHG emission standards. Given the very low number of Ferraris sold in the U.S. each year, the proposal would have only negligible effects on overall vehicle GHG emissions. If EPA does not finalize the operational independence criteria and Ferrari's sales must be aggregated with sales of Fiat in the U.S., sales of Ferrari may be reduced. This would have a devastating effect on our business and our employees. [EPA-HQ-OAR-2010-0799-9197-A2, p. 1]

Organization: Ferrari of Houston, Texas and Ferrari of Austin, Texas

In the December 2011 proposal EPA proposed criteria that would allow a vehicle manufacturer to demonstrate that it is 'operationally independent' from other related vehicle manufacturers (see pages 74,991-92). EPA Regulations currently require sales to be aggregated if a vehicle manufacturer owns a 10% or greater share in another manufacturer. The operational independence criteria would allow a qualifying manufacturer to be treated as a small volume manufacturer (SVM) for the purposes of GHG regulations, including compliance with challenging case-by-case emission standards instead of the fleet average standards that would otherwise apply. Ferrari of Houston and Ferrari of Austin urge EPA to finalize this option. [EPA-HQ-OAR-2010-0799-9230-A2, p.1]

EPA's proposal would establish a rigorous process to ensure that a manufacturer applying to be treated as an operationally-independent SVM is truly an independent entity. [EPA-HQ-OAR-2010-0799-9230-A2, p.1]

Opportunities to game the system would be limited and, given the very small number of vehicles that Ferrari sells each year in the U.S., the effect on the overall vehicle GHG emissions would be miniscule. [EPA-HQ-OAR-2010-0799-9230-A2, p.2]

However, without this option, the U.S. sales of Ferrari and Fiat would have to be aggregated. Aggregation would restrict Ferrari's ability to sell vehicles in the U.S., which would be harmful to our business, our employees, and our vendors and suppliers. EPA should therefore finalize the operational independence criteria and provide necessary flexibility to SVMs that can demonstrate independence from any related manufacturers. [EPA-HQ-OAR-2010-0799-9230-A2, p.2]

Organization: Miller Motorcars

EPA has proposed to allow a manufacturer to comply with the small volume manufacturer (SVM) GHG emission standards if the manufacturer can show that it is 'operationally independent' from other related manufacturers. Under current EPA regulations, sales of two related vehicle manufacturers must be aggregated if there is common ownership of 10% or more. The EPA proposal would suspend the aggregation requirement if specific, stringent criteria can be satisfied. The proposal would provide needed flexibility for very small manufacturers, like Ferrari, that are fully independent from any related companies. No environmental harm would ensue since the SVM would have to comply with case-by-case GHG emission standards that EPA intends to be challenging yet achievable. At the same time, EPA has proposed criteria that are difficult to satisfy and which will prevent companies from trying to take advantage of the provision or game the system. Without this option, Ferrari may be forced to reduce or limit U.S. vehicle sales, which would adversely affect our business and our employees. Miller Motorcars therefore urges EPA to finalize this option. [EPA-HQ-OAR-2010-0799-8141-A2, p. 1]

Organization: Penske Corporation

Ferrari of Scottsdale, Ferrari of Central Jersey, and Ferrari of Las Vegas support EPA's proposal to allow a manufacturer to demonstrate that it is 'operationally independent' from the other automobile manufacturers with which its sales would otherwise have to be aggregated under existing EPA regulations. As a small volume manufacturer (SVM), the manufacturer would then be able to apply for and comply with case-by-case GHG emission standards that reflect the degree of GHG emissions reduction that is challenging but still achievable for the manufacturer's fleet. This option would provide necessary flexibility for those small volume manufacturers that are truly independent from other automobile manufacturers in their operations and ensure that Ferrari's ability to sell vehicles in the U.S. is preserved. [EPA-HQ-OAR-2010-0799-9187-A2, p. 1]

If Ferrari does not obtain SVM status and the sale of Ferraris is restricted, then our Ferrari business could suffer greatly. Even a modest reduction in the number of vehicles that Ferrari is able to sell in the U.S. in a given model year could have a substantial impact on these Ferrari dealers and the number of employees we are able to sustain. [EPA-HQ-OAR-2010-0799-9187-A2, p. 2]

Thus, Ferrari of Scottsdale, Ferrari of Central Jersey, and Ferrari of Las Vegas urge EPA to finalize the option described on page 74,992 of the proposal to demonstrate operational independence. EPA has proposed stringent criteria that will ensure that a manufacturer seeking to establish operational independence is truly independent. As proposed, the criteria and application process would make it extraordinarily difficult for a manufacturer to change its existing business operation in order to take advantage of the flexibility granted to SVMs. The proposal also would be protective of the environment, as the agency would set case-by-case GHG emissions standards for a SVM that would be challenging yet achievable. [EPA-HQ-OAR-2010-0799-9187-A2, p. 2]

Organization: Volkswagen Group of America

In the NPRM the agencies seek comment on the concept of operational independence for Small Volume Manufacturers (SVM), whereby a captured small volume brand that is more than 10% owned by another company could petition the agencies for SVM status based on an attestation and demonstration of operational independence. As an operationally independent small volume manufacturer, a company would then have the option to petition the agencies for a negotiated CO_2 and fuel economy standard. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 28-29]

Volkswagen supports the concept of allowing a captured brand with less than 5,000 annual vehicle sales to have the flexibility to petition for SVM status. However, Volkswagen is concerned that the operational independence criteria listed in the NPRM is too prescriptive and difficult to apply across all circumstances of captured small volume brands. For example, while it may be common for a small volume brand to use a common platform or engine from a parent company, in many cases these systems are altered to accommodate separate features or performance characteristics. In addition, such major components would be part of a business contract and not merely provided gratis to different brands within a group. As such Volkswagen requests that EPA and NHTSA allow this flexibility for demonstration of operational independence in the final regulation but requests that the agencies consider the operational independence of each manufacturer on an individual basis during the petition process. As such the degree of independence could be part of the negotiation process for setting standards for a particular SVM. [EPA-HQ-OAR-2010-0799-9569-A1, p. 29]

Organization: Wide World Ferrari, Wide World of Cars, LLC

The proposed language would allow a manufacturer to qualify as a small volume manufacturer (SVM) on the basis of its own sales if it can show that it is 'operationally independent' from related manufacturers with which its sales would otherwise be aggregated (see pages 75,991-92 of the proposal). Ferrari of West Palm Beach and Wide World of Cars support EPA’s proposal to allow an operationally-independent manufacturer to be considered a SVM for purposes of the greenhouse gas (GHG) program. The proposed federal regulatory language contains stringent criteria that would ensure strong environmental protections and minimize gaming opportunities, while still allowing flexibility for SVMs like Ferrari that cannot offset emissions of their low volume high performance vehicles with higher volume, lower emission vehicles in the larger fleet. [EPA-HQ-OAR-2010-0799-8142-A2, p. 1]

The proposed language would provide flexibility for small volume manufacturers like Ferrari that are truly independent from other automobile manufacturers in the ownership structure. It also would preserve Ferrari's ability to sell vehicles in the U.S. Our business could suffer if Ferrari does not obtain SVM status and the sale of Ferraris is restricted. A small change in the number of vehicles that Ferrari is able to sell in the U.S. in a given model year could have a substantial impact on our bottom line and number of employees. [EPA-HQ-OAR-2010-0799-8142-A2, p. 2]

EPA's proposal would have very little overall effect on vehicle GHG emissions, because the vehicles sold by SVMs would still have to comply with challenging case-by-case GHG emission standards. The proposed regulatory language also contains stringent criteria and an application process that would make it exceedingly difficult for a manufacturer to alter its existing business in order to take advantage of the flexibility granted to SVMs. [EPA-HQ-OAR-2010-0799-8142-A1, p. 2]

Thus, Ferrari of West Palm Beach and Wide World of Cars urge EPA to finalize the option to demonstrate operational independence. [EPA-HQ-OAR-2010-0799-8142-A2, p. 2]

Response:

EPA received only supportive comments for the proposed case-by-case alternative standards approach for SVMs. In addition, EPA received only supportive comments on allowing manufacturers able to demonstrate operational independence from a parent company to also be eligible for SVM provisions under the GHG program. Responses to comments regarding the SVM alternative standards are provided in section III.B.5.b and comments regarding operational independence are addressed in III.B.5.e.

With regard to Ferrari's suggestion regarding regulatory text pertaining to the applicant's use of any vehicle powertrains or platforms developed or produced by related manufacturers, EPA concurs with the comment and the final regulatory text is consistent with Ferrari's suggestion.

Ferrari recommends that "EPA clarify in the final rule that the auditor performing the attest engagement does not have to be a new auditor hired solely for the purposes of conducting this audit. Rather, EPA should allow a manufacturer to continue to use a CPA or other auditor who has previously performed similar functions for the company, as long as the auditor meets the requirements discussed above. Finally, since a number of the criteria listed in the preamble involve engineering issues, Ferrari suggests that the entity performing the Attest Engagement be allowed to use personnel from outside its organization as necessary to assist in this effort." EPA believes these recommendations are reasonable and has adopted Ferrari's suggestions regarding the attest engagement.

Ferrari commented that EPA should provide at least a three-year transition period to allow the manufacturer to develop the additional testing facilities and time for durability testing, as well as for software, hardware development and installation. EPA is providing 2 full model years after the model year in which a manufacturer's status as operationally independent has changed. In total this will provide the manufacturer with 2 to 3 years to comply with the primary program depending on the timing of the change. EPA believes that this will be sufficient as the parent company and manufacturer would likely have some control over the timing of the change in their status.

10.4. Exemption for Small Businesses

Organizations Included in this Section

AMP Electric Vehicles
Fisker Automotive, Inc.
Vehicle Production Group LLC (VPG)

Organization: AMP Electric Vehicles

The purpose of this letter is to state our support for the provision in the proposed 2017 Light-Duty Vehicle Greenhouse Gas rules that allows small business the opportunity of voluntarily opting-in to the GHG standards. Further, it is our contention that the voluntary opt-in option should be extended to EV converters and alterers. [EPA-HQ-OAR-2010-0799-7984-A1, p. 1]

As you are aware, in the MY 2012-2016 rule regarding greenhouse gas, EPA exempted entities from the emissions standard, "if the entity met the Small Business Administration (SBA) size criteria of a small business as described in 13 CFR 121.201." As we researched this issue, we learned that the intent of the exemption was to assist small OEMs that might not have the resources necessary to address the CO_2 standards in the regulation. An unintended consequence of this small business exclusion is that start up companies, such as AMP, are not be able to accumulate CO_2 credits for converting high emitting internal combustion engine SUVs to emission free EVs. [EPA-HQ-OAR-2010-0799-7984-A1, p. 1]

In the recently published "2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards Rules" an "opt-in" provision allowing small businesses to voluntarily waive their small entity exemption to the GHG standards is proposed. AMP Electric Vehicles unequivocally supports this proposed rule, request that it be made effective immediately and that it be made applicable to converters and alterers. [EPA-HQ-OAR-2010-0799-7984-A1, p. 1]

Passage of the 2017 GHG opt-in provision would allow AMP the ability to accumulate greenhouse gas credits and market them to larger OEMs. Our intent is to exchange these credits with large OEM's in return for distribution assistance through their dealer networks. This would greatly enhance our ability to sell greater volumes of EV's than we would otherwise. In our preliminary discussion with large OEMs in need of credits this concept has received favorable consideration. [EPA-HQ-OAR-2010-0799-7984-A1, p. 1]

Additionally, approval of the opt-in provision would allow AMP the opportunity to generate greater revenue to offset our technology investments and free up capital to invest in additional innovative automotive green technologies. [EPA-HQ-OAR-2010-0799-7984-A1, p. 1]

Further, the provision will afford larger OEM seeking credits a better opportunity to meet their compliance obligations. [EPA-HQ-OAR-2010-0799-7984-A1, p. 2]

Finally, and very importantly, the net result of the passage of 2017 Green House Gas Small Business Opt-In provision is that it would increase the percentage of low and emission free vehicles on America's roads consistent with the intent of this legislation. [EPA-HQ-OAR-2010-0799-7984-A1, p. 2]

AMP recognizes that by choosing to opt-in, our company would be subject to all of the requirements that would otherwise be applicable under this legislation. However, the net effect of its passage would greatly benefit our company and our goal of producing a significant quantity of zero emission vehicles allowing us to contribute to our mutual goal of cleaning up our country's environment. [EPA-HQ-OAR-2010-0799-7984-A1, p. 2]

Organization: Fisker Automotive, Inc.

2) Discuss modifications to the optional compliance provision for small entities

Fisker Automotive is a start-up automobile manufacturer employing fewer than 1,000 people, which qualifies our company as a small entity under Small Business Administration guidelines. The final rule for model years 2012-2016 exempted and excluded small entities from the fleet greenhouse gas standards. Without the ability to opt-in to the rule, we would miss an important opportunity to market the credits generated by this rule to other manufacturers. [EPA-HQ-OAR-2010-0799-9266-A1, p. 2]

Fisker greatly appreciates the proposed optional compliance provision for small entities included in the current proposed rule. We fully agree with the rationale stated in the preamble: [EPA-HQ-OAR-2010-0799-9266-A1, p. 2]

EPA believes that there could be several benefits to this approach, as it would allow small businesses an opportunity to generate revenue to offset their technology investments and encourage commercialization of the innovative technology, and it would benefit any manufacturer seeking those credits to meet their compliance obligations.” [EPA-HQ-OAR-2010-0799-9266-A1, p. 2]

As proposed, the provision would make the opt-in available starting in model year 2014. While this provision would indeed allow Fisker to access the credits it would have generated for model years 2012 and 2013 if it were a large manufacturer, these credits would not be accessible until 90 days after the end of model year 2014, when final compliance for the model year is established. [EPA-HQ-OAR-2010-0799-9266-A1, p. 2]

We view the timing required by this proposal as problematic. Fisker would not be able to complete a transfer on its earned credits until late in calendar year 2014 at the earliest, or nearly three years from today. This would significantly diminish the revenue generating benefit of these credits, particularly during the critical early years of our company when they are most beneficial. [EPA-HQ-OAR-2010-0799-9266-A1, p. 2]

For this reason, we highly encourage EPA to modify the language of this provision such that a small entity would be allowed to fully demonstrate compliance beginning with the 2012 model year. [EPA-HQ-OAR-2010-0799-9266-A1, p. 2]

We believe optional compliance would be feasible beginning with model year 2012 for the following reasons: [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

1) The proposed rule is expected to go into effect by October of this year (60 days after final publication in August). Fisker anticipates its model year 2012 to end around the same time. Final compliance for a given model year is demonstrated with an end-of-year report due 90 days after the end of the model year. There is sufficient time after the rule takes effect for Fisker to demonstrate compliance with its end-of-year report for model year 2012 [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

2) The Fisker Karma sedan is already EPA-certified for model year 2012 under Federal Tier 2 exhaust emission standards, and has been issued a certificate of conformity to this effect [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

3) Fisker Automotive has a strong working relationship with EPA’s compliance division [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

4) Fisker is already subject to the CAFE regulation for model year 2012 [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

5) Since the GHG program “will not impose additional timing or testing requirements on manufacturers beyond that required by the CAFE program,” the only additional work required to comply with the GHG program would be limited to reporting [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

6) Fisker already adheres to the existing practice under Tier 2 to provide EPA with a compliance plan; for the GHG element of this plan, Fisker’s compliance is trivial since our fleet consists only of a vehicle that significantly over-complies with its GHG standard [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

Encourage enforcement of the requirement that manufacturers must make a good faith effort to secure credits from other manufacturers before becoming exempt from standards or becoming eligible for alternative standards As part of establishing eligibility for exemption from the CO_2 standards under the greenhouse gas (GHG) program for MY 2012-2016, Small Volume Manufacturers (SVMs) “must make a good faith effort to secure credits from other manufacturers, if they are reasonably available, to cover the emissions reductions they would have otherwise had to achieve under applicable standards." Fisker Automotive strongly encourages EPA to hold to the spirit of these provisions. As the only entity with complete knowledge of every automaker's credits and deficits, it is incumbent upon EPA to ensure that this provision is fairly enforced. [EPA-HQ-OAR-2010-0799-9266-A1, p. 4]

Organization: Vehicle Production Group LLC (VPG)

Limited Line Manufacturer

Among the first decisions in the development of the business model, was the powertrain selection. The option for VPG to manufacture its own powertrain was determined not to be practical for reasons of cost related to the development of base algorithms for engine controls and on-board diagnostics. Following that determination, a study of powertrains which were offered for sale was undertaken, which ultimately resulted in VPG securing a supply agreement with Ford Motor Company through the Ford Component Sales Division for the supply of powertrains and associated emissions equipment. Ford offered to VPG the V-8, 4.6 liter 16 valve engine, based upon VPG's power requirements, structural architecture, CNG compatibility as well as the production capacity of Ford's engine manufacturing operations. VPG's ability to provide wheelchair users with a superior alternative is dependent upon the production capacity and offerings of the engine manufacturer. [EPA-HQ-OAR-2010-0799-7985-A2, p. 1]

VPG's place in the automotive market is that we are the OEM manufacturer of vehicles which are accessible to wheelchairs. VPG's vehicle design encompasses ADA guidelines for ingress and egress, as well as wheelchair positioning and restraint inside the vehicle. This necessarily puts VPG in the role of a limited line manufacturer. [EPA-HQ-OAR-2010-0799-7985-A2, p. 2]

VPG's fuel economy performance is dependent upon the use of one powertrain. While VPG does have the benefit of offering a fueling option in CNG, the public acceptance of this fueling option is limited and focused, mostly for reasons of infrastructure. The customer base for the CNG option remains the fleet market, where driving patterns are routed near CNG filling stations, although this option offers the potential to raise VPG's CAFE. [EPA-HQ-OAR-2010-0799-7985-A2, p. 2]

As EPA advises in the NPRM, there are high risks for limited line manufacturers in implementing new technologies. In VPG's case, access to the technologies are limited or out of reach for reasons of market offerings, lead time, or feasibility. For example, EPA counts among other technologies, turbocharging as a technology which can be implemented after production decisions have been undertaken. However, such technologies are available to VPG only if the powertrain supplier offers the technology for sale to VPG. The alternative of VPG implementing a technology like turbocharging under the assumption it were added to the engines as a retrofit is not feasible. From the standpoint of development of controls and diagnostics algorithms, a limited line manufacturer such as VPG would not have the financial resources or expertise to implement these technologies with the requisite reliability, durability and timing. [EPA-HQ-OAR-2010-0799-7985-A2, p. 2]

We point out that the limited line nature of manufacturers has been used in the regulatory environment to differentiate the impact of regulations on smaller entities. Therefore, VPG requests institution of exemption from the greenhouse gas regulations based on the limited line manufacturer status. VPG suggests a review of the appropriate vehicle line threshold, with 3 lines or less being a reasonable place to visit this subject. [EPA-HQ-OAR-2010-0799-7985-A2, p. 2]

VPG notes that on page 75161 of this NPRM, potentially affected small entities are discussed in terms of three models: 1) small volume manufacturers (SVMs), 2) independent commercial importers, (ICIs), and 3) alternative fuel vehicle converters. We believe that the limited line manufacturer should be added to this list of types of small entities affected, and that allowances should be made for manufacturers in this list. [EPA-HQ-OAR-2010-0799-7985-A2, p. 2]

VPG requests exemption from this GHG regulation for small entities, limited line manufacturers. [EPA-HQ-OAR-2010-0799-7985-A2, p. 4]

Response:

EPA is finalizing its proposal to exempt small businesses from the MY 2017-2025 standards. EPA is also finalizing its proposal to allow small businesses manufacturers to waive their small entity exemption and opt-in to the primary GHG standards. Commenters generally supported both the exemption and the opt-in provisions. The opt-in will allow small business manufacturers to earn CO_2 credits under the program. The small business would have to meet the primary standard for its fleet (that is, the small business would be allowed to opt-in to the primary program standard, but not to the small volume manufacturer standards. Fisker's comments regarding the timing of the opt-in and credit generation are discussed in section III.B.7 of the preamble. VPGs comments regarding limited line manufacturers are also addressed in III.B.7.

In response to AMP's comments that small business alternative fuel converters should be allowed to generate credits, EPA does not view this as a small business issue but as an issue with the way alternative fuel conversions are addressed under EPA's fleet average standards. Alternative fuel converters are not required to meet fleet average standards but instead must comply with anti-tampering regulations by demonstrating that the conversion does not increase emissions. Fleet average standards are not generally appropriate for fuel conversion manufacturers because the ''fleet'' of vehicles to which a conversion system may be applied has already been accounted for under the OEM's fleet average standard. Alternative fuel converters are not manufacturing new vehicles, but are converting existing vehicles that have already been certified by the OEM. Converters must qualify for a tampering exemption under 40 CFR subpart F and fleet average standards do not apply. CO_2 credits are available to OEMs based on fleet emissions performance compared to the fleet average standards and therefore conversions are not eligible for these credits. A small business alternative fuel convertor may opt into the GHG program and thus be required to make a showing that they are in compliance with requirements of 40 CFR subpart F, but these vehicles would not be subject to the fleet average standards and therefore would remain ineligible for credits.

10.5. Exemption for Emergency and Police Vehicles

Organizations Included in this Section

Alliance of Automobile Manufacturers
Ford Motor Company
General Motors Company
Pennsylvania Department of Environmental Protection
Vehicle Production Group LLC (VPG)

Organization: Alliance of Automobile Manufacturers

Police and Emergency Vehicles [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

The Alliance agrees with EPA's proposal for the option to exclude police and emergency vehicles from fleet-average CO_2 standards.10 However, in order to harmonize with the CAFE regulations and fully exclude any influence that emergency vehicles may have on fleet average CO_2, EPA must exempt emergency vehicles from the methane (CH_4) and N_2O standards as well. [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

Per the current regulations, if any vehicle were to exceed the CH_4 and/or N_2O standards, a manufacturer would be required to either include the CH_4 and N_2O emission values for all vehicles in its fleet average calculation or account for the exceedance(s) using CO_2 credits. Therefore, if a police or emergency vehicle were to be the only vehicle to exceed either of these standards, the manufacturer would be incurring an increase in fleet-average CO_2 or a decrease in CO_2 credits solely due to the influence of the emergency vehicle. [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

The Alliance recommends that the following paragraph be added to 40 C.F.R. §86.1818-12(f): [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

Emergency vehicles. Emergency vehicles that have been excluded from fleet average CO_2 exhaust emission standards under paragraph (c)(4) of this section are exempt from the N_2O and CH_4 standards of this paragraph (f). [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

Organization: Ford Motor Company

Emergency Vehicles

EPA has proposed to exclude emergency vehicles, from the greenhouse gas requirement effective with the 2012 model year, consistent with the exclusion of emergency vehicles from CAFE standards. In our comments on the 2012-2016 rules, Ford urged EPA to exclude emergency vehicles from the GHG regulations; we stand by those comments and incorporate them herein by reference. Those comments are fully consistent with EPA's determination that the exclusion of these vehicles is appropriate,

"…because of the unique features of vehicles designed specifically for law enforcement and emergency purposes, which have the effect of raising their GHG emissions and calling into question the ability of manufacturers to sufficiently reduce the emissions from these vehicles without compromising necessary vehicle features or dropping vehicles from their fleets. (76 Fed. Reg. 74880) [EPA-HQ-OAR-2010-0799-9463-A1, p. 25]

Section 202(a) of the CAA allows EPA to prescribe standards 'applicable to the emission of any air pollutant from any class or classes of new motor vehicles…' The language 'class or classes' indicates that EPA may apply its standards to particular types or categories of vehicles, and likewise make exclude particular types or categories of vehicles when there is reason to do so. This language gives EPA the authority to incorporate regulatory provisions excluding emergency vehicles from the fleet average requirement. The exclusion of emergency vehicles makes sense as a matter of policy, and it also promotes the goals of One National Program by harmonizing the GHG and CAFE rules on this point. [EPA-HQ-OAR-2010-0799-9463-A1, p. 25]

Organization: General Motors Company

GM supports EPA's efforts to further harmonize with the NHTSA program with regard to the exclusion of emergency and police vehicles, and joins with the Alliance in suggesting modifications to section 40 C.F.R. §86.1818-12(f). [EPA-HQ-OAR-2010-0799-9465-A1, p. 4]

Organization: Pennsylvania Department of Environmental Protection

The Agencies Should Ensure that the Fleet Averages Reflect Real-World Conditions.

The agencies should, at minimum, include police and emergency vehicles in calculations of GHG fleet average standards. The EPA-led advisory committee presents a good case for new technologies to generate more horsepower. This extra horsepower can be used to downsize a vehicle's engine. No logical reason seems to exist as to why this new technology cannot be used for police and emergency vehicles in order to gain fuel efficiency without loss of power. Police and emergency vehicles constitute a large fleet in the United States; not including them so they can benefit from the same GHG-reducing technology would be unfortunate. If manufacturers are not being tasked to develop more fuel-efficient police and emergency vehicles, then at the very least, emissions of emergency vehicles should be included in the overall targeted standards. Including emissions produced by emergency vehicles would lower the overall emission standard of the proposed rulemaking, but would make for a more accurate accounting of the impact of the program. [EPA-HQ-OAR-2010-0799-7821-A1, p. 4]

Organization: Vehicle Production Group LLC (VPG)

Vehicles Used for the Public Good

EPA advises in III.B.9. that police and emergency response vehicles will be exempted from the regulation. This is in following with past regulations and U.S. code which have exempted vehicles manufactured "for the public good". While that exact stipulation is generally phased out, the spirit and intent is still a part of the regulatory backdrop. VPG suggests that a vehicle manufactured for the specific purpose of transporting wheelchair users is indeed for the public good; and in fact VPG's vehicle is a unique and robust solution to the needs of the disabled community as well as several legal actions relating to wheelchair accessibility of federally funded transportation services – most notably in New York City. It is VPG's proposal to extend this exemption beyond police and ambulance vehicles to vehicles whose intended use is for the public good. [EPA-HQ-OAR-2010-0799-7985-A2, p. 2]

VPG also proposed that vehicles used for the public good not be subject to this regulation. [EPA-HQ-OAR-2010-0799-7985-A2, p. 4]

Response:

EPA is finalizing its proposal to exempt police and other emergency vehicles from the GHG standards starting in MY2012. Emergency vehicles are also exempt from the N_2O and CH_4 standards. Thus emergency vehicles are not included in the National Program at this time. Comments, including those from Pennsylvania DEP and the Vehicle Production Group, are addressed in preamble section III.B.8.

11. Gasoline Fuel Quality

11.1. Need for Octane

Some commenters have advocated for a required increase in gasoline octane levels to improve vehicle efficiency and reduce greenhouse gas emissions, particularly if it would enable future vehicles to be designed with higher compression ratios.

Organizations contained in this section
Alliance of Automobile Manufacturers
American Fuel and Petrochemical Manufacturers (AFPM)
Boyden Gray & Associates PLLC
Clean Fuels Development Coalition (CFDC)
Ford Motor Company
Growth Energy
ICM Inc.
Pennsylvania Department of Environmental Protection
Renewable Fuels Association (RFA)
Volvo Car Corporation

Comments:

Organization: Boyden Gray & Associates PLLC

Why the industry's interest in octane? The proposed rule preamble devotes considerable discussion to technology improvements for spark ignition engines, but the agencies do not explain in any detail why they have requested comment on whether higher octane fuels are needed to comply with increasingly stringent fuel economy standards. [EPA-HQ-OAR-2010-0799-9506-A1, p. 6]

Organization: Boyden Gray & Associates PLLC

The issue of octane is worth much more than the few words provided by the agencies out of hundreds of pages of proposed rule. Octane has a major impact on both the efficiency gains the car companies can provide as well as the traditional pollution benefits that the agencies can achieve. These improvements, in turn, have a significant impact on the cost-benefit ratios the agencies must consider. [EPA-HQ-OAR-2010-0799-9506-A1, p. 6]

Organization: Pennsylvania Department of Environmental Protection

The agencies should re-evaluate the rulemaking, the Draft Joint Technical Support Document (TSD) and the Regulatory Impact Analysis (RIA) in order to assess the future consumer demand for higher octane gasoline that will be needed to adequately power technologies that EPA believes will be used to meet the GHG emission standards. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Organization: Pennsylvania Department of Environmental Protection

EPA predicts that the burden of meeting these standards will fall on gasoline vehicles since diesel vehicles will not penetrate the light-duty fleet significantly and all alternative-fueled vehicles will amount to no more than 10 percent of the fleet. EPA believes automobile manufacturers will rely heavily on new engine designs that use eight-speed, high-compression, turbocharged engines, but typically manufacturers recommend that engines of this type be refueled with higher octane gasoline (91- to 93-octane) to avoid potentially damaging engine knocking. EPA indicated that using the combination of turbocharging and other technology improvements will eliminate the need to use high octane gas and will allow the consumer to use 87-octane gasoline. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Organization: Pennsylvania Department of Environmental Protection

In addition to examining the air quality effects of the factors above [see section 18.2 of this comment summary], the increase in volatile organic compounds (VOC) emissions needs to be estimated due to the possible increase in Reid vapor pressure in gasoline from the increased use of higher octane gasoline. Higher emissions of VOC can lead to increased ground-level ozone concentrations. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

AFPM supports the Administration’s decision not to include gasoline octane rating in this rulemaking. [EPA-HQ-OAR-2010-0799-9485-A1, p.9]

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

Automakers have recommended increasing the minimum gasoline octane rating to help meet future GHG emissions requirements (see Oct. 6, 2011 letter from the Alliance of Automobile Manufacturers to Lisa Jackson). The cost implications of such a change are enormous and would have serious impacts on U.S. refinery operations. Evidently, the Administration shares our belief that an increase in gasoline octane is not necessary and is unsubstantiated. [EPA-HQ-OAR-2010-0799-9485-A1, p.9]

Organization: Alliance of Automobile Manufacturers

These improvements will better support several technologies and allow introduction of some options, like stratified lean burn engines, which otherwise might not be available for U.S. consumers. Reduced sulfur will also optimize emission control systems and reduce emissions in existing vehicles. Higher octane grades in market fuels would enable optimization of combustion/thermal efficiency, for example in certain high compression or turbocharged engines. Other fuel-related characteristics to assure timely compatibility with advanced technology vehicles may also need to be addressed during the period covered by this rulemaking. [EPA-HQ-OAR-2010-0799-9487-A1, p.85]

Organization: Ford Motor Company

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 44-47.]
Also, market fuel quality, particularly octane level, can have a significant positive impact on all on-road vehicles and should, therefore, be a key part of our national strategy to improve energy security.

Organization: Volvo Car Corporation (VCC)

Higher octane fuel would enable manufacturers to pursue strategies that better support development and introduction of advance vehicle technologies, and a consequent reduction in greenhouse gases and criteria emissions. To optimize engine fuel efficiency and minimize emissions, transitioning to higher octane regular and premium grade market gasoline may be necessary. VCC would support establishment of a minimum blend stock octane. In this way, adding ethanol would raise fuel octane without risk that blenders would make corresponding reductions in base blend stock octane, thereby undoing the octane benefit of ethanol addition. We recommend that EPA assess the environmental benefits of higher octane gasoline. [EPA-HQ-OAR-2010-0799-9551-A2, p.15]

Organization: Clean Fuels Development Coalition (CFDC)

THE CRITICAL IMPORTANCE OF OCTANE. For SI gasoline-powered engines, octane is an extremely important fuel property to help the OEMs achieve both efficiency improvement and pollution reduction. NHTSA requested comment on whether higher octane fuels “may be necessary if certain advanced fuel economy-improving technologies are required by stringent CAFE standards” (p. 75335). [EPA-HQ-OAR-2010-0799-9574-A3, p. 3]

Organization: Clean Fuels Development Coalition (CFDC)

In a recent letter to EPA Administrator Jackson, the Alliance of Automobile Manufacturers has suggested increasing gasoline octane levels: “…[T]o help achieve future requirements for the reduction of greenhouse gas emissions, we also recommend increasing the minimum market gasoline octane rating, commensurate with increased use of ethanol.” [See Attachment A in Docket number EPA-HQ-OAR-2010-0799-9574-A4] The Auto Alliance also has recently stressed how important it is for regulators to recognize the differences between the various octane sources and the importance of ensuring fuel quality, in addition to controlling vehicle hardware and calibration effects. In comments submitted in September 2010 to California EPA on its LEV III certification fuel hearing, the Alliance noted that, “[a] Total Aromatics limit alone in the cert fuel spec does not preclude the blending of relatively high molecular weight aromatics that can lead to increased HC and PM emissions.” [See Attachment C in Docket number EPA-HQ-OAR-2010-0799-9574-A6] [EPA-HQ-OAR-2010-0799-9574-A3, p. 3]

Organization: Clean Fuels Development Coalition (CFDC)

While EPA did not specifically request comment on the matter of octane, it is our understanding that EPA assumes that the standard for SI engine fuel will be 87 octane (R + M/2), and that engine compression will be capped at 10.5:1. We believe this assumption unnecessarily inhibits fuel quality and engine design improvements that could be made available by both fuel providers and the OEMs, and that it could adversely impact the nation‘s petroleum dependence, carbon footprint, and health and welfare goals. Today, Aromatic Group Compounds constitute approximately 25% of an average gallon of U.S. gasoline, which refiners synthesize from crude oil to increase octane ratings. They are the most toxic, energy inefficient, carbon-intensive, and costly components in gasoline, and we believe that the goals of this rulemaking cannot be fully and efficiently met unless they are steadily reduced over time. As will be discussed further below, it is entirely realistic to reduce Aromatic Group Compounds in the U.S. gasoline pool while simultaneously increasing average octane levels over the life of this rulemaking. [EPA-HQ-OAR-2010-0799-9574-A3, p. 4]

Organization: Renewable Fuels Association (RFA)

EPA/NHTSA should consider what fuel properties and characteristics, such as minimum octane levels, will be necessary to achieve the proposed CAFE/GHG standards. EPA should be mindful of these properties and characteristics as it considers both the final CAFE/GHG standards and the elements of the upcoming Tier 3 rulemaking. [EPA-HQ-OAR-2010-0799-9490-A1, p.2 and 7]

Organization: Renewable Fuels Association (RFA)

Similarly, in a letter dated October 6, 2011, to EPA Administrator Jackson, the Alliance of Automobile Manufacturers stated, "…to help achieve future requirements for the reduction of greenhouse gas emissions, we also recommend increasing the minimum market gasoline octane rating, commensurate with increased use of ethanol. Adding ethanol to gasoline increases its octane rating" (Attachment B). We agree that EPA should consider including an increased minimum octane rating when contemplating changes to the certification test fuel. We fully understand that changes to fuel requirements will be primarily undertaken as part of the Tier 3 rulemaking, and not as part of the CAFE/GHG rule. However, as stated earlier, we believe the two rules are tightly connected, and as such, the fuel properties and characteristics needed to achieve the 2017-2025 CAFE/GHG requirements must be closely examined as both rulemakings are advanced. [EPA-HQ-OAR-2010-0799-9490-A1, pp.7-8] [For attachment B please refer to EPA-HQ-OAR-2010-0799-9490-A1, pp.55-57]

Organization: Pennsylvania Department of Environmental Protection

However, at this point, no mechanical approach seems to have solved the problem of engine knock in a high compression turbocharged engine, and manufacturers are still advising owners to use the higher octane fuel. Consumers will most likely follow a manufacturer's recommendation or risk a forced reduction in performance, increased maintenance costs, or engine damage. We believe that a greater volume of higher octane gasoline will be required to mix with regular high compression engines to achieve the GHG standards. This will mean that either higher volumes of ethanol, an oxygenate, will need to be added by gasoline distributors to boost octane levels or the refiner will need to supply higher octane base stock gasoline. A higher octane base stock may require additional chemical additives like alkylates to be produced and used at the refinery. The agencies have not adequately addressed these problems in any of the documentation in the public docket for this rulemaking. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Organization: Pennsylvania Department of Environmental Protection

The Agencies Should Evaluate Fuel Costs, Availability, and Impacts of Higher Octane Gasoline.

The agencies should re-evaluate the costs in the proposed rulemaking's RIA to account for the increased cost to the consumer to purchase higher octane gasoline. The agencies should also examine the likely future availability of ethanol or alkylates needed to meet the standards in the proposed rulemaking and the potential for adverse environmental consequences due to increased production of higher octane gasoline. The agencies need to examine the ability of refiners to supply, and the ability of fuel distribution system to transport, higher octane gasoline. We ask that the agencies expand the consideration of costs and air quality impacts. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Costs and Life-Cycle Costs. The extra cost for higher octane gasoline should be used to estimate the costs for this rulemaking. It appears that EPA used the cost of regular gasoline in their RIA (p. 3-15) for this rulemaking. Also, the increased performance that EPA is expecting to achieve from turbocharging and other technologies seems to be based on the vehicle using higher octane fuel. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

All potential costs and environmental impacts must be considered such as supply chain burdens, transportation availability, market transition costs, capital investments for higher octane gasoline and/or for production of additional ethanol or alkylates and the possibility of shortages in some areas of the country. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Nevertheless, we are concerned that much of the nation’s gasoline supply will require higher octane levels to meet these GHG standards and that EPA has not considered the implications. EPA either needs to address (in the face of manufacturers’ current recommendations) why more mid-grade gasoline will not be needed to run turbocharged, high-compression engines or the implications of greater use of higher octane gasoline should be fully evaluated. [EPA-HQ-OAR-2010-0799-7821-A1, p. 5]

Organization: ICM Inc.

Octane. Health and Environmental Impacts. [EPA-HQ-OAR-2010-0799-9541-A2, p.2]
The question was posed in the NPRM as to what other health and environmental impacts associated with advancements in vehicle GHG reduction technologies should be considered. To the extent that those GHG reduction strategies involve smaller but higher compression engines that require higher octane fuels, the impacts could be considerable. [EPA-HQ-OAR-2010-0799-9541-A2, p.2]

Organization: ICM Inc.

Octane. Health and Environmental Impacts. [EPA-HQ-OAR-2010-0799-9541-A2, p.2]

In addition to our work in developing food and fuel technologies, ICM has been directly engaged in cooperative research with the auto industry, and we have focused much of our effort on maximizing the octane value of ethanol. In our ongoing work and discussions with automakers, it has become clear there are only a few avenues available to them that would enable them to meet the aggressive fuel economy and carbon reduction requirements of this Rule. Foremost among them is the likelihood of downsized engines that would have higher compression and require higher octane. These smaller engines operating on premium grade fuels can achieve significantly greater efficiency. [EPA-HQ-OAR-2010-0799-9541-A2, p.2]

Organization: Growth Energy

As explained in Attachment 3 [pp. 22-41 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] to this letter, there are strong policy reasons for EPA to establish regulations for a new gasoline certification fuel at 94 octane (AKI), and to provide for the general commercial availability of such a fuel for vehicles produced in or after MY 2017, in the same manner that "regular" gasoline at a lower octane level is now currently sold. [EPA-HQ-OAR-2010-0799-9505-A1, p. 5]

Organization: Growth Energy

Growth Energy recommends enforceable requirements for the gasoline marketing industry in the U.S. that will ensure the commercial availability of gasolines that have an octane value of 94, for use in optimizing the GHG performance of new vehicles certified to the proposed GHG emission standards. [EPA-HQ-OAR-2010-0799-9505-A1, p. 22]

Organization: Boyden Gray & Associates PLLC

In sum, 87-octane fuel is a potentially significant limitation on technology improvement. Moreover, clean higher-octane components are lower in CO_2 than the current principal source of octane in gasoline, as well as lower in traditional pollutants. It is clear that toxic-free premium fuel is in fact necessitated by the rule, since the rule relies on advanced technologies that can only function on higher-octane fuel, and this fuel must be clean burning in order to avoid PM increases. [EPA-HQ-OAR-2010-0799-9506-A1, p. 7]

Organization: Alliance of Automobile Manufacturers

Two key fuel properties of concern to Alliance members for market fuel gasoline and gasoline blends are: (1) the need for continued reductions to minimize sulfur content, and (2) the need to transition to higher octane grades (most likely commensurate with higher ethanol or other bio-based fuel blend content), and related issues about renewable fuel and base gasoline contributions. [EPA-HQ-OAR-2010-0799-9487-A1, p.84]

Organization: Boyden Gray & Associates PLLC

Another provision of the 1990 CAAA—the mobile source air toxics (MSAT) provision—requires EPA to reduce toxics as far as technology will permit. EPA has not enforced this section except to reduce benzene by modest amounts in 2007, notwithstanding the fact that the U.S. is drowning in non-toxic alternatives to gasoline and diesel (i.e., all of the non-petroleum alternatives like alcohols, natural gas, electricity, etc.). There were indications that EPA intended to address the issue of aromatics and octane in the Tier III rulemaking, but this may apparently longer be the case—hence the letter from the auto companies to EPA referred to above. But if EPA is not going to address octane in Tier III, it must do so now in order to allow the car companies more flexibility. [EPA-HQ-OAR-2010-0799-9506-A1, p. 7]

Organization: Boyden Gray & Associates PLLC

Alternative fuels all have two important characteristics in common. They are all essentially free of air toxics, which are the principal source of unhealthy particulate matter (PM). Both air toxics and PM are dangerous pollutants that are regulated under the CAA. Alternative fuels also have significantly higher octane ratings, which would enable higher compression. This, as the Ricardo study notes, allows for "increased thermodynamic efficiency" when used in connection with some direct injection technologies."18 Yet the review does not appear to include a simple stand-alone compression increase as a proposed advance. The proposed rules provide no explanation for this omission. The Ricardo study indicates that the analysis is based throughout on a 10.5:1 compression ratio,19 and further that the octane of the fuel used for evaluating all new technology is 87.20 If the octane available to the auto manufacturers is capped at 87, then they cannot seek efficiency gains from compression higher than the ratio identified above. Moreover, they may not be able to take advantage of other technologies such as direct fuel injection without increasing tailpipe pollution.21 Finally, they will not be able to take advantage of high-octane fuels such as alcohols and natural gas, which produce lower levels of both traditional pollutants and CO_2 than gasoline and diesel. [EPA-HQ-OAR-2010-0799-9506-A1, pp. 6-7]

Response:

As evidenced by the analysis supporting this final action, we believe that the LD GHG standards being finalized today are entirely feasible and cost effective without the need for increasing the octane of gasoline. . Nor do we agree that higher octane fuel will be necessary for turbocharged and downsized engines to prevent the onset of combustion knock. EPA assumed no change in the octane of certification or in-use gasoline within its analysis and the effectiveness values used for the high BMEP engines reflect that fact. The current Ford EcoBoost turbocharged GDI engines do not require the use of premium fuel, although those engines are not operating at BMEP levels as high as those expected under our rule. Importantly, a combination of both intake charge dilution (e.g., cooled EGR) and in-cylinder evaporative fuel cooling (e.g., direct injection) are expected to allow higher BMEP GDI engines to operate on regular grade gasoline. All packages at 27 bar BMEP analyzed by EPA included cooled EGR to allow higher BMEP operation and prevent the onset of combustion knock on current certification or in-use fuels. See Joint TSD p. 3-88 ("Use of GDI systems with turbocharged engines and air-to-air charge air cooling also reduces the fuel octane requirements for knock limited combustion and allows the use of higher compression ratios.") See also Joint TSD at p. 3-91 ("Use of GDI systems with turbocharged engines and air-to-air charge air cooling also reduces the fuel octane requirements for knock limited combustion and allows the use of higher compression ratios. Ford's "Ecoboost" downsized, turbocharged GDI engines introduced on MY 2010 vehicles allow the replacement of V8 engines with V6 engines with improved in 0-60 mph acceleration and with fuel economy improvements of up to 12 percent.")

Consequently, we do not believe any regulatory action is warranted at this time to increase the octane level of all gasoline. Furthermore, any benefits of higher octane gasoline are already possible. Were manufacturers to design their vehicles to take advantage of higher octane fuel, such fuel - premium gasoline - is already available nationwide for those consumers who purchase such vehicles, and production of higher octane gasoline could easily rise to respond to market demand. There is not a compelling need to require consumers whose vehicles will not benefit appreciably from higher octane gasoline to pay for it.

11.2. Aromatics

The commenters highlight a number of potential health concerns with respect to the aromatic content of gasoline.

Organizations contained in this section
American Council on Renewable Energy (ACORE) and Biomass Coordinating Council (BCC)
Boyden Gray & Associates PLLC
Clean Fuels Development Coalition (CFDC)
Governors' Biofuels Coalition
Growth Energy
ICM Inc.

Comments:

Organization: Clean Fuels Development Coalition (CFDC)

It is especially important to note that, in order to provide an accurate picture of the final rule‘s health and welfare impacts, the Agencies cannot evaluate emissions results based only on certification fuels and laboratory testing procedures such as the FTP and US06 methods. When real-world fuels containing on average 25% Aromatic Group Compounds are combusted under real-world driving conditions (e.g., stop-start, acceleration and high speeds, heavy loads, etc.), tailpipe emissions of harmful ambient particulate matter increase significantly, as the Aromatic Group Compounds‘ extraordinary resistance to complete combustion ultimately stymies the best efforts of the vehicles‘ catalytic converter. Even more worrisome is the fact that some of the more important new advanced engine technologies (e.g., gasoline direct injection) will make these emissions even worse if fuel quality is not improved. [EPA-HQ-OAR-2010-0799-9574-A3, p. 2]

Organization: American Council on Renewable Energy (ACORE) and Biomass Coordinating Council (BCC)

3. Reducing the level of aromatics (BTX) in gasoline to limit emissions of highly health-damaging particulate matter, especially ultrafine particulates. [EPA-HQ-OAR-2010-0799-9593-A2, p. 5]

Organization: American Council on Renewable Energy (ACORE) and Biomass Coordinating Council (BCC)

The continued use of BTX as octane enhancers represents a serious health threat according to existing data. BTX group compounds that do not completely combust remain in the air and form fine (known as $PM_{2.5}$, or particulate matter smaller than 2.5 microns in diameter) and ultrafine particulate matter (UFP). There is extensive evidence linking $PM_{2.5}$ and UFP to numerous diseases and conditions, including [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]

- Respiratory diseases such as asthma [EPA-HQ-OAR-2010-0799-9593-A2, p. 2]
- Cardiovascular illness and heart diseases [EPA-HQ-OAR-2010-0799-9593-A2, p. 3]
- A wide range of cancers [EPA-HQ-OAR-2010-0799-9593-A2, p. 3]
- Infant mortality and premature birth [EPA-HQ-OAR-2010-0799-9593-A2, p. 3]

Organization: ICM Inc.

Octane. Health and Environmental Impacts. [EPA-HQ-OAR-2010-0799-9541-A2, p.2]
Given the documented position of automakers as to their need for increased octane, it would be completely consistent to the Rule if a cap on aromatics was imposed, recognizing a failure to do so could, in fact, lead to significant increase in overall aromatic content and corresponding adverse health impacts as previously described. [EPA-HQ-OAR-2010-0799-9541-A2, p.4]

Organization: ICM Inc.

Octane. Health and Environmental Impacts. [EPA-HQ-OAR-2010-0799-9541-A2, p.2]
Replacing petroleum derived aromatics with 'clean octane,' i.e., ethanol, achieves both a petroleum reduction and the energy, economic, and health benefits that result from such a reduction, as well as a carbon reduction for the purposes of greenhouse gas mitigation and climate change. The cost of ethanol, as compared to current aromatic compounds used in gasoline, would favor consumers. As of late January, toluene, the most popular aromatic compound sold for octane purposes, was selling for $3.20 per gallon (Gulf Coast) while ethanol-with a higher blending octane value--was selling for $ 2.32 (Gulf Coast). This is a historical spread that has remained constant over several years (Fig 1). [EPA-HQ-OAR-2010-0799-9541-A2, p.3] [For the associated figure please refer to EPA-HQ-OAR-2010-0799-9541-A2, p.3]

Organization: ICM Inc.

Octane. Health and Environmental Impacts. [EPA-HQ-OAR-2010-0799-9541-A2, p.2]
EPA needs to consider the source of that octane, given the increasing body of evidence suggesting the relationship between octane, aromatics and particulates. The Agency has long documented the relationship of air toxics and particulate matter to various respiratory ailments and other health risks. As EPA is well aware from its modeling in the MSAT Rule, ethanol is an

excellent source of octane and, of course, has considerably lower carbon content than gasoline, even with full lifecycle penalties applied. Conversely, aromatic compounds, such as benzene, toluene, and xylene, are classified as air toxics, and benzene is a known carcinogen. It would appear to be in the public's best interest in terms of health and the environment to do everything possible to limit the aromatic content in gasoline so that the public is not subjected to these harmful compounds. Strictly from a carbon reduction standpoint, aromatic compounds can be 20% more carbon intensive than gasoline itself. Ethanol can reduce base gasoline by 20%. When used to replace an aromatic compound, it would result in a potential total 40% carbon reduction. [EPA-HQ-OAR-2010-0799-9541-A2, pp.2-3]

Organization: ICM Inc.

Octane. Health and Environmental Impacts. [EPA-HQ-OAR-2010-0799-9541-A2, p.2]
We believe the critical health impacts need to be considered as a result of higher octane fuels center around the under-regulated subset ofpm1iculates which are ultra-fine particulates (UFPs). They are produced as a result of the fuel combustion process and are not controlled via current vehicle technology, nor are they likely to be. Long thought to be a diesel or stationary source problem, increasing data suggests PM does have a relationship to gasoline, specifically UFPs, which are considerably smaller than the regulatory benchmark of$PM_{2.5}$. They may actually be produced in the combustion process as a result of the higher aromatic content in gasoline, according to recent research by Honda.1 These UFPs are suspected of being a much more significant health threat as they can essentially bypass the lungs as a filter system and enter the bloodstream. [EPA-HQ-OAR-2010-0799-9541-A2, p.3]

Organization: ICM Inc.

1) The likelihood of increased octane needs of the auto industry resulting in higher aromatics; [EPA-HQ-OAR-2010-0799-9541-A2, p.1]

Organization: ICM Inc.

2) The negative health and environmental impacts of increasing octane from aromatics, the relationship of air toxics and aromatics to particulate formation, and the growing body of evidence showing aromatics to be precursors to ultra-fine particulates; [EPA-HQ-OAR-2010-0799-9541-A2, p.1]

Organization: Growth Energy

Attachment 3 also explains why examination of the potential increases in emissions that EPA has regulated for many years (more specifically, fine particulate matter) in the current rulemaking is important even if EPA decides that it cannot take regulatory action under section 211 as the statute currently exists. The Agencies' cost-benefit analysis of the standards in the Joint NPRM assumes reductions in fine particulate matter. If, as explained in Attachment 3 [pp. 22-41 of Docket number EPA-HQ-OAR-2010-0799-9505-A1], those standards would have the unintended effect of increasing engine PM emissions, then the cost-benefit analysis mandated by governing Executive Orders must be revised. [EPA-HQ-OAR-2010-0799-9505-A1, p. 6]

Organization: Growth Energy

Among the fuel-related mitigation methods, further regulation of the composition of gasoline should be considered since there is evidence that the heavier components of gasoline, i.e., the aromatics, contribute substantially to PM emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 40]

Organization: Governors' Biofuels Coalition

Petroleum refiners produce aromatics, also known as the BTX (benzene, toluene, xylene) Group, from crude oil. The BTX Group is the most toxic, energy inefficient, and expensive gasoline component. As crude oil costs escalate, BTX Group costs increase the price of gasoline disproportionately and affect the nation's economic growth. Lower cost, clean octane alternatives to the BTX Group include the use of intermediate ethanol blends and a greater reliance on natural gas vehicles and electric vehicles. [EPA-HQ-OAR-2010-0799-9570-A1, p. 2]

Organization: Governors' Biofuels Coalition

A final rule that fails to improve U.S. transportation fuel standards by reducing BTX Group compounds is the wrong policy for America. On behalf of the Coalition, I respectfully urge you to modify the proposed rule so as to provide market-based incentives and encourage the cost effective substitution of domestic clean octane alternatives for toxic BTX Group compounds derived largely from imported crude oil. [EPA-HQ-OAR-2010-0799-9570-A1, pp. 2-3]

Organization: Governors' Biofuels Coalition

The Wall Street Journal reported on November 8, 2011 that emerging science points to an alarming but largely hidden trend: 'As roadways choke on traffic, researchers suspect that the tailpipe exhaust from cars and trucks - especially tiny carbon particles already implicated in heart disease, cancer and respiratory ailments - may also injure brain cells and synapses key to learning.' The article specifically noted the threat to expectant mothers who live near high-traffic areas, whose babies' DNA may be significantly harmed by 'prenatal exposure to high levels of polycyclic aromatic hydrocarbons in exhaust.' [EPA-HQ-OAR-2010-0799-9570-A1, p. 2]

Organization: Governors' Biofuels Coalition

The Health Effects Institute has also warned that '[u]ltrafine particles' ...small size and high surface area might make [them] especially toxic when inhaled. Many researchers have pointed to gasoline octane enhancers - known as aromatics - as the primary source of the urban ultrafine particles emissions and the toxic derivatives that coat them. Concern has heightened recently, given evidence that emissions of ultrafine particles might increase with greater use of gasoline direct-injection engines and other changes in fuels and technology.' For these reasons, European regulators have already announced their intention to regulate not only diesel, but also spark ignition and particle number emissions, which recent studies have shown are directly linked to aromatics. [EPA-HQ-OAR-2010-0799-9570-A1, p. 2]

Organization: Clean Fuels Development Coalition (CFDC)

In its 2007 MSAT Final Rule, EPA observed that "[t]here may be compelling reasons to consider aromatics control in the future, especially regarding reduction in secondary $PM_{2.5}$ emissions, to the extent that evidence supports a role for aromatics in secondary $PM_{2.5}$ emissions."20 In a 2010 study, EPA Office of Research and Development experts confirmed that anthropogenic pollution, especially mobile source primary carbonaceous particulate matter and NO_x emissions, "facilitate transformation of naturally emitted VOCs to the particle phase." EPA's modeling predicted that reducing mobile source emissions could help to reduce biogenic SOA emissions in the eastern U.S. by as much as 50% or more.21 This rulemaking provides EPA an opportunity to recognize the significant role played by gasoline exhaust, not just diesel exhaust, and the dominant role that Aromatic Group Compounds play in gasoline emissions. A May 2010 UCLA study noted that "several polycyclic aromatic hydrocarbons (PAHs) are toxic to living organisms, and engine exhaust emissions constitute a major source in urban areas…We focus this report on our estimates of vapor-phase naphthalene (NAP) from gasoline and diesel engines emissions…taking into consideration that SI engines constitute 96% of the estimated 28 million California vehicle fleet, and that the NAP content in regular and premium gasoline ranges from 69 up to 2,600 ppm since 1999, reduction of NAP from SI fuels may constitute an effective means of reducing the emissions of a major SOA-forming precursor to the atmosphere of large urban centers."22 [EPA-HQ-OAR-2010-0799-9574-A3, pp. 5-6]

Organization: Clean Fuels Development Coalition (CFDC)

P. 75104, ULTRAFINE PARTICLES' PM AND AIR TOXIC HEALTH EFFECTS. We believe it is critically important for the Agencies to recognize the direct connection between the UFP fraction of $PM_{2.5}$ and the deadly toxics that coat them: the polycyclic aromatic hydrocarbons + quinones (PAHQs). Two of the nation's leading UFP authorities released a 2009 study finding that "[u]rban UFP contain a higher content per unit mass of polycyclic aromatic hydrocarbons, which are relevant organic constituents since they can induce oxidative stress…in human tissues after conversion to quinones…"25 Over the past decade, advancing science and measurement techniques have established that the PAHQs—which experts say are carcinogenic, cytotoxic, and genotoxic—"hitchhike" on the tiny particles, which carry them to the bloodstream and throughout the body to the organs.26 [EPA-HQ-OAR-2010-0799-9574-A3, p. 7]

Organization: Clean Fuels Development Coalition (CFDC)

P. 75112, OTHER HEALTH AND ENVIRONMENTAL IMPACTS ASSOCIATED WITH ADVANCEMENTS IN VEHICLE GHG REDUCTION TECHNOLOGIES. We strongly urge the Agencies to recognize the substantial body of evidence that links gasoline Aromatic Group Compounds to increasing levels of urban PM ($PM_{2.5}$, which includes the UFPs), which are coated with highly toxic polycyclic aromatic hydrocarbons and quinones (PAHQs). Attachment E summarizes and provides cites for just a few of the leading epidemiological and related studies that provide alarming evidence linking gasoline Aromatic Group Compound combustion products to premature births and infant mortality, a wide range of cancers, asthma and other respiratory diseases, cardiovascular and heart conditions, and even brain disorders and autism.

Many of the same PAHs found in secondhand cigarette smoke are found in gasoline exhaust (see cites 10, 11, and 12 of Attachment E), and for the tens of millions of Americans who live within 300 – 2,500 meters of congested roadways, there is no escape from the particle-bound toxics that originate from incomplete combustion of Aromatic Group Compounds.23 [Attachment E can be found in Docket number EPA-HQ-OAR-2010-0799-9574-A8] [EPA-HQ-OAR-2010-0799-9574-A3, p. 7]

Organization: Clean Fuels Development Coalition (CFDC)

In short, Aromatic Group Compounds are expensive to manufacture, and their costs escalate as crude oil prices rise. Aromatic Group Compounds would be even less cost competitive compared to Clean Octane alternatives if appropriate actions were taken to level the playing field, and Aromatic Group Compounds‘ true social costs were fully considered (under current policy, these costs are not borne by petroleum refiners as they should be, but rather by taxpayers and other industries in the form of higher health care spending and lost productivity, etc.). This is true even though budgetary pressures are forcing an end to tax incentives and other forms of public sector support for alternative fuel technologies. Examples of commercially available and cost-competitive Clean Octane alternatives to the Aromatic Group Compounds include: [EPA-HQ-OAR-2010-0799-9574-A3, pp. 4-5]

- Compressed natural gas (CNG), especially in centrally fueled fleets
- Biofuels, especially intermediate ethanol blends (e.g., E30+) [See Attachment B in Docket number EPA-HQ-OAR-2010-0799-9574-A5] [EPA-HQ-OAR-2010-0799-9574-A3, p. 5]

Organization: Clean Fuels Development Coalition (CFDC)

Consider the many shortcomings of Aromatic Group Compounds:

- Gasoline and finished product yield losses at the refinery due to the energy intensive requirements of the catalytic reformer
- High cost component which escalates as crude oil prices increase
- High carbon intensity component
- Incomplete combustion properties exacerbate wide range of tailpipe emissions
- Primary source of urban ambient particulate matter 9
- Primary source of urban polycyclic aromatic hydrocarbons (PAHs) and quinones (oxidative derivatives of Aromatic Group Compounds)10 that coat the UFP particles in $PM_{2.5}$
- Major culprit in combustion chamber deposits , which over time reduce vehicle efficiency and increase carbon and other harmful tailpipe emissions [EPA-HQ-OAR-2010-0799-9574-A3, p. 4]

Organization: Clean Fuels Development Coalition (CFDC)

Congress most certainly did not intend for EPA to reduce one non-health pollutant (CO_2) while inadvertently increasing emissions of one of the nation‘s more dangerous health pollutants (PM 2.5). As will be demonstrated below, extensive scientific evidence provides ample basis to “reasonably anticipate” that particulate emissions from Aromatic Group Compounds represent a serious health threat today, and one that is almost certain to get worse unless new fuel quality standards that complement new engine technologies are imposed. [EPA-HQ-OAR-2010-0799-9574-A3, p. 3]

Organization: Clean Fuels Development Coalition (CDFC)

ESTIMATED COST AND ECONOMIC BENEFITS. As referenced in Attachment B [see Docket number EPA-HQ-OAR-2010-0799-9574-A5], the 2008 – 2011 cost comparison of USGC spot toluene prices (a reference marker for Aromatic Group Compound pricing in general) and USGC ethanol prices shows that toluene prices have exceeded ethanol prices by an average of approximately $.70/ gallon over the three-year period, and more than $.80 per gallon over the past two years. (Q3 and Q4 in 2008 saw a precipitous drop in crude oil prices, from approximately $140 per barrel at its peak to $70+ per barrel at year-end. This global recession-induced plunge in oil prices had a direct, and aberrational, price depression effect on Aromatic Group Compounds.) As a March 2010 United Kingdom Department for Environment, Food, and Rural Affairs report confirmed, world corn prices also dropped precipitously during this period, in line with oil and other raw commodities, even though U.S. ethanol production actually increased, a relationship that clearly refutes the much-publicized but fallacious "food vs. fuel" attacks.30 The cost advantages of ethanol‘s Clean Octane compared to the Aromatic Group Compound‘s Dirty Octane, while impressive enough, pales in comparison to the enormous health benefits as well as reduced petroleum and carbon footprint benefits that would be achieved. Attachment F [see Docket number EPA-HQ-OAR-2010-0799-9574-A10] explains the basis of the table that extrapolates from EPA and Energy Future Coalition sources, and suggests that a gradual phase-down in Aromatic Group Compounds could save the public and private sectors more than $400 billion per year by 2025. [See Attachment G in Docket number EPA-HQ-OAR-2010-0799-9574-A11] In the final rule, we strongly urge the Agencies to take all of its these critically important cost-benefit factors into account, especially as the EPA reassesses its $PM_{2.5}$ SOA apportionment due to mobile sources based upon its new CMAQ modeling results. [EPA-HQ-OAR-2010-0799-9574-A3, pp. 8-9]

Organization: Boyden Gray & Associates PLLC

These factors suggest how EPA can avoid the impermissible side effect of this rulemaking that will increase traditional and life endangering PM pollution as the price for reducing CO_2. Rather than relying on the uncertain possibility of finalizing a future rulemaking to impose tailpipe PM restrictions, which may not in fact eliminate the secondary atmospheric reactions that cause most fine particle harm, EPA should use fuel efficiency concerns that ARE the subject of this proposal to solve this problem. This would involve the obvious step of reducing the most carbon intensive fuel components— aromatics—which would have positive outcome of reducing CO_2, eliminating the impermissible traditional pollutant increases, and providing needed octane, all at the same time. This could and should be done in this proceeding, which, as discussed above, needs in any event to make available the statutory incentives for the non-petroleum alternatives (which are also substitutes for toxic aromatics and the key to increasing clean octane—a necessary precursor to innovation in fuel-efficient internal combustion). [EPA-HQ-OAR-2010-0799-9506-A1, pp. 10-11]

Organization: Boyden Gray & Associates PLLC

Ozone and CO_2 itself are also implicated. Reducing aromatics reduces ozone as well as PM, since aromatics are highly reactive photochemically even if not highly volatile. Restriction of aromatics thus contributes more to ozone reduction than Reid vapor pressure (RVP) controls that address only the so-called “light-ends” like butane and pentane, since these are highly volatile but virtually unreactive.35 But EPA discourages this shift not only by blocking state VOC regulation and capping the effects of the multiplier for purposed of curbing oil imports, but also by penalizing ethanol and methanol by not making allowance for their air quality and other benefits. In fact, aromatics are 20% more carbon-intensive than gasoline, meaning that direct octane substitutes like ethanol and methanol, which are less carbon intensive, provide in fact as much as a 50% improvement over gasoline in CO_2, in addition to the PM, ozone and mileage improvements. [EPA-HQ-OAR-2010-0799-9506-A1, p. 10]

Organization: Boyden Gray & Associates PLLC

Finally, it is important to note that aromatics are more wasteful and, therefore, more expensive than gasoline, ethanol and methanol. The rule of thumb is that every point of octane generated by the reformers’ production of aromatics uses 1% percent of crude. In part as a result, the BTX group costs nearly one dollar more per gallon than regular gasoline. Therefore, EPA and DOE are incorrect to calculate ethanol’s or methanol’s fuel equivalency solely on the basis of BTU content, since upstream fuel consumption and accompanying pollution increases are relevant factors along with the increased efficiency allowed by the high octane of ethanol, methanol, and CNG. [EPA-HQ-OAR-2010-0799-9506-A1, p. 10]

Organization: Boyden Gray & Associates PLLC

EPA’s failure to address the issue of octane, aromatics and air toxics is curious in light of the Presidential directive to do so in Section 3 of the Presidential Memorandum of September 2010. Moreover, EPA acknowledges on page 6-32 of its DRIA that it “is important to quantify the health and environmental impacts associated with the proposed standard, because a failure to adequately consider these ancillary co-pollutant impacts could lead to an incorrect assessment of their net costs and benefits.” But the proposed rule itself is silent on the question. [EPA-HQ-OAR-2010-0799-9506-A1, p. 7]

Response:

In response to comments (most from Boyden Gray and Associates) that EPA should reduce the amount of aromatics in vehicular fuels to reduce secondary PM and photochemical ozone formation, those issues are beyond the scope of this proceeding. Furthermore, the innuendo that EPA is trading CO2 reduction for increases in PM and air toxics under this rule is not correct.

The rule does not result in increases to either the PM, ozone, or air toxics inventories, but rather to reductions. For PM, the results indicate that in 2030, a population weighted average reduction of approximately 0.01 ug/m3 can be expected (see RIA Chapter 6.3.1). For ozone, we estimate that in 2030, on a population-weighted basis, there is virtually no change in ambient concentrations in ozone.

In terms of health impacts, however, it is clear that upstream reductions in emissions related to ambient concentrations of both direct and indirect PM outweigh the slight emission increases associated with rebound driving (and none associated with fuel content, contrary to the commenter's statements). In terms of PM-related health impacts, we estimate that in 2030, emission reductions associated with the rule will result in between 110 to 280 fewer premature mortalities across the U.S. Compared to the estimate of 1 to 3 additional ozone-related premature mortalities associated with rebound-related emission increases, it is clear that upstream emission reductions outweigh the slight downstream emission increases and in fact improve health on a national basis.

EPA estimates the full range of pollution impacts from the standards, including emissions at the tailpipe and emissions from "upstream" sources such as power plants, refineries, and fuel transportation and distribution. Please refer to Preamble Section III.G.1 and RIA Chapter 4 for a complete description of the emissions impacts of the rulemaking and the estimation methodology. This includes both upstream and tailpipe VOC emissions associated with the final standards. We use these non-GHG inventories to estimate the changes in ambient concentrations of PM, ozone, and selected air toxics. Please refer to Chapter 6 of the RIA for a description of both the air quality modeling and health impact analyses. Taken together, the non-GHG emission changes yield a net reduction in human health risk and contribute to the overall benefits of the standards.

Furthermore, as ethanol use in gasoline has continued to rise in response to market forces and RFS, the additional octane provided by ethanol has been used by refiners to reduce the concentration of aromatics (another source of octane) in the gasoline they supply. As shown below in figure below, there has been a 15 percent decrease in aromatics with the rise in ethanol use over the past decade. With the increased use of ethanol, not only have the aromatic levels in gasoline been declining, but we project that they will continue to decline. The average level of aromatics in gasoline today is around 22 percent, although it ranges from 3 to 47 percent on a batch basis, and 10 to 40 percent on a refinery average basis due to the wide variation in refinery configuration, crude oil source, and available product markets.

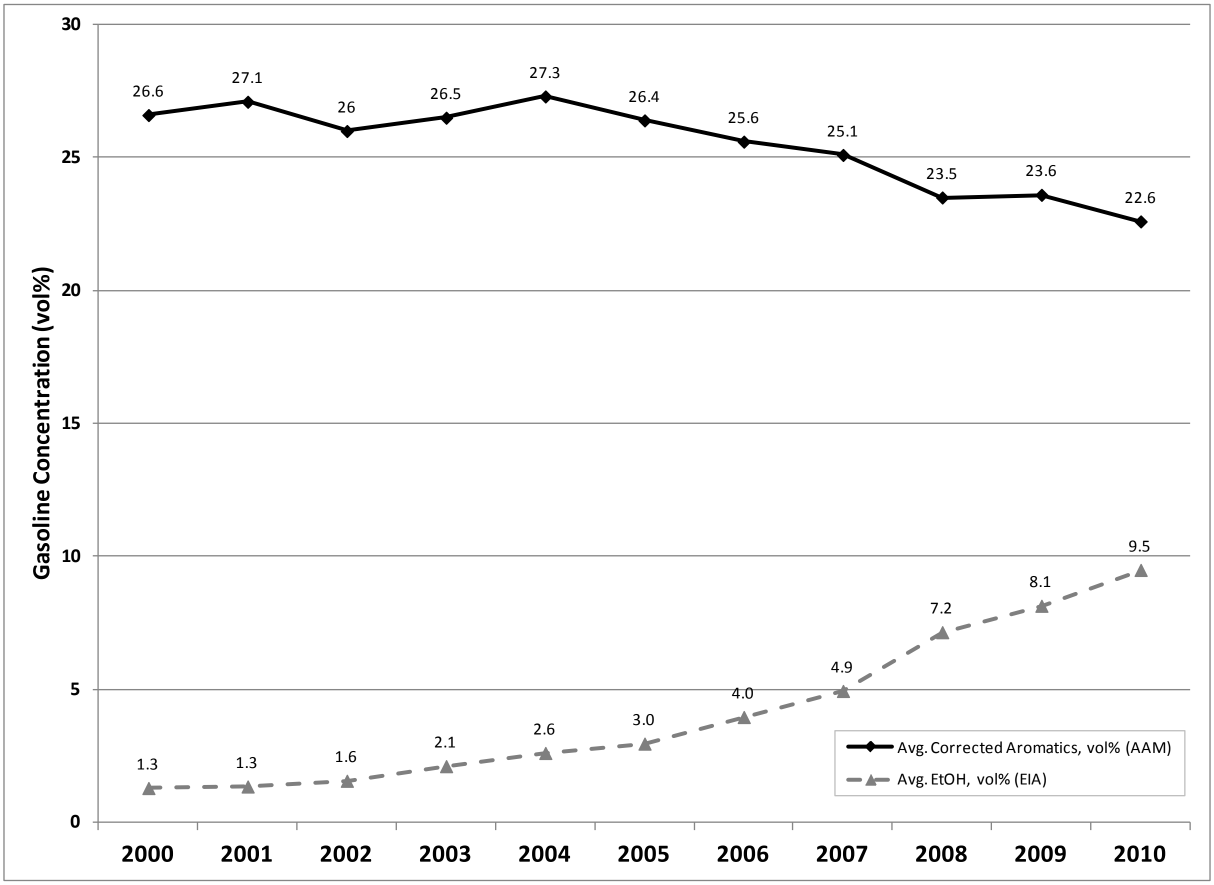

Figure: Aromatics and Gasoline Ethanol Concentration vs. Time

11.3. Need to harmonize in-use/certification fuels with LD GHG

Organizations contained in this section
American Petroleum Institute (API)
Mercedes-Benz USA, LLC
Pennsylvania Department of Environmental Protection
Volvo Car Corporation

Comments:

Organization: American Petroleum Institute (API)

Changes to the Test Fuel Used for Emissions and Fuel Economy Certification
EPA suggests that it may in the future consider changing the property specifications of the test fuel used to certify the emissions and fuel economy performance of new vehicles vis-à-vis the standards, and it specifically indicates that the fuel may include some unspecified amount of ethanol. API's fundamental position on the ethanol content of federal gasoline certification test

fuel remains unchanged from that conveyed in earlier comments on the MY 2012-2016 CAFE/GHG rule for light-duty vehicles: “The ethanol concentration of the certification reference fuel should match the fuel that vehicles are expected to use.”20 [EPA-HQ-OAR-2010-0799-9469-A1, p 9]

Organization: American Petroleum Institute (API)

Changes to the Test Fuel Used for Emissions and Fuel Economy Certification
EPA suggests that it may in the future consider changing the property specifications of the test fuel used to certify the emissions and fuel economy performance of new vehicles vis-à-vis the standards, and it specifically indicates that the fuel may include some unspecified amount of ethanol. API’s fundamental position on the ethanol content of federal gasoline certification test fuel remains unchanged from that conveyed in earlier comments on the MY 2012-2016 CAFE/GHG rule for light-duty vehicles: “The ethanol concentration of the certification reference fuel should match the fuel that vehicles are expected to use.”20 [EPA-HQ-OAR-2010-0799-9469-A1, p 9]

Organization: Pennsylvania Department of Environmental Protection

We believe that EPA should change the test fuel used for certifying emission standards of passenger cars and light-duty vehicles in the laboratory. For years, EPA has been using a gasoline for emissions testing that is never used by motorists to determine if a vehicle meets emission standards. We believe this leads to an unrealistic estimate of emissions and fuel efficiency. EPA needs to follow CARB’s lead and use a fuel for emissions testing that is more representative of what the nation's consumers use, such as a fuel that contains 10 percent ethanol. A representative fuel will produce more realistic emissions testing results and promote a firmer understanding of what emissions are produced in the mobile sector. [EPA-HQ-OAR-2010-0799-7821-A1, p. 4]

Organization: Mercedes-Benz USA, LLC

The National Program recognizes the importance of harmonizing regulatory programs. Reducing greenhouse gas emissions and enhancing energy independence depends upon coordinating the regulation of tailpipe emissions with the regulation of fuels. This includes not only enhancing the amount of renewable energy producing electricity to reduce upstream emissions associated with electricity generation, but also ensuring the availability of ultra-low sulfur fuels.[7] [EPA-HQ-OAR-2010-0799-9483-A1, p. A-4]

Ultra low sulfur gasoline is a key enabler for the incorporation of lean bum advanced combustion technologies that require dedicated lean NO_x after-treatment hardware. Ultra low sulfur gasoline also permits significant further fuel economy gains (8-10%) in downsized turbocharged engines by reducing the frequency and intensity of sulfur 'bum-off' cycles in exhaust after-treatment components otherwise needed to keep those devices at peak operating efficiency. DAG believes it to be feasible to achieve sulfur reduction in market fuels to 10 ppm. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-4]

Ultra low sulfur diesel fuel is also important. DAG, then as part of DaimlerChrysler, played a key role in the efforts to bring ultra low sulfur diesel fuel to the United States. These efforts were further supported when B5 biodiesel was specified as the factory fill for Jeeps equipped with the Mercedes-Benz 3.0L common rail diesel engine. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-4]

DAG remains concerned about state efforts to promote and mandate biodiesel blends of B10 or greater and encourages the EPA to employ a federal policy to promote B5 use nationwide. Doing so would create a foundation for engine, exhaust after-treatment and biodiesel technologies to mature as a system. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-4]

DAG supports EPA's efforts with regard to Tier 3, and California's efforts with regard to LEV 3, and looks forward to continuing to work with the agencies both to promote ultra low sulfur fuels and to address remaining concerns with those regulatory programs. [EPA-HQ-OAR-2010-0799-9483-A1, p. A-4]

---

7 The agencies properly take a Tank to Wheel approach to electric battery generation, applying a factor of 0 g/m for the electric generation. Automobile manufacturers are able to apply technology, and base their compliance, only on the vehicles they sell. Automakers have no control over the sources of electricity generation, an area that EPA has ample authority to regulate independent of tailpipe emissions. Emissions, moreover, should be treated the same. Upstream emissions from the production of oil are not included; nor should those from electric vehicles be included. Finally, any information relating to upstream emissions provided to the public should be provided with regard to all vehicles. The agencies should not include only 'net' upstream emissions beyond those applicable to ICE vehicles because doing so would mislead the public into believing that only EVs involve upstream emissions.

Organization: Pennsylvania Department of Environmental Protection

We believe that EPA should change the test fuel used for certifying emission standards of passenger cars and light-duty vehicles in the laboratory. For years, EPA has been using a gasoline for emissions testing that is never used by motorists to determine if a vehicle meets emission standards. We believe this leads to an unrealistic estimate of emissions and fuel efficiency. EPA needs to follow CARB's lead and use a fuel for emissions testing that is more representative of what the nation's consumers use, such as a fuel that contains 10 percent ethanol. A representative fuel will produce more realistic emissions testing results and promote a firmer understanding of what emissions are produced in the mobile sector. [EPA-HQ-OAR-2010-0799-7821-A1, p. 4]

Organization: Volvo Car Corporation (VCC)

The same criteria that govern the need for new test procedures to measure extremely low emissions adequately and correctly also dictate the need for low-sulfur fuel. It is essential to avoid sacrificing environmental gains achieved by use of advanced technology by failing to recognize the positive effect of higher quality fuel or the impact of sulfur on catalyst efficiency over time. Lower sulfur in fuel will also result in environmental gains for the existing fleet since the catalyst deactivation will be minimized. [EPA-HQ-OAR-2010-0799-9551-A2, p.15]

Response:

The LD GHG standards are based on current certification test fuel qualities and are not dependent on any changes occurring to certification test fuel qualities. If the certification test fuel is changed through a future rulemaking, EPA would be required to address the need for a test procedure adjustment to preserve the level of stringency of the CAFÉ standards. EPA is committed to doing so in a timely manner to ensure that any change in certification fuel will not affect the stringency of future GHG emission standards.

12. Technical Assessment of the Proposed CO_2 Standards

Organizations Included in this Section

National Association of Clean Air Agencies (NACAA)
Union of Concerned Scientists (UCS)

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 53.]

What we're hopeful about is that if new technologies come into vehicles are incorporated into vehicle design and production earlier, that then it will be shown that the cost of having those technologies in vehicles lessens the idea that, you know, you down the cost of -- as you move into production, you move down the cost in terms of implementing the technologies and the cost drops for production.

Organization: Union of Concerned Scientists (UCS)

The agencies based this proposal on rigorous, peer-reviewed technical analysis. We appreciate the continued commitment of the agencies to utilize independent technical analysis as well as information collected from manufacturers. In particular, UCS acknowledges the importance of the tear-down cost studies conducted by FEV, the technology effectiveness modeling conducted by Ricardo Engineering, and the mass-reduction and safety potential analysis conducted by Lotus. These studies represent the most up-to-date and highest quality work in these areas. Studies of these kinds were recommended by the National Academies as important tools in improving estimates of the cost and performance of new vehicle technologies.16 [EPA-HQ-OAR-2010-0799-9567-A2, pp. 5-6]

16 See, for example, Finding 3-3 and Finding 8-4 in the 2011 National Academies report, Assessment of Fuel Economy Technologies for Light-Duty Vehicles. [EPA-HQ-OAR-2010-0799-9567-A2, p. 5]

Response:

Regarding comments from NACAA, we fully expect that costs for GHG reducing technology will drop as these technologies are introduced and their production numbers increase. Our learning curve effect (see joint TSD 3.1.3) captures those anticipated reductions in cost.

Regarding comments from UCS, we fully agree that the many studies conducted and cited in support of our final standards—FEV teardowns, technology effectiveness modeling by Ricardo, and mass reduction studies by Lotus—are extremely important pieces of our rulemaking effort and represent the most up-to-date and highest quality work in these areas.

12.1. Baseline, Reference and Control Fleets for Evaluating Standards

Organizations Included in this Section

American Council for an Energy-Efficient Economy (ACEEE)
Chrysler Group LLC
Environmental Consultants of Michigan
Environmental Defense Fund (EDF)
International Council on Clean Transportation (ICCT)
Natural Resources Defense Council (NRDC)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Organization: American Council for an Energy-Efficient Economy (ACEEE)

BASELINE AND OTHER SCENARIOS

The agencies' baseline scenario assumes that fuel economy remains at 2016 levels absent the proposed new standards. However, NHTSA also "examines the impact of an alternative 'market-driven' baseline, which allows for some increases in fuel economy due to 'voluntary overcompliance' beyond the MY 2016 levels" (NPRM p.75167). NHTSA requests comment on this alternative baseline. [EPA-HQ-OAR-2010-0799-9528-A2, p.2]

There is little historical basis for a scenario in which there is a sustained increase in fuel economy in the absence of increases in standards. Public interest in fuel economy does shift with fuel prices, but even that interest typically has followed from large, rapid changes in price and has been short-lived. The fuel prices on which the various agency analyses are largely based are EIA projections and do not contain dramatic increases in price. Under these conditions, manufacturers not constrained by fuel economy standards historically have employed technological advances to increase vehicle power and acceleration, rather than to improve fuel economy. [EPA-HQ-OAR-2010-0799-9528-A2, p.2]

Incorrect specification of the baseline scenario will lead to an incorrect valuation of the proposed standards. An alternative baseline such as the one considered by NHTSA will reduce manufacturers' costs to meet the standards, because some of the added technology required to meet the standard will already appear in the baseline. At the same time, the benefits attributable to the standards will decline. The net effect is a reduction in the cost-effectiveness of the standards, because the most cost-effective technologies are the ones that will appear in the alternative baseline scenario, leaving the more expensive technologies for the rule to bring into the market. [EPA-HQ-OAR-2010-0799-9528-A2, p.2]

The same issue arises from EIA's AEO 2012 Early Release (EIA 2012), which projects an increase in new vehicle fuel economy after 2016 without adoption of the proposed rule, and without major increases in fuel prices. Roughly one-quarter of the reduction in new vehicles' fuel consumption that would result from the proposed standards appears in the AEO 2012 Reference Case. Hence it is all the more important that NHTSA clarify that the baseline scenario used in the NPRM should be the basis for evaluating the benefits of the final rule. [EPA-HQ-OAR-2010-0799-9528-A2, p.2]

Recommendations

Clarify that the baseline scenario used to evaluate the benefits of the rule will not assume "voluntary over-compliance" by manufacturers after 2016. [EPA-HQ-OAR-2010-0799-9528-A2, p.3]
Make available on the EPA web site the OMEGA outputs for the various scenarios considered. [EPA-HQ-OAR-2010-0799-9528-A2, p.3]

Organization: Chrysler Group LLC

The Agencies provide 2008MY and 2025MY sales projections for various manufacturers in Table II-1 of the NPRM. These projections show Chrysler with annual sales of ~1.7 million light-duty vehicles, dropping to 0.8 million light-duty vehicles in 2025; a 53% decline over 17 years. [EPA-HQ-OAR-2010-0799-9495-A1, p.21]

This negative projection of Chrysler's viability is problematic. In addition, to potentially affecting the analyses upon which the Agencies have based the proposed standards, projections of this type can also affect Chrysler's relations with our suppliers and customers. When suppliers and customers see projections, supported by Federal agencies, that indicate a 53% decline in sales, they are potentially given a highly negative view of the viability of the company. These negative views may result in less favorable contracts with suppliers and lower sales to customers. [EPA-HQ-OAR-2010-0799-9495-A1, p.21]

Organization: Environmental Consultants of Michigan

Advanced Technology Has Already Been Substantially Incorporated Into the Fleet [See Table 1 on p. 7 of Docket number NHTSA-2010-0131-0166-A1]

The Agency's arbitrary selection of a four year old data set is unconscionable. Manufacturers have already implemented into their product line many of the technologies recommended by the Agency at substantially higher costs. At a minimum the Agency must postpone promulgation of the final rule until it completely recalibrates their models using up to date data on the cost and benefits of new technology along with using an up to date baseline vehicle fleet. [NHTSA-2010-0131-0166-A1, p. 7]

Organization: Environmental Defense Fund (EDF)

B. FLAT 2016 BASELINE

EDF supports EPA's proposal to assume the reference case fleet in MY 2017–2025 would have fleet wide GHG emissions performance no better than that projected to be necessary to meet the

MY 2016 standards. Because EPA is using AEO2011 fuel price forecasts, which project relatively stable fuel prices over the next 15 years, it is reasonable to assume that manufacturers will not overcomply with the 2016 standards and/or consumers will not demand fuel economy greater than the 2016 standard. It is also reasonable to assume that fleetwide overcompliance will not occur because any voluntary over-compliance by one company would generate credits that could be sold to other companies to substitute for their more expensive compliance technologies. Therefore, the ability to buy and sell credits would eliminate any over-compliance for the overall fleet. [EPA-HQ-OAR-2010-0799-9519-A1, p. 8]

Organization: International Council on Clean Transportation (ICCT)

6) Baseline Assumption Sensitivity Case

There is a difference between how EPA and NHTSA handled the modeled Reference Fleet Scenario. EPA projects that in the absence of the proposed GHG and CAFE standards, the reference case fleet in MY 2017-2025 would have fleetwide GHG emissions performance no better than that projected to be necessary to meet the MY 2016 standards. [EPA-HQ-OAR-2010-0799-9512-A1, p. 18]

While NHTSA used the same baseline assumptions for their primary analyses, they also conducted a sensitivity analysis with an alternative baseline, which assumed that fuel economy would continue to increase after 2016 without regulation. NHTSA stated:

'The assumption is that the market would drive manufacturers to put technologies into their vehicles that they believe consumers would value and be willing to pay for.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 18]

Again, while sensitivity analyses can illuminate the impacts of important uncertainties, there is little or no evidence supporting this particular case. Except during the oil crisis in the 1970s and a brief period for passenger cars in the late 2010s, the market has never driven improvements in vehicle fuel economy. Even these two examples are not relevant to the current situation. The demand for higher fuel economy in the 1970s was driven primarily by fears of oil unavailability and ongoing future increases in fuel price. The modest increase in passenger cars in the late 2010s followed 20 years of unchanging CAFE standards. Thus, NHTSA's sensitivity analysis inappropriately calculates a lower estimate of net benefits of the rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 18]

The proposed 2017-25 standards follow aggressive increases in standards from 2011 through 2016. Further, the change to a footprint-based standard means that all manufacturers must increase the efficiency of their vehicles to comply, even manufacturers of primarily smaller vehicles. Thus, the 2012-16 standards have already driven the market beyond the level of efficiency it would have demanded in the absence of standards. [EPA-HQ-OAR-2010-0799-9512-A1, p. 18]

The reason why efficiency standards are effective and needed is consumer discounting of uncertain, future fuel savings, as explained above. Efficiency standards move the market from the level of efficiency demanded by loss averse consumers to the level of efficiency desired by society. It will be many years after 2016 before additional technology development and lower cost will finally fall to the level demanded by consumers from the higher level demanded by society through efficiency standards. The historical precedent is that it took 20 years of unchanging CAFE standards combined with high real and nominal fuel prices before the market started to demand additional fuel economy for passenger cars in the late 2000s. [EPA-HQ-OAR-2010-0799-9512-A1, p. 19]

ICCT recommends that the sensitivity analysis for market-driven increases in efficiency after 2016 be removed from the Final Rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 19]

Organization: Natural Resources Defense Council (NRDC)

A. Baseline Projection

NRDC supports the baseline forecast for MY 2017 and beyond that assumes manufacturers meet but do not exceed the MY 2016 standards. Voluntary overcompliance—in which manufacturers apply efficiency technology in excess of what is needed to meet the MY 2016 standard—is possible but too uncertain to be incorporated in a baseline projection. Rapidly rising fuel prices are potentially a reason for overcompliance but during periods of only modest average annual price increases, overcompliance was not widespread. In the 1990’s and early 2000’s, real motor gasoline prices rose at an average rate of 4 percent per year yet full-line manufacturers, such as the GM, Ford and Chrysler, applied just enough technology to meet the standards. From 2017 to 2035, EIA projects motor gasoline prices that increase at a lower rate of about 1 percent per year. With the projected low rate of annual price growth, the modification of the 2016 baseline is unjustified.

Further, NRDC disagrees with NHTSA that a sensitivity analysis of voluntary overcompliance is warranted, and we recommend that it be excluded from the final rule. The voluntary overcompliance analysis is counter-productive to the goals of maximizing petroleum reductions as required by EPCA.

If, in future rulemakings, the baseline was altered to account for voluntary overcompliance—assuming it can be reasonably justified as highly likely—NHTSA would be inclined to set a lower standard than what could be achieved with appropriate cost-effective technology application. The achievement of overcompliance assumes that low-cost efficiency technologies are applied by manufacturers first (NHTSA assumes a 1-year payback). The remaining technologies to be driven by the standard would therefore be more expensive, increasing the costs associated with the standards. The standards themselves would also be associated with lower benefits because the savings from lower-cost technologies would be assigned to the market instead of the standard. The resulting reduced benefit-to-cost ratio would be a dampening force on efforts to maximize fuel efficient technology adoption and could push down the standard stringency.

If, during this scenario of a weaker standard, automakers did not overcomply, U.S. petroleum consumption would be higher and counter to the mandate of EPCA. To avoid this situation, NHTSA and EPA should continue to use a baseline that assumes automakers do not overcomply. This ensures that standards are set as strong as possible, and it provides greater certainty that needed oil consumption and GHG emission reductions will be achieved.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Use a flat baseline in assessing post 2016 fuel efficiency: NHTSA is taking comment on the notion that the post-2016 baseline for vehicle standards should assume “market driven” improvements in fuel economy absent standards and account for those improvements in the baseline. The Knittel study, referenced above, in addition to the historic trend are evidence that absent standards automakers will not increase gas mileage. Leading up to 2008, automakers were not prepared for increasing fuel prices and shifting consumer preferences. The consequences to the auto industry and the economy were devastating. [EPA-HQ-OAR-2010-0799-9549-A2, p. 7]

NHTSA’s consideration that new vehicle labels that will provide consumers with more detailed information on mileage and savings and that this will influence consumer choices is insufficient basis for using a baseline that presumes automakers will apply technologies to meaningfully improve gas mileage beyond 2016 absent strong final 2017-2025 standards. While some automakers may voluntarily “over-comply” with the 2012-16 program due to market forces, overcompliance in one segment of a fleet (cars for example) could be used to offset lower mileage vehicles such as larger pickups and SUVs. In addition, because the compliance with the program allows for banking, trading and carry-forward and backward credits, any presumption that automakers will improve fuel economy after 2016 could be part of a compliance strategy that includes the 2012-16 model years or planned compliance with these proposed standards. Over-compliance across the entire fleet heading into the mid-term review included in the NPRM would support strengthening the overall program. The agencies should use a flat baseline beyond 2016. [EPA-HQ-OAR-2010-0799-9549-A2, p. 7]

Organization: Volkswagen Group of America

Volkswagen recognizes that the agencies are privy to confidential product plans supplied by manufacturers and that the agencies rely on this data to support future projections. However, the US has been averaging a near 50/50% split between cars and trucks for many years. Even at times of peak gasoline prices experienced during the past few years, interest in light trucks may have waned, however not to such a drastic extent as indicated by this radical shift in future product plans. Most disturbing is the recent trend back to light trucks even with fuel prices stabilizing near record highs. Volkswagen sees no evidence that would suggest a near 30% decline in truck market share from domestic OEMs. [EPA-HQ-OAR-2010-0799-9569-A1, p. 9]

Volkswagen is not privy to strategic plans by competitors, but we find it unlikely for OEMs historically focused on truck sales to so readily abandon what has proven to be a successful and profitable market segment. Dropping 30% truck share for a company like Ford would be equivalent to Ford cancelling their entire line-up of F150s, a vehicle which has remained a top, if not the top, seller in the US for many years. In addition, the proposals preferential treatment for large trucks and pick-ups further makes it unlikely that manufacturers would now prefer to market cars. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 9-10]

Response:

Response to Chrysler LLC:

The agencies' projection that Chrysler's sales would steadily decline was primarily attributable to the manufacturer- and segment-level forecasts provided in December 2009 by CSM. The agencies thought that forecast to have been credible at the time considering economic and industry conditions during the months before CSM provided the agencies with a long-range forecast, when the overall light vehicle market was severely depressed and Chrysler and GM were—with nascent federal assistance—in the process of reorganizing. We recognize that Chrysler's production has since recovered to levels suggesting much better long-term prospects than forecast by CSM in 2009. While the agencies are continuing to use the market forecast developed for the NPRM (after minor corrections unrelated to Chrysler's comments), we are also using a second market forecast we have developed for today's final rule, making use of a newer forecast (in this case, from LMC) of manufacturer- and segment-level shares, a forecast that shows significantly higher sales (more than double that of the earlier forecast) for Chrysler in 2025. This analysis is shown in Joint TSD Chapter 1.5 and the EPA modeling results are shown in RIA Chapter 10. We note further that the agencies have documented the differences in volume and characteristics of the MY 2008 based fleet and the MY 2010 based fleet, and these differences do not justify any change in the ultimate standards. See Joint TSD section 1.5. Likewise, EPA concluded that "these two market forecasts contain certain differences, although as discussed in TSD Chapter 1.5, the differences are not significant enough to change the agencies' decision as to the structure and stringency of the final standards, and indeed corroborate the reasonableness of the final standards." See Joint TSD Chapter 1.5.

Response to Environmental Consultants of Michigan

Even though the year of publication of this rule is 2012, model year 2010 was the most recent baseline dataset available due to the lag between the actual conclusion of a given model year and the submission (for CAFE compliance purposes) of production volumes for that model year. Moreover, as explained below in the joint TSD and in our respective RIAs, EPA and NHTSA measure the costs and benefits of new standards as incremental levels beyond those that would result from the application of technology given continuation of baseline standards (*i.e.*, continuation of the standards that will be in place in MY 2016). Therefore, our analysis of manufacturers' capabilities is informed by analysis of technology that could be applied in the future even absent the new standards, not just technology that had been applied in 2008 or 2010. This can be seen from the similarity in projected costs between the analyses shown in section III.D (MY 2008 based forecast) and RIA chapter 10 (MY 2010 based forecast).

Response to Environmental Defense Fund (EDF), International Council on Clean Transportation (ICCT), Sierra Club, Environment America, Safe Climate Campaign, Natural Resources Defense Council (NRDC), American Council for an Energy-Efficient Economy

(ACEEE), and Clean Air Council is in Preamble section III.D.1.a. In short, we agree with all of the commenters addressing the issue that the assumption of a flat baseline absent post-MY 2016 GHG standards for these vehicles has full historic and empirical justification.[22]

Response to Volkswagen Group of America

The actual decline agencies projected was 23%, mostly due to falling sales from Chrysler (65%). NPRM's 2008 baseline fleet was created using CSM Automotives 2009 projections market share/model mix, and AEO 2011 sales volumes and car/truck split. The forecast from CSM was greatly influenced by Chrysler's bankruptcy and accounts for the majority of the decline in trucks. For the final rulemaking, the agencies created an alternative fleet using 2010 CAFE data, a future fleet projection from LMC (JD Powers) Automotives 2011 projections of market share/model mix, and AEO 2012 sales volumes and car/truck split.

12.2. Types of Technologies Considered and Their Effectiveness

Organizations Included in this Section

Alliance of Automobile Manufacturers
BMW of North America, LLC
Center for Biological Diversity
Eaton Corporation
Honeywell Transportation Systems
International Council on Clean Transportation (ICCT)
Jackson, F.W.
Manufacturers of Emission Controls Association (MECA)
Volkswagen Group of America

Organization: Alliance of Automobile Manufacturers

Examples of anticipated battery technology breakthroughs include energy storage and management as well as power electronics capabilities; new battery chemistries and materials; new types of charging and faster charging; and advances in smart grid technology. Additional anticipated breakthroughs include the emergence of new, low-global warming potential fuels; high-efficiency transmissions; new down-weighting technologies and light-weight materials. The agency should also evaluate the ability to meet increasingly stringent criteria pollutant standards using new combustion technologies for advanced internal combustion engines. [EPA-HQ-OAR-2010-0799-9487-A1, pp.18-19]

[22] See also Comments of VW p. 14: "As shown in Figure 2-4, following fuel price increases in early 2000's, there was a notable uptick in customer interest of hybrid vehicles. The fuel price spikes in 2007-2008 timeframe even brought about irrational consumer behavior in which customers traded-in large trucks to purchase small cars, sometimes at considerable loss. However as fuel prices stabilized in the mid $3 per gallon range, sales in larger vehicles and pick-up trucks returned. Often customers who had moved into smaller vehicles complained about the lack in comfort and space of the smaller cars".

Organization: BMW of North America, LLC

Many of the technologies mentioned in the draft joint TSD are already implemented in BMW Group models or will be implemented for compliance with the standards for MYs 2012-16. This high implementation rate of advanced conventional technologies will make it more challenging for BMW to comply with' proposed future standards. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 5]

This is confirmed by the projected electrification market share for each automaker by the US agencies. The market share of EV, PHEV and HEV for the BMW Group and thus the application of very cost-intensive technologies is one of the highest among all automakers. EPA confirms that'....larger volume manufacturers have levels of advanced technologies that are below the phase-in caps. Smaller 'luxury' volume manufacturers tend to require higher levels of these technologies, BMW, Daimler...... all reach the max. penetration cap for HEVs (30%) in 2021.' [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 5]

This appears to be a double penalty because in order to comply with the proposed standards, those manufacturers must invest in expensive technologies and then force their higher fleet penetration. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 5]

Organization: Center for Biological Diversity

2. The Agencies must set standards that are technology forcing

There is no doubt that EPCA is a technology-forcing statute. EPCA is meant to encourage technological innovation – meaning new technologies, not simply better versions of what exists today. As the court in Center for Auto Safety v. Thomas noted, “[t]he experience of a decade leaves little doubt that the congressional scheme in fact induced manufacturers to achieve major technological breakthroughs as they advanced towards the mandated goal.” 19 As explained by the court in Kennecott Greens Creek Min. Co. v. Mine Safety and Health Admin., “when a statute is technology forcing, the agency can impose a standard which only the most technologically advanced plants in an industry have been able to achieve – even if only in some of their operations some of the time.”20 With regard to a similar technology-forcing statute, the Clean Air Act, legislative history indicates that the primary purpose of the Act was not “to be limited by what is or appears to be technologically or economically feasible,” which may mean that “industries will be asked to do what seems impossible at the present time.”21 [EPA-HQ-OAR-2010-0799-9479-A1, p. 5]

Yet, instead of stressing that EPCA and EISA are technology forcing and intended to create technological innovation, the Agencies discuss “technological feasibility” by remarking that they are “not limited in determining the level of new standards to technology that is already being commercially applied at the time of the rulemaking.”22 This formulation of the Agencies’ duties entirely misconstrues Congressional intent. To be technology forcing, the Agencies must not limit themselves to technology already applied at the time of the rulemaking but instead must drive technological innovation. This mandate has become of utmost importance because the next ten years or so constitute a critical decade in which to avert the most dangerous consequences of climate change, and because the Agencies have chosen to set standards over a period spanning that entire decade and the following five years, an unprecedented time frame in the history of CAFE. Standards that are built solely on technologies already in use today or projected to be in use a few years from today, violate this mandate per se. [EPA-HQ-OAR-2010-0799-9479-A1, p. 5]

E. The Preferred Alternative Does Not Represent the Maximum Feasible Fuel Efficiency Standard

The rulemaking requires insufficiently stringent technological improvements as it does not reflect the historical speed of technological improvements in practically every industry over the last decades, including in the automotive industry, a trend that will undoubtedly continue in the future; as it improperly excludes the impact of technologies under development or in the research stage; and as it does nothing to force technological innovation. The failure to take these developments into account is especially egregious in a rulemaking spanning the next decade and a half. If these factors were properly accounted for, the Agencies would recommend Alternative 4 rather than the preferred alternative. [EPA-HQ-OAR-2010-0799-9479-A1, p. 19]

The Agencies state that with only a few exceptions, the technologies considered here are the same as those in the MY 2012-2016 rulemaking. This approach is completely inadequate for a rulemaking reaching nine years beyond that date. They also state that the technologies they have considered are limited to currently existing technologies and improvements to them that either are or will be available within the rulemaking timeframe. In fact, they have no such thing, as they admit that that they have only considered technologies “expected to be in production in the next 5-10 years.” Since this rulemaking will extend considerably beyond that time frame, this approach is inadequate. In addition, because the CAFE statutes are technology forcing and the rulemaking period is extraordinarily long, the Agencies must also consider technologies in the research phase. [EPA-HQ-OAR-2010-0799-9479-A1, p. 19]

Defending their refusal to consider research stage technologies, the Agencies point to uncertainties involved in the availability and feasibility of implementing them with significant penetration rates. But since the Agencies have taken it upon themselves to set standards 14 years into the future, it is their responsibility to assess those uncertainties within reasonable ranges, and include the clearly foreseeable impact of technological innovations rather than to disregard research-stage technology altogether. Moreover, it is certain that the rate of innovation will continue at least at the speed of the last decade, and that technologies now in the research stage and many not yet conceived will be in existence in 2025 and much before then. In turning a blind eye to research that is sure to bear results 14 years from now, the Agencies ignore their mandate. [EPA-HQ-OAR-2010-0799-9479-A1, p. 20]

---

19 847 F.2d 843, 870 (D.C. Cir. 1988) (overruled on other grounds); see also Green Mt. Chrysler Plymouth Dodge Jeep v. Crombie, 508 F. Supp. 2d 295, 358-59 (D. Vt. 2008) (discussing technology-forcing character of EPCA and the use of increased fuel efficiency to augment performance rather than mileage). [EPA-HQ-OAR-2010-0799-9479-A1, p. 5]

20 476 F.3d 946, 957 (D.C. Cir. 2008). [EPA-HQ-OAR-2010-0799-9479-A1, p. 5]

21 116 Cong. Rec. 32901-32902(1970), Legislative History of the Clean Air Amendments of 1970 (Committee Pring complied for the Senate Committee of Public Works by the Library of Congress), Sr. No. 93-18, p. 227 (1974); see also Whitman v. American Trucking Associations, 531 U.S. 457, 491 (2001). [EPA-HQ-OAR-2010-0799-9479-A1, p. 5]

92 NPRM, 76 Fed. Reg. 74922. [EPA-HQ-OAR-2010-0799-9479-A1, p. 19]

93 NPRM, 76 Fed. Reg. 74958. [EPA-HQ-OAR-2010-0799-9479-A1, p. 19]

94 NPRM, 76 Fed. Reg. 74922. [EPA-HQ-OAR-2010-0799-9479-A1, p. 19]

95 NPRM, 76 Fed. Reg. 74922. [EPA-HQ-OAR-2010-0799-9479-A1, p. 20]

Organization: Eaton Corporation

• Allows OEM and vehicle component suppliers to provide vehicle solutions that advance fuel economy and emissions technologies that are affordable and maintain or increase performance of the vehicle. [EPA-HQ-OAR-2010-0799-9494-A1, p. 2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 186.]

Eaton appreciates the agency's use of sound economic analysis and in-depth technology reviews during the rulemaking process. We believe that the framework outlined in the NPRM is a good step towards the final regulation that will foster innovation, foster both technology and competition while maintaining fleet diversity and incentivizing over-achievement of emissions and fuel economy targets. It is important that certain principles outlined in the notice are further developed in the upcoming period.

Organization: Honeywell Transportation Systems

The agencies have recognized three levels of technology availability: (1) technologies available in the market in the near term, (2) technologies that are not yet in production but that are under development and that may be available for deployment within the next 5 to 10 years, and (3) technologies that are in the initial stages of research. (Draft Joint Technical Support Document, p. 3-1). Included within the group of technologies that are currently under development and that may be available during the model years covered by this rulemaking are downsized and turbocharged engines operating at combustion pressures significantly higher than today’s turbocharged engines. Id. A high-performance credit would provide an incentive to encourage further deployment and use of these technologies. [EPA-HQ-OAR-2010-0799-9474-A1, p.5]

Honeywell strongly supports a technology neutral approach to regulation and to incentivizing new technology. [EPA-HQ-OAR-2010-0799-9474-A1, p.6]

Organization: International Council on Clean Transportation (ICCT)

1. Cost-effective opportunities to reduce fuel consumption and climate change emissions in the near term are far larger than most people realize. Thanks to computer aided design and computer controls, the pace of technology development is accelerating and much of the underlying data in the technology assessments is already out of date or is only representative of near term vehicles. Meeting the standards will be easier and will cost less than assumed in the proposed rule and no rollback of the stringency should be considered. [EPA-HQ-OAR-2010-0799-9512-A1, p. 2]

1) Technology Benefit and Cost Assessments

The ICCT supports the proposed standard stringency. However, it is important to understand that the simulation modeling used to assess future technology benefits is actually quite conservative and that the future technology benefits will be larger than projected and the costs lower. This is due to rapid improvements in computer-based tools, which are opening up technology gains that were never possible before. Computer simulations and computer-aided design are enabling vastly improved designs and technologies. On-board computer controls provide unprecedented integration of engine, transmission, and hybrid operation. Instead of slowing down, the pace of technology development just keeps accelerating. [EPA-HQ-OAR-2010-0799-9512-A1, p. 4]

The sophistication of assessing technology efficiency improvements has been increasing as well. The 2001 National Research Council report applied technologies stepwise to estimate fuel economy improvement possible through regulations. Some manufacturers criticized this method, claiming it could overestimate fuel economy benefits because it does not account for synergies between technologies. This is especially important as more technologies are added to the vehicle. The next step in sophistication is the use of 'lumped parameter' models that can account for first-order interactions between technologies. These models can assess the effects of technology in a broad array of vehicle types and for a class of vehicles. However, this method is generally limited to 'proven' technologies. This was fine as long as standards were set only a few years in advance, but it is not adequate for setting standards with longer leadtimes. [EPA-HQ-OAR-2010-0799-9512-A1, p. 5]

Full-system simulation modeling is needed to capture the physics of the vehicle and powertrain system and assess interactions of the various components. It can also assess new technologies or combinations of technologies when experimental data are sparse. The 2011 National Research Council report on light-duty vehicle technologies supported the need for full-system modeling:

'The committee thinks that the most accurate method of analyzing potential reductions in fuel consumption, which considers the extent to which any of the efficiency improvements or energy loss reductions identified above can be realized while maintaining energy balance criteria, utilizes full system simulation (FSS).'1 [EPA-HQ-OAR-2010-0799-9512-A1, p. 5]

To support development of 2025 standards, EPA contracted with Ricardo Inc. to conduct such simulations. Ricardo is a highly respected engineering organization that does the vast majority of its work for OEMs and suppliers. [EPA-HQ-OAR-2010-0799-9512-A1, p. 5]

ICCT was involved with this simulation modeling from the beginning, including providing the initial contract for Ricardo to start work, hiring independent experts to review Ricardo's hybrid control simulations, and participating along with CARB on an advisory committee. After intensive involvement in the simulation process for the last two years, it is clear to us that the technologies being assessed by Ricardo are on the conservative side. In fact, this is unavoidable due to the restriction to currently available data and engine maps. Engine technology is improving much faster than we can keep up with and engines better than those modeled by Ricardo are already in development. [EPA-HQ-OAR-2010-0799-9512-A1, p. 5]

• The diesel maps used by Ricardo for the US simulations are already out of date and ICCT has contracted with Ricardo to rerun the diesel simulations for Europe using maps representative of the latest diesel technology. [EPA-HQ-OAR-2010-0799-9512-A1, p. 5]

• The engine map used by Ricardo for the gasoline engine with boosted-EGR is similar to the single-stage turbocharger engine map developed by the HEDGE consortium two years ago, which is already out of date. The map used by Ricardo in the simulations for a two-stage turbocharger is shown in Figure 2 below. Figure 3 shows a boosted-EGR engine map provided by the HEDGE consortium in February 2010 for a single-stage turbocharger. The minimum brake-specific fuel consumption (BSFC) for the HEDGE engine is about 4% lower than the map used by Ricardo in the simulations. While the engine map used by Ricardo has broader BSFC contours and better efficiency at low loads, the single-stage turbocharger could not provide sufficient air under all conditions and was boost limited. The HEDGE consortium is already working on a two-stage turbocharger system that will enable larger amounts of EGR, higher compression ratio, lower minimum BSFC, and a broader range of lower fuel consumption. [See Figure 2 on p. 6 and Figure 3 on p. 7 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, pp. 5-6]

This rapid technology improvement can also be seen by looking at historical data. For example, the 2001 National Research Council report found that turbocharging and downsizing would improve fuel economy by 5 to 7 percent. The most recent estimates in the draft RIA found that turbocharging and downsizing alone will provide a 12 to 15 percent improvement with 33 percent downsizing and16 to 20 percent for higher-pressure turbos with 50 percent downsizing. This 2 to 3 times increase in the efficiency benefit of turbocharging is not due to the older estimates being wrong, but rather to rapid improvements in combustion and turbocharging technology over the last 10 years. In addition, adding cooled and boosted EGR, a technology that wasn't even considered 10 years ago, is estimated to increase the benefits of turbocharging to 20 to 24 percent, or a 4 times increase. [EPA-HQ-OAR-2010-0799-9512-A1, p. 7]

This dramatic improvement in turbocharger systems also applies to cost. The estimated manufacturing cost for a turbocharger system, including downsizing but without a reduction in the number of cylinders, for 2017 in the proposed rule is $478. This compares with an estimated manufacturing cost of $815 from NHTSA just three years ago for the 2011 CAFE standards. Other costs estimates have also fallen dramatically in the last three years:

• 6-speed automatic transmission cost for 2011 CAFE standard was a $215 cost increase, compared to a $13 cost decrease in the proposed rule.

• Dual-clutch automated transmission was a $145 cost increase for the 2011 standard, compared to a $205 cost decrease in the proposed rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 8]

It should also be noted that the estimated costs in the proposed rule to comply through 2020 are less than half of the estimated costs to comply in 2025. Passenger car costs for 2020 are $885 compared to $2,023 for 2025 and light truck costs for 2020 are $688 compared to $1,578 for 2025.3 ICCT is confident that continued technology development will reduce costs in the future and that the midterm review will find that the current estimates of compliance costs in 2025 are greatly overstated. [EPA-HQ-OAR-2010-0799-9512-A1, p. 8]

ICCT is also paying FEV to do additional teardown cost assessments in connection with our work in Europe. These include updating the P2 hybrid costs and new cost assessments for advanced diesel engines, basic stop-start systems, manual transmissions, and cooled EGR systems. P2 costs in the proposed rule are overstated, as the system size is not reduced to maintain constant performance, cost savings from deleting the torque converter are not subtracted from the system cost, and future hybrid batteries will be smaller and cheaper due to new Li-ion chemistries with much higher power to energy ratios. All of the FEV results will be shared with EPA and NHTSA as they become available. [EPA-HQ-OAR-2010-0799-9512-A1, p. 8]

The 2025 rules are 13 years away. With the rapid improvements in technology due to computer-enhanced development, it would be completely irrational to assume that there will be no further technology improvements beyond what is known today. Thus, the efficiency and cost estimates in the draft rule are quite conservative and there should be no consideration to rolling them back. [EPA-HQ-OAR-2010-0799-9512-A1, p. 8]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 31.]

Another area where costs included in the draft are too high are those for the parallel or P2 hybrid. The P2 systems evaluated by FEV for EPA assumed no reduction in IC engine size, no reduction in battery size, and did not account for the cost savings due to removing automatic transmission torque converter. The ICCT is presently engaged in an exercise to evaluate the cost of P2 systems with these issues in mind, and we expect, at least, that the updated P2 costs will be lower than the agency estimates. These updated costs should be included in the final rulemaking.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 193-195.]

The opportunities to improve efficiency in the near term are far larger than most people realize. The internal combustion engine is widely perceived as century-old technology that is at the end of its development, but the reality is exactly the opposite. Computer simulations, computer-aided design are enabling vastly improved designs and technologies. On-board computer controls provide unprecedented integration of engine, transmission and hybrids operation. Instead of slowing down, the pace of technology development just keeps accelerating.

The sophistication of assessing technology efficiency improvements has been increasing as well. To support development of the 2025 standards EPA contracted with Ricardo to conduct full-system simulation modeling of the latest technology developments.

ICCT has been intensively involved in the simulation modeling process for the last two years. It is very clear to us that the technology being assessed by Ricardo are on the conservative side. In fact, this is unavoidable due to the restriction to the currently available data and engine maps.

This rapid technology improvement can also be seen by looking at historical data. The 2001 Natural Research Council report found that turbocharging and downsizing could improve fuel economy by 5 to 7 percent. The most recent estimates in the draft RIA found this benefit is now two to three times higher. This is not due to the older estimates being wrong, but rather to rapid improvements in combustion and turbocharging technology over the last 10 years.

By comparison, the 2025 rules are 13 years away. The efficiency estimates in the draft rule are actually quite conservative and there should not be any consideration of rolling them back.

Computer simulations will especially impact lightweight material design. In the past optimization of materials was a long, slow process of gradually changing a few parts of the time to avoid unanticipated problems with safety, ride, noise and vibration.

---

1 Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy; National Research Council, ISBN-13: 978-0-309-15607-3, 260 pages, 81/2 x 11, 2011.

3 Preamble, Tables IV-110 and IV-111.

Organization: Jackson, F.W.

5. Comparing against current 2010 poor 27 mpgge fleet is an easy target to look better against; vs. currently on books 35.5 mpgge or better yet what other things could be done to, in addition to or in lieu of stated EPA designs, Le., how complete and objective is the EPA analyses. While I'd agree many of the EPA items in aggregate should improve the product mpgge significantly I also believe there are other items not mentioned in EPA's list, see below my lists [see pp. 4-5 of Docket number] for Mid and Max technologies that need to be fairly considered. When all fairly considered I believe a 2025 54.5 mpgge can be built without plug-ins and I believe even without HEVs and with minimum ethanol! [EPA-HQ-OAR-2010-0799-8041-A1, p. 2]

Organization: Manufacturers of Emission Controls Association (MECA)

Implicit in federal and state greenhouse gas emission analyses is the ability of these advanced powertrain options to meet the applicable criteria pollutant emission standards, such as CO, NO_X, and non-methane organic gases (NMOG). All of these advanced, light-duty powertrain options combined with the appropriately designed and optimized emission control technologies can meet all current and future federal and state criteria emission requirements. In this manner, advanced emission controls for criteria pollutants enable advanced powertrains to also be viable options for reducing greenhouse gas emissions. A range of powertrain technologies, including engine turbochargers, exhaust gas recirculation systems, advanced fuel systems, variable valve actuation technology, advanced transmissions, hybrid powertrain components, and powertrain control modules that can be applied to both light-duty gasoline and diesel powertrains to help improve overall vehicle efficiencies, reduce fuel consumption, both of which can result in lower CO_2 exhaust emissions. In many cases, the application and optimization of advanced emission control technologies on advanced powertrains can be achieved with minimal impacts on overall fuel consumption. Auto manufacturers will also take advantage of synergies between advanced emission control technologies and advanced powertrains to assist in their efforts to optimize their performance with respect to both greenhouse gas and criteria pollutant exhaust emissions. [EPA-HQ-OAR-2010-0799-9452-A3, p.2]

Future light-duty diesel powertrains will continue to use emission control technologies like diesel particulate filters, NO_X adsorber catalysts, and selective catalytic reduction catalysts to meet EPA's light-duty exhaust emission standards. Emission control manufacturers are working with their auto manufacturer partners to further optimize these emission control technologies to be more effective at reducing criteria pollutants and play a role in reducing vehicle greenhouse gas emissions. Advanced diesel emission control technologies like particulate filters with lower backpressure characteristics, SCR catalysts with improved performance at lower exhaust temperatures, and SCR catalyst coated directly on particulate filter substrates are examples of emerging diesel emission control technologies that will allow future diesel powertrains to not only be as clean as gasoline engines from a criteria pollutant perspective, but deliver improved fuel consumption characteristics and lower greenhouse gas emissions. The use of diesel particulate filters also delivers significant reductions in black carbon emissions from diesel engines, a combustion emission that also has important climate change impacts. [EPA-HQ-OAR-2010-0799-9452-A3, p.2]

For gasoline vehicles, direct injection technology enables gasoline engines to achieve greater fuel efficiency and is expected to be a dominant pathway to meeting future light-duty greenhouse gas emission standards. Again emissions controls ensure that these more fuel efficient gasoline engines meet tough EPA or California criteria emission regulations. Under stoichiometric conditions, three-way catalysts are used to achieve ultra-low emissions of NO_X, HC and CO. Advanced high performance, three-way catalysts are available and will continue to evolve and be optimized to ensure that future gasoline direct injection engines will meet the toughest criteria pollutant emissions standards with minimal impacts on overall vehicle exhaust system backpressure and fuel consumption. [EPA-HQ-OAR-2010-0799-9452-A3, p.2]

Under lean combustion conditions, similar emission control technologies used on diesel vehicles can be used to reduce emissions from lean, gasoline direct injection powertrains. These include particulate filters to reduce PM emissions, and SCR and/or lean NO_X adsorber catalysts to reduce NO_X emissions. Lean NO_X adsorber catalyst performance has a high degree of sensitivity to fuel sulfur levels. The current EPA fuel sulfur limits for gasoline (30 ppm average, 80 ppm cap) are too high to allow lean NO_X adsorber catalysts to be a viable NO_X control strategy for fuel efficient, gasoline lean-burn engines that employ direct fuel injection technology. MECA believes that EPA should lower gasoline fuel sulfur limits to a 10 ppm national average to allow

NO_X adsorber catalysts to be used on such vehicles in the future in order to provide additional options for improving the efficiency and reducing greenhouse gas emissions from gasoline vehicles. [EPA-HQ-OAR-2010-0799-9452-A3, p.3]

Organization: Volkswagen Group of America

In order to consider the technical feasibility of the proposed standards, EPA evaluated a broad range of technologies which an OEM could incorporate to help achieve compliance. Over the past several years, Volkswagen held technical meetings with agency staff and provided confidential technical details illustrating our projections for future technology:

- Cost

- Readiness

- Effectiveness

- Market Adoption

- Penetration [EPA-HQ-OAR-2010-0799-9569-A1, p. 12]

During the discussions, Volkswagen focused on several key technologies including:

- Hybrid and fully electrified vehicles

- Vehicle lightweighting

- Advanced internal combustion engines (ICE) [EPA-HQ-OAR-2010-0799-9569-A1, p. 12]

Volkswagen provided EPA and NHTSA with confidential future forecasts for technology readiness, cost, and practicability. We appreciated the opportunity to present our positions and were able to engage in technical dialogue to point out areas which were or were not consistent with the agencies understandings. Certain key technologies including electrification, lightweighting, and advanced engine technologies presented areas where there were some inconsistencies. [EPA-HQ-OAR-2010-0799-9569-A1, p. 13]

Response:

Regarding comments from the Alliance of Automobile Manufacturers, we also anticipate many breakthroughs and improvements in the area of energy management, transmissions, and lightweight materials. As discussed in TSD 3, the agencies considered technologies in many categories that manufacturers could use to improve the fuel economy and reduce CO_2 emissions of their vehicles during the MYs 2017-2025 timeframe, including technologies which may not currently be in production, but are under development and are expected to be in production in the next five to ten years. Over the next decade, it is possible that there will be advances in vehicle technology that are not discussed in this assessment. For more details, please refer to the Joint

TSD Section 3.3.3.9 regarding energy management and storage, Section 3.3.2 regarding transmission technologies, and Section 3.3.5.5 regarding mass reduction. We also agree that advanced combustion technologies need to be evaluated for compliance as they are developed.

Regarding comments from BMW, we do not disagree that BMW's costs are likely to be higher than the average. In fact, our analysis shows a 2025MY cost of $1910 for BMW, or $74 higher than the average[23]. Our analysis also shows a 9% full EV penetration rate for BMW, versus the average penetration rate of 3%. This does not mean that BMW is required to use such technologies, and we thus disagree with that portion of BMW's comment ("This appears to be a double penalty because in order to comply with the proposed standards, those manufacturers must invest in expensive technologies and then force their higher fleet penetration "). Our analysis seeks only to demonstrate a possible path toward compliance. It does not seek to demonstrate *the* path. BMW correctly points out that many of the technologies we expect will allow for compliance are already currently used in BMW vehicles. However, while those technologies are used in part for fuel efficiency, they are largely tuned to provide high power in relation to the weights of their vehicles (i.e., high power-to-weight ratios. Though the agencies do not model such options, and have included the costs of preserving all vehicle utilities found in the reference fleet(s), BMW has many compliance options that may prove less costly than those EPA modeled. For example, the company could implement more off-cycle credit technologies, use more mass reduction than EPA modeled, or reduce the acceleration performance of their vehicles and put the resultant efficiency gains to fuel economy. Further, we note that BMW has no high BMEP (24/27 bar) engines in their in-use US fleet today, no high efficiency gearbox, no shift optimizer, no 12V stop-start, and no mild hybrid. So there are still many technologies that BMW is not using that can be used in their future fleet.

Regarding comments from Center for Biological Diversity, we note that many of the comments regarding legal authority address EPCA and EISA and are not correct with regard to the Clean Air Act. See preamble section I.D.2 (explaining, among other things, that section 202 (a) is not technology-forcing, and even if it were, that EPA retains considerable discretion in weighing issues of technical feasibility, cost, and lead time). In any case, EPA believes that the rule is predicated on high penetration rates of advanced technologies, and many of these go beyond the technologies on which the MYs 2012-2016 standards are predicated. A primary technology upon which our MYs 2017-2025 standards rely is high BMEP turbocharged and downsized engines. These engines will operate at 24 and 27 bar BMEP, levels at which no current production gasoline engine operates. Although such engines are beyond the single-cylinder test-bench level of development, they are not in the marketplace and considerable work remains to bring them to the marketplace.[24] Another example is mild hybrid technology. There

[23] As pointed out in the MYs 2012-2016 rulemaking, one reason these costs are higher on average is that BMW has typically paid fines rather than complying with CAFE standards, and consequently is now required to make more improvements than those of its competitors which did comply with CAFE. See 75 FR at 25414.

[24] EPA notes that Volkswagen's comment (p. 17) documents obstacles facing development and deployment of high BMEP turbocharged engines beyond the BMEP levels used within our analysis in the TSD ("While Volkswagen acknowledges that high BMEP (27 – 31 BMEP) engines with cooled EGR are being researched, we caution that additional development is necessary to overcome obstacles to these types of engines. Volkswagen views these obstacles as significant – if not overcome the issues could preclude this type of engine as a viable greenhouse gas reduction technology.")

are vehicles being sold today that include mild hybrid technology but, importantly, not at the cost levels included in our analysis. So, while that technology is in the marketplace, it is a new and rapidly developing technology used in a very small percentage of MY 2012 sales. Reasonable engineering judgement was used to select the technologies that will be available in the timeframe of this rulemaking. Many of these technologies are still in the research phase and not planned to be in production for several years and will not be broadly applicable until MY2017-2025. The midterm review will be used to re-evaluate these technology assumptions and make appropriate changes in the analysis.

Regarding comments from Eaton Corporation, we appreciate your comments in support of the flexibility allowed in the rulemaking for vehicle manufacturers to meet the standards.

Regarding comments from Honeywell Transportation Systems, and Jackson, F.W., EPA believes that the issue of technology neutrality is a much more complex issue than some commenters suggest when they advocate for a “level playing field” and suggest that a level playing field is best achieved by no incentives. Given that internal combustion engines and petroleum-based fuels have dominated the U.S. light-duty vehicle market for 100 years, with massive sunk investments, there are major barriers for new vehicle technologies and fuels to be able to gain the opportunity to equitably compete on any type of level playing field. For example, consider a hypothetical new vehicle/fuel technology that could be superior to conventional technology from a consumer perspective if, and only if, the vehicles and fuels could be produced at similar economies of scale. But, it is very possible that such a hypothetical new technology would never get the opportunity to compete at equivalent economies of scale, because of the very large investments that are needed, up front, to support the research and development, parts and vehicle production facilities, and fuel infrastructure, none of which are needed for conventional technology as these investments have been made in the past. In this context, temporary regulatory incentives do not so much “pick winners and losers” (as an inefficient or unattractive technology is not going to achieve long-term market success based on temporary incentives) as to give new technologies more of an opportunity to compete with the established technologies.

Regarding comments from International Council on Clean Transportation (ICCT) on Computer aided modeling, the agencies assume the materials that manufacturers will use in their BIW to reduce mass include HSS, AHSS, aluminum and limited magnesium and these materials have all been modeled. The extent of modeling for composites is unknown. However, the use of composites in the BIW is still being researched with applications primarily only on some limited high end vehicles. The simulations are continuing to rapidly improve to the point where they are starting to be used to simultaneously optimize the material composition, shape, and thickness of every individual part, including secondary weight reductions. With respect to the diesel engine maps used by Ricardo, it is possible that the maps could be further optimized. The maps used were optimized by compliance with US tailpipe standards which are generally more stringent than diesel standards in Europe. That said, if our maps are not fully optimized, it suggests we have been conservative with respect to our effectiveness values. The EPA did not rely on diesel engine technology as a compliance pathway in our analysis, though that does not preclude their use in the real world (i.e. our modeled compliance pathway is not an indication of an agency preference for any technology). When the results become available, we welcome ICCT’s continued work with Ricardo using more optimized diesel engine maps. As for the rapid change in cost and effectiveness estimates since the 2001 NRC report, we do not agree that the changes from then to today suggest that our technology costs or effectiveness estimates are similarly high or low, respectively. In fact, our estimates have been generated through a much more rigorous process than the 2001 NRC values which we believe helps to explain why those values are so different than values of today. We stand by our effectiveness estimates as representing the best estimates available today. As for P2 HEV costs and future batteries being smaller and cheaper due to new chemistries, we intend to monitor any future changes in battery chemistries and their costs but have chosen not to make any anticipatory changes for the final analysis. Regarding failing to include torque converter removal in our costs, we disagree with this comment where we have included DCTs as part of the HEV package. Our DCT costs include removal of the torque converter (see U.S. EPA, "Light-duty Technology Cost Analysis – Report on Additional Case Studies," EPA-HQ-OAR-2009-0472-11604 and FEV, Inc., "Light-Duty Technology Cost Analysis, Report on Additional Transmission, Mild Hybrid, and Valvetrain Technology Case Studies", Contract No. EP-C-07-069, Work Assignment 3-3. November 2011). Where our packages include automatic transmissions—which is the case on towing vehicle types—we have chosen to remain conservative and assume that the torque converter will remain and therefore there is no cost reduction association with its removal. In these cases—towing vehicles—it is possible that the torque converter could be removed but the low end torque assist provided by the torque converter would have to be regained from somewhere (e.g., the engine, the electric motor), which would incur some costs on the order of the savings realized by torque converter removal. Therefore, we believe that the best approach is simply assuming that the torque converter will remain. (Incidentally, this is an example of how EPA's technology effectiveness and costing methodologies preserve all utilities found in the current fleet.) Lastly, as regards our purported failure to assume smaller engines on P2 HEVs, we point out that we have actually assumed downsized engines (with turbocharging) on our towing P2 HEVs. We have not assumed downsized engines on our non-towing, Atkinson engine equipped P2 HEVs and have done this to ensure maintenance of vehicle utility. We discuss both of these points in our final RIA Chapter 1.3. Reasonable engineering judgement was used to select the technologies that will be available in the timeframe of this rulemaking. Many of these technologies are still in the research phase and not planned to be in production for several years. The midterm review will used to re-evaluate these technology assumptions and make appropriate changes in the analysis.

Regarding comments from Manufacturers of Emission Controls Association (MECA), we agree that future vehicles will be able to comply with existing criteria emission standards in addition to the new GHG standards and indeed will be required to do so. The comment regarding the reduction of gasoline sulfur to enable lean-burn NOx control aftertreatment is outside the scope of this rulemaking since we are not relying on lean-burn gasoline technology to demonstrate compliance.

Regarding comments from Volkswagen Group of America, we thank you for your comments and providing this additional information. We look forward to obtaining more of this type of information to inform our future work.

12.2.1. Engine Technologies

<u>Organizations Included in this Section</u>

American Petroleum Institute (API)
Center for Biological Diversity
Eaton Corporation
EcoMotors International, Inc.
Delphi Corporation
Honeywell International, Inc.
Honeywell Transportation Systems
Hyundai America Technical Center
International Council on Clean Transportation (ICCT)
Johnson Controls, Inc.
Manufacturers of Emission Controls Association (MECA)
Marz, Loren C.
Nissan North America, Inc.
Porsche Cars North America, Inc. (PCNA)
Volkswagen Group of America

Organization: American Petroleum Institute (API)

Technology Market Penetration

EPA and NHTSA chose to exclude lean burn gasoline direct injection (GDI) engine technology in evaluating pathways towards meeting the proposed GHG and CAFE standards for MY 2017 – MY 2025 light-duty vehicles.17 We concur with this assessment. While EPA and NHTSA observe that the "…availability of ultra-low sulfur (ULS less than 15 ppm sulfur) gasoline is a key technical requirement for lean-burn GDI engines to meet EPA's Tier 2 NO_X emissions standards," we note that in regions of the world where 10 ppm sulfur in gasoline was mandated (i.e., Europe and Japan), the penetration of lean-burn GDI peaked at 2% and then declined as the real-world efficiency benefits of lean-burn GDI were found to be less than promised. A recent assessment of the automakers' technology introduction plans concluded that the opportunity for lean GDI in the US was limited to 0-3% market penetration over the next decade and that even a 10 ppm max sulfur limit in U.S. gasoline would not result in lean burn engine production as the automakers would pursue other, more cost-effective technologies for regulatory compliance.18 [EPA-HQ-OAR-2010-0799-9469-A1, p. 8]

Vehicle technology penetration estimates are unrealistic - Light-duty vehicle technologies requiring ultra-low sulfur gasoline are not cost-effective and are unlikely to be used to meet the proposed fuel economy and vehicle GHG standards. We note that in regions of the world where 10 ppm sulfur in gasoline was mandated (i.e., Europe and Japan) the penetration of lean-burn GDI peaked at 2% and then declined as the real-world efficiency benefits of lean-burn GDI were found to be less than promised. [EPA-HQ-OAR-2010-0799-9469-A2, p. 2]

17 NHTSA, Preliminary Regulatory Impact Analysis: Corporate Average Fuel Economy for MY 2017-MY 2025 Passenger Cars and Light Trucks, November 2011, p. 341, http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/2017-25_CAFE_PRIA_final.pdf [EPA-HQ-OAR-2010-0799-9469-A1, p. 8]

18 McMahon, K.B., et al, The Martec Group, Lean GDI Technology Cost and Adoption Forecast: The Impact of Ultra-Low Sulfur Gasoline Standards, Society of Automotive Engineers, Paper # 2011-01-1226, April 2011 [EPA-HQ-OAR-2010-0799-9469-A1, p. 8]

Organization: Center for Biological Diversity

Examples of technologies improperly excluded from the rulemaking include but are not limited to higher voltage stop-start/belt integrated starter generators; integrated motor assist/crank integrated starter generators; 2-mode hybrids; and power split hybrids. As stated below, providing incentive credits instead of setting standards integrating these technologies does not comply with the statute. Among the technologies the Agencies believe are insufficiently developed are fuel cell electric vehicles, HCCI, multi-air, and camless valve actuation and other advanced engines currently under development. The decision to completely ignore the impact of these highly promising technologies, all clearly far beyond the research stage and already under development, is stunning. For example, the Agencies admit both that fuel cell electric vehicles have “the potential of achieving more than twice the efficiency of conventional internal combustion engines” and that “there will be some limited introduction of FCEVs into the market place in the time frame of this rule.” But, because the Agencies “expect this introduction to be relatively small,” they have completely excluded FCEVs from their modeling analysis. This approach is clearly wrong. [EPA-HQ-OAR-2010-0799-9479-A1, p. 20]

96 NPRM, 76 Fed. Reg. 74824. Other examples can be found in the Joint Technical Assessment Report found in the docket. We also here incorporate our comments to the Notice of Intent re: 2017 and Later Mode Year Light Duty Vehicle GHG Emissions and CAFE Standards dated October 29, 2010, Docket No. NHTSA-2010-0131. [EPA-HQ-OAR-2010-0799-9479-A1, p. 20]

97 NPRM, 76 Fed. Reg. 74925. [EPA-HQ-OAR-2010-0799-9479-A1, p. 20]

98 Id. [EPA-HQ-OAR-2010-0799-9479-A1, p. 20]

99 Id. [EPA-HQ-OAR-2010-0799-9479-A1, p. 20]

Organization: Delphi Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 109-111.]

First, internal combustion engines, ICE's, both gasoline and diesel, will continue to improve and, therefore, be a major propulsion source for years to come. We as an industry and you as a government agency should be supporting efforts to improve current internal combustion engine technology. And we urge the EPA and NHTSA to take a careful look at the contributions that can be made by both gasoline and diesel engines.

As I said earlier, the best potential is with improved internal combustion engine technologies. Delphi has a strong portfolio of ICE-compatible technologies including direct injection fuel systems and advanced fuel injectors for alternative fuels, such as E-85 ethanol and compressed natural gas, variable valve lift and electric cam phasing to improve engine performance over the full engine operating range and reduce pumping losses. Multi-strike emissions systems to improve advanced high dilution combustion schemes, fuel delivery modules with brushless fuel pumps to reduce parasitic losses, and evaporative emissions canisters with heated purge to improve canister purge efficiencies under low conditions common with hybrid vehicles.

Organization: Eaton Corporation

Eaton believes that many of the technologies needed to achieve the proposed standards are available. Many are already in use, while others need a path into the market. Eaton has been developing engine system technologies that enable engine down-sizing and down-speeding that help deliver significant fuel economy savings while maintaining or enhancing vehicle performance. Examples of product introductions into the market in recent years include the Variable Valve Actuation systems (Active Fuel Management) and high-efficiency supercharger boosting systems. Several other related valve train and boosting systems developments are under way for a range of engine configurations that will assist OEMs in meeting the proposed targets. [EPA-HQ-OAR-2010-0799-9494-A1, p. 2]

Organization: EcoMotors International, Inc.

EcoMotors is commercializing a revolutionary internal combustion engine (ICE) in southeast Michigan. The opoc engine is a game-changing, advanced technology offering affordable low emissions transportation. Across many applications and vehicle classes, the opoc engine produces fuel economy improvements superior to today's best electric hybrid vehicles at lower cost, and without the large and expensive battery packs required by those vehicles. The engine's unique opposed-piston opposed-cylinder architecture provides unparalleled benefits, including: [EPA-HQ-OAR-2010-0799-9594-A2, p. 2]

• The ability to deliver 50% or greater fuel efficiency in many applications, while reducing GHG emissions by half, with no loss in power, vehicle performance, drivability or utility;

• Low weight and a smaller profile - yielding unparalleled power density and exciting design opportunities with no loss of power or performance;

• The ability to run on a number of fuels, including gasoline, diesel and ethanol; and

• Functioning as a mechanical hybrid in a dual-module configuration, the opoc engine offers true modular displacement, enabling full power when needed, and shutting down one engine module when the power is not needed.1 [EPA-HQ-OAR-2010-0799-9594-A2, p. 2]

The opoc engine is manufactured using conventional components, manufacturing systems and processes. U.S. auto workers can manufacture the engine today within existing factories and without retraining. In addition, the opoc engine has a straightforward assembly, no cylinder heads or valve train, and 50% fewer parts than a conventional engine. The simplicity of its design reduces materials handling costs, and increases reliability. Moreover, with 50% fewer parts than a conventional engine, the opoc engine will cost about 20% less to manufacture.2 [EPA-HQ-OAR-2010-0799-9594-A2, p. 2]

Advanced ICE technologies, such as EcoMotors' lighter, more efficient and economical opoc engine, have the potential to contribute dramatically to our national goals of increased fuel economy and decreased GHG emissions from the transportation sector. Advanced ICE technology also continues to make good economic sense for the vast majority of consumers, and can be provided without the need for continuing subsidies or massive infrastructure investments. [See Figure 1 on p. 3 of Docket number EPA-HQ-OAR-2010-0799-9594-A2] [EPA-HQ-OAR-2010-0799-9594-A2, p. 2]

Thus, it remains extremely important for national policy and this rulemaking to encourage the commercialization and deployment of non-electric vehicles using advanced ICE technologies. Non-electric, but state-of-the-art vehicles must have the ability to compete in the market on a level playing field with electric vehicles (EVs), plug-in hybrid vehicles (PHEVs), and fuel cell vehicles (FCVs) and contribute to near-term GHG reductions and fuel economy improvements. The Proposed Rule must be modified to ensure that this level playing field exists. [EPA-HQ-OAR-2010-0799-9594-A2, p. 3]

EPA should therefore support a variety of pathways for reducing GHG emissions and achieving higher fuel economy in the U.S. fleet, including supporting the use of such innovative, advanced ICE technologies as mechanical hybrids, like the dual-module opoc engine. EcoMotors' opoc engine enables coupling of multiple engine modules to meet a wide range of power needs, while dramatically increasing the overall efficiency of the propulsion system. This modular displacement hybrid (MDH) system features an electrically-controlled clutch housed between two engine modules. When requirements dictate the need for both engine modules, the clutch automatically engages to deliver power from both modules to the drivetrain. When the power of the second module is not needed, the clutch automatically disengages, and the second engine module is completely deactivated. This coupling and de-coupling of the engine cylinders effectively provides on-demand functionality for the powertrain and improves fuel economy by 45%. EcoMotors' MDH system combines the best of a variable displacement engine system with a mild EV hybrid operation to provide unparalleled improvement in vehicle fuel economy. [EPA-HQ-OAR-2010-0799-9594-A2, p. 5]

The benefits of EcoMotors' opoc MDH system can be further extended when paired with an electric drive system to create a tribrid system (at low speeds only the electric motor runs). Mild hybridization (4-6 kW) provides optimal vehicle fuel economy - a 55% fuel efficiency gain -

without compromising vehicle performance, drivability and utility. [EPA-HQ-OAR-2010-0799-9594-A2, pp. 5-6]

The market will not accept expensive, underpowered vehicles. EcoMotors' opoc engine delivers the high mileage and levels of performance, comfort, drivability and utility consumers want - and as an ICE, it is technology consumers are familiar with and know how to use. The opoc engine has 50% fewer parts than a conventional engine so it is also more economical for consumers to maintain. Fewer engine parts means increased reliability and fewer expensive repair incidents. EcoMotors' disruptive engine technology offers significant improvements on several attribute fronts and will create market draw from the actual customer base. [See Figure 2 on p. 7 of Docket number EPA-HQ-OAR-2010-0799-9594-A2] [EPA-HQ-OAR-2010-0799-9594-A2, p. 6]

A smaller, lighter engine, with a higher power density than a conventional engine, EcoMotors' opoc engine also provides OEMs with substantial design freedom for meeting consumer preferences. With fewer parts, the engine also costs less to manufacture than conventional engines. Low cost and ease of manufacture will enable OEMs to produce and sell vehicles profitably and at a price consumers can afford. Additionally, the fact that the opoc engine can be manufactured within existing supply chains means that this engine, operating as a mechanical hybrid in a dual-module configuration, could have a substantial impact on GHG emissions, fuel economy and petroleum reduction today. [EPA-HQ-OAR-2010-0799-9594-A2, p. 7]

In a recent report, the Boston Consulting Group concluded that advanced ICE technologies will be the most cost-effective way to reduce CO_2 emissions on a broad scale because:

- ICE technologies cost between $70 and $140 for each percentage point reduction in CO_2 emissions; and
- Though propulsion systems based partially or entirely on electricity can achieve even greater reductions in CO_2 emissions, they do so at a higher cost: $140 to $280 per percentage point of reduction in CO_2 emissions. [EPA-HQ-OAR-2010-0799-9594-A2, p. 10]

EcoMotors' opoc engine, operating as a mechanical hybrid in a dual-module configuration, offers a cost-effective means for achieving significant reductions in emissions. As shown in the chart below, the opoc MDH engine offers the lowest GHG emissions footprint of any other propulsion system. With its high performance, low production costs, and resulting affordability for consumers, this mechanical hybrid is a logical choice for OEMs to meet emissions and fuel economy standards. [See Figure 3 on p. 11 of Docket number EPA-HQ-OAR-2010-0799-9594-A2] [EPA-HQ-OAR-2010-0799-9594-A2, p. 10]

1 EPA has long championed this engineering concept as a means of achieving extraordinary fuel economy and GHG reduction benefits. See EPA, 'Progress Report on Clean and Efficient Automotive Technologies under Development at EPA, Interim Technical Report,' EPA420-R-04-002 (January 2004), pp.20-23.

2 In contrast, successful commercialization of other emerging vehicle technologies-such as volume production of advanced batteries for electric vehicles-requires the establishment and growth of entirely new industries, with supporting infrastructure and workforce retraining.

Organization: Honeywell Transportation Systems

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 257.]

We believe and continue to demonstrate that the internal combustion engine has a lot of potential still remaining.

Particularly during the later years covered by this rulemaking, more advanced technologies are even more likely to enable compliance with the standards. The movement towards new powertrain technologies on the other hand is laudable but limited. The vast majority of the new vehicle fleet during the next decade, at least, will likely remain internal combustion engines. These are the vehicles which will contribute to the vast majority of greenhouse gas emissions reductions achieved under these requirements. As such, it is our position that regulatory rules should not favor new powertrains or specific technologies at the expense of technologies capable of achieving substantial gains in the near and midterm.

Organization: Honeywell Transportation Systems

Honeywell (formerly Garrett) was the first to develop turbochargers for the automotive sector fifty years ago when it supplied Caterpillar's first turbo engine. Honeywell has been the leader and principal innovator of turbo technology ever since. In the 1990s, Honeywell redefined the commercial market when it introduced Variable Nozzle Turbine technologies into turbochargers, which enabled vehicle manufacturers to fully deploy the torque and fuel economy advantages of direct injection diesel engines. Today, Honeywell supplies turbochargers for all sized automotive engines from small compact vehicle engines to some of the largest commercial vehicle engines and on diesel, gasoline and even hybrid vehicles. [EPA-HQ-OAR-2010-0799-9474-A1, p.2]

Honeywell works closely with OEMs in accordance with design specifications to manufacture and deliver turbochargers. Turbochargers facilitate the reduction of GHG emissions by enhancing the fuel economy of the engines in which they are used. Although turbo technologies do not directly control or reduce emissions, they offer OEMs the ability to downsize engines or implement other designs that lower CO_2 output, all while maintaining or improving performance. For this reason, turbochargers are traditionally considered to be an emissions-related technology and not an emissions-control technology. [EPA-HQ-OAR-2010-0799-9474-A1, p.2]

By delivering more air to the engine, turbochargers facilitate fuel combustion, which results in a cleaner engine. Turbocharged diesel engines available in the marketplace produce 50 percent less NO_X and CO_2 emissions than conventional non-turbocharged engines. Moreover, because turbochargers capture and recycle energy produced by engines, they are able to transform more fuel energy into power. A turbocharged engine can generate up to seven times more power than a naturally-aspirated (i.e., non-turbocharged) engine of equivalent displacement. As a result, OEMs using turbocharger technology can reduce their fleet engine sizes by 30 to 40 percent. This reduction in engine size in turn yields significant fuel cost advantages over naturally-aspirated engines. [EPA-HQ-OAR-2010-0799-9474-A1, p.2]

The proposed regulations account for many of the turbo advancements likely to be incorporated into the light duty fleet during the years covered by this rulemaking. Recent and upcoming advances in turbo technologies include:

1. High-Temperature Gasoline Turbocharger: Honeywell has committed substantial resources to developing materials for the turbine wheel, turbine housing and turbine end seal that allow turbochargers to function optimally and reliably under high temperature conditions. The optimum balance of performance and fuel consumption at high speeds require turbochargers to operate at turbine inlet temperatures of up to 1050 degrees Celsius.

2. Twin Scroll Turbine Technology: An emerging technology for energy boosting, this technology yields improved turbine performance by delivering high pressure exhaust pulses directly to the turbine wheel. It provides enhanced performance and fuel economy at low speeds. [EPA-HQ-OAR-2010-0799-9474-A1, p.2]

3. Electric-Actuation: Electric actuation in a turbocharger provides more accurate control for a wider range of operating conditions, while improving fuel consumption and economy, traction control, and performance levels.

4. Current Generation VNT Turbochargers: This turbo platform offered by Honeywell has spawned several high performance innovations that increase the boosting levels of previous generation VNT technology by 30%.

5. Two-Stage Turbocharging: Dual-stage turbo technology is now being applied to passenger cars, which can create substantially more torque, improve fuel consumption, and enhance vehicle acceleration.

6. Ball Bearings: Ball bearing technology dramatically reduces friction losses in the bearing system, further improves fuel consumption and transient performance, and enhances exhaust gas recirculation. Moreover, it converts more energy into aerodynamic power, which leads to better NO_X control.

7. Rotary Electric Actuator: This turbo technology provides for the electronic control of air, which yields faster response times compared to a conventional pneumatic vacuum system. [EPA-HQ-OAR-2010-0799-9474-A1, p.3]

Honeywell's concern is that providing incentives exclusively focused on electric drivetrains translates into a public policy disfavoring investment in technologies that are able to substantially advance the emissions performance of internal combustion engines. This could result in significant unrealized gains in emissions and fuel economy improvements for the model years where electric vehicles are given unique and special incentives. [EPA-HQ-OAR-2010-0799-9474-A1, p.3]

It is well recognized that the success of electric drivetrains is uncertain and will depend on the growth of infrastructure in the face of public and private budgetary constraints, technological breakthroughs to make battery costs commercially viable, and consumer confidence in EV range and safety. For example, the Boston Consulting Group projects that EVs and PHEVs could make up only 2 percent of new light-duty vehicle sales in 2020. See The Boston Consulting Group, Powering Autos to 2020: The Era of the Electric Car? at 18 (July 2011). Similarly, a recent survey by Deloitte revealed significant differences between “electric vehicle realities versus consumer expectations.” Deloitte concluded that its “study suggests that only a small niche of today’s consumers would find current technology acceptable, and that small fraction of consumers will not result in mass adoption of pure electric vehicle technology over the next decade.” See Deloitte Touche Tohmatsu Limited Global Manufacturing Industry Group, Unplugged: Electric vehicle realities versus consumer expectations at 20 (2011). [EPA-HQ-OAR-2010-0799-9474-A1, pp.3-4]

The suggested incentive, moreover, would not give credits for technology that has already been taken into consideration. The proposed standards incorporate the technology application, including the advanced turbo technologies, that the agencies believe will be cost-effective and likely measures toward compliance. This high performance credit would be an additional incentive that would encourage yet further technology deployment to achieve performance significantly beyond the footprint based target on the applicable curve. [EPA-HQ-OAR-2010-0799-9474-A1, p.5]

Honeywell encourages the agencies to adopt an incentive for high-performing ICE vehicles in order to ensure that investment in the most prevalent vehicles in the fleet continues and that these vehicles reach their full emissions improvement potential. [EPA-HQ-OAR-2010-0799-9474-A1, p.6]

---

4 Honeywell is developing start/stop turbo technology to meet the needs of the small and micro car segments. This technology can offer as much as 25 percent improved fuel economy over alternative diesel engines. While micro-turbos are more prevalent in emerging markets for new motor vehicles, with appropriate incentives micro-turbo technology can permeate through the United States fleet. Honeywell therefore endorses the agencies’ proposal to provide an off-cycle credit for start/stop and other off-cycle technologies. [EPA-HQ-OAR-2010-0799-9474-A1, p.5]

Organization: Hyundai America Technical Center

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 23.]

Some OEMs plan to focus on fuel efficiency leadership with gasoline vehicles.

Organization: Johnson Controls, Inc.

Retrofit of vehicles in the car pare with fuel saving Start-Stop technologies can reduce the country's dependence on foreign oil and reduce greenhouse gas emissions. The existing U.S. car parc exceeds 270 million vehicles and the average age of a vehicle on the road is over 10.5 years old. Retrofitting existing vehicles on the road to provide modest improvements in fuel economy could have a greater impact on reducing petroleum usage and greenhouse gas emissions than dramatic increases in fuel economy of new vehicles. Increasing new vehicle fuel economy is absolutely necessary for the longterm. However, improving the fuel economy of existing vehicles in the car parc can accelerate the reduction of petroleum usage and greenhouse gas emissions. Johnson Controls has calculated that over 400 million barrels of oil can be saved over the next 10 years if a systematic process for retrofitting existing vehicles with Start-Stop battery technology to improve fuel efficiency by 5%. This calculation assumes a retrofitting program that would convert 50% of the existing car parc by 2022. A more aggressive approach would yield bigger savings. To accomplish this, retrofit companies will need enablers such as a simplified emissions certification process. Such processes already exist for certification of some existing retrofit technologies. However, type approvals or bundling of solutions to reduce test load and certifications cost would greatly improve the ability of Start-Stop technologies to enter the market and keep costs affordable, thus supporting mass adoption. Clearer provisions are needed for ensuring that OEM warranties and. emissions components warranties are honored With the exception of any components that may be directly affected by the retrofit technology. Johnson Controls suggests that OEMs may be favorable to these provisions if, in return, they receive CAFE and/or CO_2 credits for their vehicles which are retrofitted with fuel economy technologies. [NHTSA-2010-0131-0253-A1, pp. 5-6]

Organization: Manufacturers of Emission Controls Association (MECA)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 180-183.]

Implicit in federal and state greenhouse gas emission analyses is the ability of these advanced powertrain options to meet the applicable criteria pollutant emission standards. All of these advanced light-duty powertrain options combined with the appropriately designed and optimized emission control technologies will be able to meet all current and future federal and state criteria emission requirements. In this manner, advanced emission controls for criteria pollutants enable advanced powertrains to also be viable options for reducing greenhouse gas emissions. In many cases the application and optimization of advanced emission control technologies on advanced powertrains can be achieved with minimal impacts on overall fuel consumption. Auto manufacturers will also take advantage of synergies between advanced emission control technologies and advanced powertrains to assist in their efforts to optimize their performance with respect to both greenhouse gas and criteria pollutant exhaust emissions.

For gasoline vehicles, direct injection technology enables gasoline engines to achieve fuel efficiency and is expected to be a dominant pathway to meeting future light-duty gas emission standards. Again, emission controls like secondary air injection systems and 3-way catalysts ensure that these more fuel-efficient gasoline engines meet tough EPA or California criteria emission regulations. Advanced gasoline emission controls catalysts are available and will continue to evolve and be optimized to ensure that future gasoline direct injection engines will meet the toughest criteria pollutant emission standards with minimal impacts on overall vehicle exhaust system backpressure and fuel consumption.

Under lean combustion conditions similar emission control technology used on diesel vehicles can be used to reduce emissions from lean, gas direct injection powertrains. These include the particulate filters to reduce PM emissions, SCR catalysts and/or lean NO_X adsorber catalysts known to reduce NO_X emissions. Lean NO_X adsorber catalyst performance has a high degree of sensitivity to fuel sulfur levels. The current EPA fuel sulfur limits for gasoline are too high to allow lean NO_X adsorber catalysts to be a viable NO_X control strategy for future fuel-efficient gasoline lean burn engines that employ direct fuel injection technologies. MECA believes that EPA should lower gasoline fuel sulfur limit to a 10 ppm national average and its pending Tier 3 light-duty vehicle emission standards proposal to allow NO_X adsorber catalysts to be used on such vehicles in the future in order to provide additional options for improving the efficiency and reducing greenhouse gas emissions from gasoline vehicles.

The performance of advanced emission control technologies for advanced diesel gasoline and natural gas-fueled powertrains can also be optimized to minimize nitrous oxide and methane greenhouse gas emissions from future light-duty vehicles consistent with the limits EPA set for these important greenhouse gas emissions in their initial round of light-duty vehicle greenhouse gas emission standards.

Emissions controls for gasoline and diesel engines can also be used with low carbon alternative fuels, but it's important that the specifications associated with any low carbon fuel should be compatible with the use of available exhaust emission control technology.

Organization: Nissan North America, Inc.

I. Internal Combustion Engines

Nissan is working to raise the efficiency of internal combustion engines to the ultimate level. Nissan is using three approaches in developing a range of technologies to raise engine efficiency:

More efficient combustion (higher cycle efficiency)

Lower intake and exhaust resistance (less pumping loss)

Easier rotation (lower friction) [EPA-HQ-OAR-2010-0799-9471-A1, pp.5-6]

To this end, Nissan recently announced its new generation XTRONIC CVT (Continuously Variable Transmission) for 2.0 to 3.5-liter engine vehicles. This represents an important step in Nissan's goals to improve the fuel economy and environmental performance of internal-combustion powered vehicles. The new generation XTRONIC CVT model achieves an improvement in fuel economy of up to 10%2 compared to previous CVTs for comparable vehicles. The new transmission features a world-leading ratio coverage of7.03, and friction reduced by up to 40%. Combined with Adaptive Shift Control (which adapts shifting patterns to match each driver's style and the road), the new generation XTRONIC CVT delivers responsive and powerful acceleration. These advancements, moreover, keep the engine from revving too fast at high speeds and minimize noise. The new generation XTRONIC CVT will be introduced in North America in 2012, then globally thereafter. Nissan also launched another next generation CVT last year for engines below 2.0 liters. [EPA-HQ-OAR-2010-0799-9471-A1, p.6]

In addition to drivetrain improvements, Nissan is introducing innovations such as the ECO pedal system to counteract excessive accelerator pressure and to educate drivers on their driving behaviors. Studies have shown that effective driving behavior with ECO pedal drive assist can potentially improve fuel efficiency in most driving conditions. Advanced safety technologies also contribute to reducing GHG emissions. The Predictive Forward Collision Warning System uses millimeter-wave radar to detect the deceleration of a vehicle in front of the driver and even alerts the driver in advance of a sudden drop in speed of the vehicle two cars ahead, thereby helping to avoid collisions, ensuring more consistent driving behavior and lowering overall GHG emissions resulting from even vehicle speed operation. [EPA-HQ-OAR-2010-0799-9471-A1, p.6]

Nissan has established aggressive internal goals for improving the GHG and fuel economy performance of its internal combustion fleet. Nissan's investment in electric vehicles in no way detracts from this commitment. While Nissan will promote electric vehicles and the growth of infrastructure to support it, the vast majority of Nissan's fleet will remain petroleum powered. Nissan's research and development in this area has not waned, and cannot wane given market demands, even as Nissan continues to progress vehicle technology towards zero emissions mobility. [EPA-HQ-OAR-2010-0799-9471-A1, p.6]

---

2 - According to Nissan in-house measurements using EPA's combined mode.

3 - This ratio coverage is specific to 2.0 to 2.5-liter engine vehicles.

Organization: Porsche Cars North America, Inc. (PCNA)

Diesel Technology

Many OEMs, including Porsche, plan to introduce diesel technology as a major component of their compliance strategy. The Agency's modeling assessment of potential improvements in GHG performance was built on assumptions which did not include diesels. It is not appropriate to apply a model based only on gasoline and advanced technologies across a fleet that includes significant diesel penetration. [EPA-HQ-OAR-2010-0799-9264-A1, p. 6]

Organization: Volkswagen Group of America

In the NPRM the agencies have expressed optimism in advancements in gasoline engine technology as an important pathway towards compliance with the proposed regulation. In particular, the agencies have forwarded the position that high BMEP engines coupled with cooled EGR strategies offer significant GHG reduction potential on the order of 3.5% when compared to a 24 bar downsized, turbocharged, direct injected engine. Volkswagen cautions that uncertainty remains with the viability of these high BMEP engines. This uncertainty in part is what compelled Volkswagen to suggest a more moderate stringency during the 2017-2021 phase of the regulation than the 5% average stringency proposed in the NPRM. [EPA-HQ-OAR-2010-0799-9569-A1, p. 17]

While Volkswagen acknowledges that high BMEP (27 – 31 BMEP) engines with cooled EGR are being researched, we caution that additional development is necessary to overcome obstacles to these types of engines. Volkswagen views these obstacles as significant – if not overcome the issues could preclude this type of engine as a viable greenhouse gas reduction technology. Further, Volkswagen questions the benefit potential for this type of engine technology. [EPA-HQ-OAR-2010-0799-9569-A1, p. 17]

Of particular concern is the thermal and mechanical loads imparted on the components of high BMEP concepts, requiring additional cost to improve the durability of this type of engine. In addition, a radically downsized high BMEP engine may offer benefits at peak torque but may be compromised at part load modes of operation, where low-end torque performance may be critical. It is Volkswagen's position that this type of engine may already need a two-stage charger system to address low end torque performance, adding additional cost. Considering all these factors we believe that the torque curve for future engines will be constrained over the rpm range by charging limits, exhaust temperature, peak cylinder pressures and mechanical forces that may limit the practicable increase in BMEP as shown in Figure 2-7. [See Figure 2-7 on p. 18 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 17]

Further, Volkswagen investigation indicates that while 5-6% CO_2 benefit for a high BMEP engine is possible for peak torque, the benefit at the engine speed and load range of typical two cycle testing results in a potential CO_2 benefit of approximately 2.5%. This does not indicate a high degree of additional CO_2 reduction potential for high BMEP engine concepts. [EPA-HQ-OAR-2010-0799-9569-A1, p. 18]

Response:

Regarding comments from the American Petroleum Institute (API), and MECA with respect to gasoline sulfur and spark-ignition lean-burn combustion, lean-burn combustion technology was considered in our analysis but was found to be less cost effective than other available technologies and therefore not used in our vehicle packages as shown in section 1.3 of the RIA. API's comment confirms the reasonableness of that assessment.

Regarding comments from Center for Biological Diversity, Delphi Corporation, Eaton Corporation, EcoMotors International, Inc., Growth Energy, Honeywell International, Inc., Honeywell Transportation Systems, Hyundai America Technical Center, Johnson Controls Inc., and Porsche Cars North America, Inc. (PCNA), EPA believes that the issue of technology neutrality is a much more complex issue than some commenters suggest when they advocate for a "level playing field" and suggest that a level playing field is best achieved by no incentives. Given that internal combustion engines and petroleum-based fuels have dominated the U.S.

light-duty vehicle market for 100 years, with massive sunk investments, there are major barriers for new vehicle technologies and fuels to be able to gain the opportunity to equitably compete on any type of level playing field. For example, consider a hypothetical new vehicle/fuel technology that could be superior to conventional technology from a consumer perspective if, and only if, the vehicles and fuels could be produced at similar economies of scale. But, it is very possible that such a hypothetical new technology would never get the opportunity to compete at equivalent economies of scale, because of the very large investments that are needed, up front, to support the research and development, parts and vehicle production facilities, and fuel infrastructure, none of which are needed for conventional technology as these investments have been made in the past. In this context, temporary regulatory incentives do not so much "pick winners and losers" (as an inefficient or unattractive technology is not going to achieve long-term market success based on temporary incentives) as to give new technologies more of an opportunity to compete with the established technologies.

Regarding comments from Delphi Corporation and Nissan North America, Inc., we note that our analysis of a potential compliance path for the company is consistent with its prediction that most of the improvements can come from improvements to gasoline internal combustion engines. See Tables III-28 and III-29 in the preamble to the final rule.

Regarding comments from Volkswagen Group of America, while we agree that higher BMEP engine concepts exceeding 27-bar BMEP, such as the recently announced Ricardo HyBoost project, are currently undergoing research, we limited BMEP levels to 24-bar and 27-bar for the vehicle packages used in the OMEGA modeling for the final rule since these engines are at a fairly advanced stage of research at those BMEP levels. Ricardo engineering took into consideration peak cylinder pressure limits and thermal limits such as a hard limit of 950 ºC turbine inlet temperature when working with EPA to develop the 24-27 bar BMEP engine maps used in the cycle simulation work. The high BMEP engine maps developed by Ricardo were comparable to other 24-27 bar BMEP engine maps cited from published literature (see citations 28-31 referenced in TSD 3.2.1.2.12), with comparable broad areas of high BSFC and relatively flat torque available from fairly low RPM, with >80% of peak BMEP available from 1500 – 4500 rpm. The VW comments regarding low-end torque are not consistent with the broad range of rpm, including low rpm, at which high BMEP was available for the engines cited from public literature within TSD 3.2.1.2.12. The CO_2 effectiveness used by EPA and NHTSA at 24 and 27-bar BMEP was also considerably higher than the 6% peak or 2.5% cycle efficiency cited by VW. The CO_2 cycle (not peak) effectiveness used by the Agencies ranged from approximately 16% to 24% depending on the BMEP level and combination of technologies (see TSD 3.3.1.8). The levels of effectiveness used by the agencies were also comparable to the 15 to 30% CO_2 effectiveness reported in published literature from AVL, Mahle, Ricardo and Lotus cited within the TSD. Mechanical and thermal robustness at 24-27 bar BMEP were key considerations in the cited literature from Mahle and Ricardo (citations 29 and 31 referenced in TSD 3.2.1.2.12). EPA agrees that 2-stage turbocharging may be necessary at high BMEP levels and took the cost of two-stage turbocharging into account in packages using 27-bar BMEP engines. EPA also took into account additional costs when elevating engines from 18-bar turbocharged GDI to 24-bar or 27-bar BMEP. The BMEP (or torque) curves and BSFC in the Ricardo simulation modeling and in the cited literature were representative of engines under development that are already constrained with respect to charge temperature limits, exhaust temperature limits, peak cylinder pressure and mechanical forces.

12.2.2. Transmission Technologies

No comments were received on this issue.

12.2.3. Vehicle Technologies

Organizations Included in this Section

Aluminum Association's Aluminum Transportation Group
American Chemistry Council (ACC)
Delphi Corporation
SABIC Innovative Plastics US LLC
Society of the Plastics Industry, Inc. (SPI)United Automobile Workers (UAW)
United Steel Workers (USW)
Volkswagen Group of America

Organization: Aluminum Association's Aluminum Transportation Group

Downweighting, without downsizing, has become an increasingly more important element in most comprehensive OEM vehicle efficiency improvement strategies. As automakers transition towards greater use of low weight materials, the focus is increasingly toward system cost. Aluminum is widely recognized as a cost-effective choice for reduced weight automotive components and structures. As automakers turn to greater aluminum use, secondary weight reduction is emerging as a major cost savings opportunity. Vehicle weight reduction with aluminum allows a reduction in the size, weight and cost of powertrain and chassis components (secondary weight reduction) without sacrificing performance or safety. Cost savings from secondary weight reduction can offset a majority of the cost premium associated with conversion to aluminum. This allows aluminum to compete successfully with other materials because of the advantages it brings in primary and secondary weight savings, fuel savings, structural performance and design flexibility. [NHTSA-2010-0131-0226-A1, pp. 1-2]

Since the aluminum industry provided comments on the agencies' Notice of Intent (NOI) regarding this rulemaking in October 2010, additional studies have been completed that reinforce the conclusion that downweighting with aluminum can be done both safely and economically. Simply stated, aluminum offers a safe and cost-effective way to reduce fuel consumption and reduce greenhouse gas emissions. [NHTSA-2010-0131-0226-A1, p. 2]

In this regard, we offer four new pieces of evidence: a new survey of North American automakers conducted by Ducker Worldwide, a separate and independent survey of automakers by DuPont, statements made by a high level Honda executive at the recent International Automotive Body Congress, and findings of a new report on life cycle cost analysis commissioned by the European Union, titled "Support for the Revision of Regulation (EC) No 443/2009 on CO2 Emissions from Cars." [NHTSA-2010-0131-0226-A1, p. 2]

Ducker Worldwide Survey of North American Automakers

A 2011 Ducker Worldwide Survey found that per-vehicle aluminum content will increase by 70 percent by 2025. The survey found that as lighter vehicles achieve better fuel economy with fewer emissions, aluminum is already the leading material in the engine, transmission, suspension and wheel markets, and is fast-gaining share in hoods, trunks and doors. The findings estimate that automakers will increase their use of aluminum from 327 pounds in 2009 to 550 pounds in 2025. Continued growth in overall use of aluminum reached an all-time high of 343 pounds per vehicle in 2012, up five percent from 2009. In fact, aluminum usage has increased every year for nearly 40 years (approximately seven pounds per year, per light vehicle). Market forces already in place are projected to push aluminum content to 400 pounds per vehicle in 2015/2016. The survey also confirms aluminum will play an increasingly important role in design of future safe and fuel efficient vehicles. Based on the survey and other research, the ATG believes that cars and trucks will get lighter but will not have to be made smaller or less safe. A copy of the complete Ducker Survey is attached to these comments as Attachment A [see Docket number NHTSA-2010-0131-0226-A4]. [NHTSA-2010-0131-0226-A1, p. 2]

DuPont Survey of Automakers and Suppliers

In a separate, independent survey of automakers released last year by DuPont, ‘aluminum’ was listed above all other materials by automotive engineers and executives as the “most helpful” material in meeting the new fuel economy standards (see page 7 of the DuPont survey, Attachment B [see Docket number NHTSA-2010-0131-0226-A2]). Taken together, these surveys make clear a major automotive materials shift is underway. OEM vehicle manufacturers recognize that downweighting will complement whatever other technology, design and powertrain changes are coming. Downweighting with aluminum will improve vehicle efficiency, while enabling a cost-savings from downsized powertrains, without sacrificing either safety or performance. [NHTSA-2010-0131-0226-A1, p. 2]

International Automotive Body Congress

At the recent International Automotive Body Congress held in Troy, Michigan, the senior vice president of Honda R&D Americas stated that the automaker is planning to start phasing out some steel in vehicle bodies. In a quote from a Ward’s Auto article, Frank Paluch of Honda said: “Based on our current understanding, we believe we’re approaching the practical limits of the application of high-strength steels.” Since Honda is an industry leader in the use of advanced high-strength steels in high-volume mainstream vehicles, that statement is significant. According to the same article, Mr. Paluch is among a growing number of engineers who believe it will be “increasingly difficult or impossible to meet future fuel-efficiency and carbon-dioxide emissions requirements with vehicle bodies made from steel.” [NHTSA-2010-0131-0226-A1, p. 2]

The ATG agrees with Mr. Paluch that we are fast-entering a transition stage to a more holistic vehicle design approach. That approach is premised on the greater use of lighter, stronger and more crash absorbent components utilizing low weight materials, including aluminum. These lower weight components will replace higher weight iron and steel components. And, Mr.

Paluch's statement is reflected in OEM advanced program plans and product orders from our automotive customers. [NHTSA-2010-0131-0226-A1, p. 3]

Organization: American Chemistry Council

(2) In addition to lightweighting, plastics and related materials will also contribute to fuel efficiency and emission reductions through more aerodynamic shaping and parts integration. In addition to lightweighting capabilities, thermoplastics and composites can be molded into shapes that provide superior aerodynamics. Aerodynamic drag results from the vehicle having to move air out of its way in front, and also from the turbulence created in in back as air refills the space voided by the vehicle. About 60 percent of engine power at highway cruising speed is used to overcome air resistance. As a result, improved aerodynamics translates into substantial improvements in fuel efficiency and emissions, even with vehicle size held constant. Drag coefficients (a measurement of drag forces independent of drag area or vehicle size) have improved significantly over the years, and an important element of that has been the design freedom conferred by thermoplastics and related materials. Injection-molded plastics allow for aerodynamic styling and parts integration not possible with metal or glass. Drag coefficients for present-day vehicles range between 0.30 and 0.35, but an additional 25 percent reduction in drag has been predicted in coming years.7Aerodynamic performance is generally captured in coast down testing that informs the calibration of the dynamometer. [EPA-HQ-OAR-2010-0799-9517-A2, p. 2]

(3) Lightweight plastic and plastic composite components are gaining commercial acceptance and providing lightweighting that increases fuel efficiency and reduces emissions. Plastics, plastic composites, and other materials will allow Original Equipment Manufacturers (OEMs) to move toward compliance with the Corporate Average Fuel Economy/Greenhouse Gas (CAFE/GHG) targets at a reasonable cost and independent of what power trains are chosen. Traditional vehicles will consume less gasoline or diesel; hybrids will be able to operate further on battery power, and pure electric vehicles (EVs) will enjoy a greater range, a factor critical to consumer acceptance and to their penetration of the marketplace. [EPA-HQ-OAR-2010-0799-9517-A2, pp. 2-3]

Manufacturers have already moved to the use of plastics and composites extensively in the vehicle exoskeleton and in internal components. Recent data indicate that the average vehicle already uses about 150 kg of plastics and plastics composites; that the automotive industry already uses engineered polymer composites and plastics in a wide range of applications; and that plastics are currently in use in about 50 percent of all interior automotive components, including safety subsystems and door and seat assemblies.8 [EPA-HQ-OAR-2010-0799-9517-A2, p. 3]

The Joint Technical Support Document (TSD) notes that "many manufacturers have already announced proposed future products plans reducing the weight of a vehicle body through the use of…composite body panels…"9Composites are in use by Volvo and Renault in tailgates; BMW, Peugeot and Maybach in trunk lids; and Bentley for the spare wheel/tire well.10Plastics and composites are also increasingly becoming the material of choice in applications where high performance is necessary. For example, special heat conductive plastics have been developed by

DSM for engine bay components, in which metal particles added to the plastic transfer the heat and, if needed, can also serve as electromagnetic interference (EMI) shield. Engineering plastics like DSM's polyamide grade Stanyl® keep their high level of stiffness at temperatures up to 290°C. A joint study of BMW and Mitsubishi Turbochargers demonstrated the feasibility of using plastic for the "cold" side of a turbocharger.11 [EPA-HQ-OAR-2010-0799-9517-A2, p. 3] Similarly, polycarbonate is now used extensively in lighting and selectively in rooflite glazing, and is expected to make further inroads into backlites and fixed rear windows. Polycarbonate glazing is approximately 40 percent lighter than traditional glass, and is capable of removing 25 pounds of weight reduction for a typical vehicle. Also, because it is injection molded, it can be readily combined with other materials and features, yielding parts consolidation and reducing assembly costs. These multiple advantages point to a substantial increase in the use of polycarbonate in coming years. [EPA-HQ-OAR-2010-0799-9517-A2, p. 3]

The commercialization of plastic and related components into the structure of the vehicle will also proceed during the model years covered by this rulemaking. The timeline for commercialization of structural plastics was raised at the February 25, 2011 NHTSA workshop on vehicle mass, size and safety, at which some commenters cited the relative merits and commercial promise of aluminum and high strength steel. We acknowledge that the commercial promise of structural plastics, composites and plastic/metal hybrids, is a longer-term proposition. However, it should be noted that work is well underway to understand and pursue more aggressive use of these materials. NHTSA's 2007 Report, A Safety Roadmap for Future Plastics and Composites Intensive Vehicles, extensively evaluated the potential safety benefits of Plastics and Composites Intensive Vehicles (PCIVs) to enable deployment by 2020. That document established research priorities and called for the development of test methods and timetables that allow for an orderly transition to a fleet making greater use of plastics, composites and related materials, including in the vehicle structure. [EPA-HQ-OAR-2010-0799-9517-A2, p. 3]
(4) Increasing supply and production capacity of high-tech composites and hybrid materials should be factored into agency cost estimates on an ongoing basis.

Advanced composites such as carbon fiber reinforced thermoplastics will assume a greater role in both body and structural components in the MY 2017-2025 time frame. Surveyed automotive engineers say it best: there is increasing commercial activity using existing composite technologies as well as new developments taking composites to the next level, making advanced composites the top material category poised for growth.14 Recent data suggest that the supply of plastic composite materials will continue to accelerate with an attendant decrease in costs as production processes are refined and economies of scale are realized. There is also the potential for a game-changing breakthrough that will advance commercialization, a phenomenon we have witnessed with other advanced materials.15 [EPA-HQ-OAR-2010-0799-9517-A2, p. 4]

Numerous producers have recently announced additional capacity or production for high-tech automotive plastics, composites, or constituents of high-tech composites such as carbon fiber. In March of 2011, Lanxess announced breaking ground on its first U.S.-based compounding facility for high-tech automotive plastics in Gastonia, North Carolina, with production scheduled to begin in mid-2012.16The Lanxess facility was announced to produce polyamide and polybutylene terephthalate. BMW,17 Daimler and Lamborghini18 are all involved in joint ventures with suppliers to develop and produce carbon fiber, while Oak Ridge in currently in the process of building a $35 million dollar pilot plant that will produce up to 25 tons of carbon fiber a year."19 In addition, a new joint venture between Dow and ASKA was formalized on December 20, 2011 to manufacture and globally commercialize carbon fiber.20 [EPA-HQ-OAR-2010-0799-9517-A2, p. 4]

Cost reductions are readily observable in the trade press.21 It has been reported that "carbon fiber costs have dropped ten-fold in the last decade," observing that as new production technologies become available, this "will bring the cost down further."22Benteler SGL in Germany has reported reducing cycle times from 20 to 5 minutes to enable large series production, and Styron is reported to have developed plastic resins that allow a shorter cycle time of 2 ½ minutes.23Assuming 50 weeks of production during the year and 40 hours of production during one shift in a week, this cycle time translates into 48,000 units produced a year during one shift at a plant. While such production capability will be sufficient for a large majority of the vehicle models produced (especially if two shifts are run at a given plant), multiple shifts and increased plant capacity will allow for larger production numbers. Lamborghini's Sesto Elemento concept car uses forged composites, which are predicted to be less costly than traditional carbon fiber by 'orders of magnitude.'24 Continuing cost reductions of plastic and plastic composites will quicken the pace of adoption in the commercial fleet. [EPA-HQ-OAR-2010-0799-9517-A2, p. 5]

In addition to composites, plastic/metal hybrid components are expected to become commercially significant in the structure of vehicles. A hybrid component has constituent parts from two or more materials; an example is a hollow metal pillar filled with plastic. Hybrid parts can exhibit the best aspects of both materials, for example, combining the load capacity of steel with the light weight and impact resistance of plastic. As a result, hybrid components hold promise to lower the weight of structural parts without sacrificing crashworthiness.25 [EPA-HQ-OAR-2010-0799-9517-A2, p. 5]

7 Bandivadekar et. al , Massachusetts Institute of Technology, Laboratory for Energy and Environment, "On the Road in 2035: Reducing Transportation's Petroleum Consumption and GHG Emissions (July 2008), p. 24, (available online at http://web.mit.edu/sloan-auto-lab/research/beforeh2/otr2035/)

8 See Dr. Michael Fisher, James Kolb, and Suzanne Cole, Enhancing Future Automotive Safety with Plastics (2007), available at http://www-nrd.nhtsa.dot.gov/pdf/esv/esv20/07-0451-W.pdf

9 TSD at 3.4.2.4.1, p. 3-69; 3.73.

10 Jan Willem van der Wiel, Future of Automotive Design & Materials Trends and Developments in Design and Materials, Automotive Technology Centre, http://www.acemr.eu/fileadmin/user_upload/PDF/Trendstudy_ACEMR_Designmaterials.pdf

11 Id.
12 Available at www.nhtsa.gov/DOT/NHTSA/NVS/Crashworthiness/Vehicle%20Aggressivity%20and%20Fleet%20Compatibility %20Research/810863.pdf

14 Society of Automotive Engineers, Automotive Composites, January 4, 2012, http://www.plasticsengineering.org/polymeric/node/5073

15 See, e.g., U.S. Department of Energy, Energy Efficiency and Renewable Energy, Vehicle Technologies Program, “Materials Technologies: Goals, Strategies, and Top Accomplishments,” DOE/GO-102010-3111, August 2010, http://www1.eere.energy.gov/vehiclesandfuels/pdfs/materials_tech_goals.pdf; see also, Boeing, “Coming of Age: Composites Technology in Commercial Aviation,” 2010 http://www.sampecarolinas.org/boeing.pdf (describing how advanced composites has fundamentally changed the aerospace industry)

16 http://www.gaccsouth.com/fileadmin/ahk_atlanta/Dokumente/News/Lanxess.pdf 17 See also, Tom’s Style Design & Technology, “BMW Lifts Cover From Carbon Fiber i3 Electric Car,” July 30, 2011, BMW Lifts Cover From Carbon Fiber i3 Electric Car http://www.tomsguide.com/us/BMW-i3-electric-carcarbon- fiber-passenger-shell,news-12030.html

18 See also, Autoweek, “New Techniques Cut Cost of Carbon Fiber,” July 11, 2011, http://www.autoweek.com/article/20110711/CARNEWS/110719991 (“A joint venture between Automobili Lamborghini S.p.A. and Boeing Co. has slashed the cost of carbon fiber used in a monocoque, or unibody construction, for the Sesto Elemento concept car. In effect, Lamborghini has become a carbon-fiber laboratory for its corporate parent, Volkswagen AG.”)

19 Left Lane, “Cost of Weight-Saving Carbon Fiber to Drop,” (August 1, 2011), http://www.leftlanenews.com/costof- weight-saving-carbon-fiber-to-drop.html

20 ICIS Chemical Business, “Innovation in carbon fiber processing technology could lead to a breakthrough in the cost competitiveness of the material and consequent growth in applications,” January 9, 2012, http://www.icis.com/Articles/2012/01/09/9521417/dow-carbon-fiber.html

21 Automotive News, “Suppliers are cutting the cost of carbon fiber,” August 1, 2011, http://www.autonews.com/apps/pbcs.dll/article?AID=/20110801/OEM01/308019975

22 Jan Willem van der Wiel, Future of Automotive Design & Materials Trends and Developments in Design and Materials, Automotive Technology Centre, http://www.acemr.eu/fileadmin/user_upload/PDF/Trendstudy_ACEMR_Designmaterials.pdf

23 Id.

24 See also, Autoweek, “New Techniques Cut Cost of Carbon Fiber,” July 11, 2011, http://www.autoweek.com/article/20110711/CARNEWS/110719991, quoting Paolo Feraboli, assistant professor of aerospace materials at the University of Washington and director of the Advanced Composite Structures Laboratory.

25 JEC Composites, "High-tech products for green mobility," January 30, 2012, http://www.jeccomposites.com/news/composites-news/high-tech-products-green-mobility ("Lanxess estimates that such composites can reduce component weight by another 10 percent compared to aluminum sheet hybrid designs. Nylon composite sheet hybrid technology is thus ideal for automotive lightweighting.")

Organization: SABIC Innovative Plastics US LLC

Substantial investment is being put into materials research and development. Materials such as carbon fiber, magnesium and other composites have the potential to transform vehicle design, promote safety and offer considerable emissions and fuel consumption reductions. As a global innovator in the plastics industry, SABIC-IP will continue to seek out and promote such advances. SABIC-IP will also continue to offer robust technical evaluations to assist the government and the industry advance public policy through the application of cost effective product solutions. [EPA-HQ-OAR-2010-0799-9467-A1, p.15]

Organization: Society of the Plastics Industry, Inc. (SPI)

In addition to energy management systems, the current widespread use of plastics and composites in a multitude of applications helps auto designers reduce vehicle weight and increase efficiency: [EPA-HQ-OAR-2010-0799-9492-A1, p.2]

"For auto manufacturers, plastics are seen as a great way to increase vehicle efficiency. This is because… replacing steel with plastic can cut vehicles' weight. Plastic fuel tank technologies have become the tank of choice replacing steel tanks first in Europe and Asia and now North America. This is for weight reduction as well as design flexibility, corrosion resistance and safety. Plastic fuel lines have also been advancing because they are lighter in weight, lower in cost and available in various colors for tracking under the hood. Further, combinations of plastics and steel are being developed for weight reduction but also for high load-bearing capacity and high-energy absorption for front ends and doors. Similarly, automotive glazing, including both side windows and windshields, promises great potential for plastics." [[EPA-HQ-OAR-2010-0799-9492-A1, pp.2-3]

The growing potential for plastics, composites and hybrid materials pairing plastics with metal are evident at our triennial trade show, NPE. President Obama's 2009 announcement regarding fuel efficiency came one month before NPE 2009, at which innovative companies in the plastics industry unveiled new fuel-saving technologies. Automotive applications highlighted in the sustainability theme included: component weight reducing technologies (e.g., polycarbonate-based windshields and other glazing), fast-growing application of thermoplastic elastomers, new raw material formulations, new plastic/steel hybrid structures, separator films for batteries, and applications for fuel tanks such as a high-density polyethylene formulation that is more resistant to bio-diesel fuel. Nanocomposites – in which nanoscale fillers are added to standard plastics – can add strength that results in the use of less material, and therefore helps reduce vehicle weight while maintaining performance, in applications such as fuel tanks and fuel lines. SPI recognized then as we do now that plastics and associated materials contribute to fuel efficiency, innovative design, production economy, and sustainability that will help manufacturers meet their regulatory obligations while providing exciting options to their customers. [EPA-HQ-OAR-2010-0799-9492-A1, p.3]

In coming years, we expect to see even greater adoption of plastics and composites in glazing, body panels and interior parts. PC glazing is beginning to make significant inroads into the marketplace in this country and already enjoys extensive use in Europe. There, “moulded PC is used in nearly all auto glazing functions” and gaining in areas such as the front and rear quarter windows, and fixed window sections on the sides and rear doors. Bioplastics are forecasted to expand in the automotive sector, contributing to a global demand that is expected to at least triple in the next few years. Longer term, multi-material solutions (e.g., hybrid structures) and advanced composites (e.g., carbon-fiber reinforced thermoplastic) have the potential to extend lightweighting into the body-in-white stage of vehicle production, achieving mass reduction while maintaining or enhancing the structural integrity of vehicles. From electric and hybrid cars with improved electric range, to driverless pods at airports, the automotive sector will help drive a revolution in the use of plastics. SPI is proud that NPE has been a venue of choice for manufacturers to unveil their new technologies, and we look forward to the advances to come. [EPA-HQ-OAR-2010-0799-9492-A1, p.3]

Advanced Composites are Becoming a Technologically Feasible and Economically Practicable Part of Reducing Vehicle Mass [EPA-HQ-OAR-2010-0799-9492-A1, p.5]

SPI notes that the agencies’ mid-term evaluation will allow for consideration of new and innovative technologies that could contribute to vehicle mass reduction between now and model years 2022 – 2025. We appreciate that this will enable advances with PCIVs to be considered for additional credits or incentives if appropriate. [EPA-HQ-OAR-2010-0799-9492-A1, p.5]

The Increasing Use of Advanced Composites [EPA-HQ-OAR-2010-0799-9492-A1, p.5]

Advanced composites such as carbon fiber reinforced thermoplastics (CFRP) will assume a greater role in both body and structural components in the MY 2017-2025 time frame. This is clear from the increasing investment and commercial activity surrounding such materials. These include joint ventures with carbon fiber producers announced by BMW, Daimler and Lamborghini, and both a fully electric city car and a hybrid sports car exhibited last summer which make use of CFRP to offset the weight of battery systems. Other companies are working with advanced composites, and the development of a practical composite engine block is close if not achieved, shedding pounds off the traditional counterpart. Natural fiber composites will have the additional benefits of being less sharp compared to glass fiber-reinforced composites in the event of a crash, and taking up to 60% less energy to process. [EPA-HQ-OAR-2010-0799-9492-A1, p.5]

The commercial viability of CFRP and other advanced composites will depend upon increasing supply and economies of scale. Here too, progress is visible. Oak Ridge is “in the process of building a $35 million dollar pilot plant that will produce up to 25 tons of carbon fiber a year.” A new joint venture between Dow and ASKA announced in late 2011 aims to commercialize carbon fiber globally. [EPA-HQ-OAR-2010-0799-9492-A1, p.5]

Economic Benefits of Advanced Composites [EPA-HQ-OAR-2010-0799-9492-A1, p.6]

The aforementioned throttle valve housing that is 30 percent lighter than its metal counterpart is also 50 percent lower in cost. This is not the case for every component, and there are instances of higher material costs for plastics as compared to their metal and glass counterparts. However, the Technical Document notes that both EPA and NHTSA recognize that OEMs can realize reduced costs as they gain experience and scale with new technologies, through the "the manufacturing learning curve" phenomenon. And like plastics, composites offer opportunities for parts consolidation, reducing assembly costs. [EPA-HQ-OAR-2010-0799-9492-A1, p.6]

Polycarbonate Glazing is Market Ready [EPA-HQ-OAR-2010-0799-9492-A1, p.6]

PC automotive glazing for applications such as rooflites, backlites and side windows has been available for years and holds great promise. Commercial acceptance in Europe may encourage an increasing role in this country's automotive market. Polycarbonate provides high optical clarity and shatter-resistance, and can be formulated to resist deterioration and hold up to weathering conditions. Various abrasion-resistance systems allow PC glazing to be used in rooflites, backlites, and liftgates, meeting applicable standards. PC in auto glazing applications has demonstrated weight reductions of 40-50 percent as compared to traditional glass. [EPA-HQ-OAR-2010-0799-9492-A1, p.6]

Beyond weight-reduction, injection molding of PC glazing permits design flexibility that can contribute to more aerodynamic designs and increased fuel efficiency. Current drag coefficients, ranging between 0.30 and 0.35 for a typical vehicle, are likely to improve by 25% in coming years. Integration of parts can contribute to aerodynamics and simplify assembly without compromising structural integrity. [EPA-HQ-OAR-2010-0799-9492-A1, p.6]

Organization: United Automobile Workers (UAW)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 23.]

This includes an exciting advance such as 8-, 9-speed automatic transmission, both dual clutch and conventional, and engines that feature advanced valve timing and gasoline direct injection, downsized and turbocharged engines, and vehicles that are considerably lighter than the previous generations but retain the same size. Technology such as start/stop systems and electric-powered steering are also making a contribution to vehicle efficiency.

Organization: United Steel Workers (USW)

USW believes advanced high-strength steel (AHSS) vehicle technologies will assist carmakers in achieving significant reductions in both vehicle emissions and fuel consumption. [EPA-HQ-OAR-2010-0799-9580-A2, p.2]

New steels and automotive manufacturing techniques continue to be developed by the domestic steel industry and will enable significant increases in mass reduction, crashworthiness and fuel economy, while enabling reductions in total greenhouse gas emissions, during the period specified in the NPRM. [EPA-HQ-OAR-2010-0799-9580-A2, p.3]

Organization: Volkswagen Group of America

Volkswagen provided technical descriptions and estimates to the agencies regarding vehicle lightweight technology potential and cost. Volkswagen remains amongst the industry leaders in applying high technology, lightweight designs within both premium and economy vehicles. [EPA-HQ-OAR-2010-0799-9569-A1, p. 15]

To start, Volkswagen agrees with the agencies that there is a variation in the overall mass reduction potential based on the type and market segment of vehicles. Smaller cars and economy models have less potential for mass reduction than larger or more premium vehicles. Volkswagen projects full vehicle weight reductions during the time period of this regulation on average in the order of 7-10%. The NPRM predicts for large cars and some trucks upwards of 20% mass reduction potential. Volkswagen feels that this may exceed cost effective limits. With regards to electrified vehicles, Volkswagen does agree with statements in Section 3.4.5.5 of the TSD that electrical component may increase baseline vehicle mass by upwards of approximately 4-5% depending on battery pack capacity and/or other electric drive components. [EPA-HQ-OAR-2010-0799-9569-A1, p. 15]

The NPRM includes a revised cost model as described in Section 3.4.5.5 of the TSD which now properly reflects the fact that increasing levels of mass reduction results in exponentially increasing costs. Figure 2-5 illustrates the cost function for both a 3000lb and 4000lb car. Volkswagen generally agrees with the cost being represented by an exponential function. However the function remains too conservative in its overall estimate of total price increase, i.e. the curve is too 'shallow'. Volkswagen maintains that above 10%, costs accelerate at a faster rate making reductions beyond this level less economically practical. [See Figure 2-5 on p. 16 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 15]

Further, we contend that the price increase for smaller cars may actually be more severe than for larger cars or trucks. Smaller cars must meet the same safety requirements and often have fewer, more simplistic systems from which to seek weight reductions. The model included in the NPRM reflects the opposite, that larger cars may be more challenged to reduce mass. The NPRM indicates that a large truck or pick-up would have the most costly pathway for weight reduction, while a low-weight passenger car would have the least costly pathway. This in turn would indicate that a low weight passenger car could more easily further reduce weight. Volkswagen disagrees. [EPA-HQ-OAR-2010-0799-9569-A1, p. 15]

An exponential cost function is appropriate when estimating costs related to mass reduction. In many cases moving from a baseline material to a lighter alternative not only require the use of more expensive material, but can also trigger significant capital investment needed to upgrade or completely replace manufacturing infrastructure. There are periods in which a vehicle is completely redesigned and engineers will have the opportunity for a 'clean sheet' evaluation of component consolidation and material substitution. However even then, the ability to update tooling and factory systems may be limited given their longer useful life. [EPA-HQ-OAR-2010-0799-9569-A1, p. 16]

Volkswagen is also continuing to move towards a greater degree of platform sharing which will use common architecture to underpin a broad range of vehicles. An example is the recently introduced MQB (Modular Transverse) platform which will be used for Volkswagens Polo, Beetle, Golf, Scirocco, Jetta, Tiguan, Touran, Sharan, Passat and CC. In addition several other models from various Volkswagen brands will also use the platform. A concept such as MQB offers significant savings and standardization of manufacturing processes. However, designers must now account for multidimensional requirements that apply to the range of vehicles using the platform. A weight reduction technology which may be acceptable in terms of price or performance for one model may disrupt the economics or utility of another. [See Figure 2-6 on p. 16 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 16]

The materials industry continues to offer an increasing assortment of technologies from ultra-high strength steels, to alternative materials such as aluminum, magnesium, plastics, and carbon fiber. Volkswagen remains at the forefront in evaluating these materials and in some cases being first to market with exotic designs on our premium and sport vehicles. Volkswagen has had many successes in applying advanced technologies to our economy models as prices and complexity decrease, but this process is lengthy and risky. [EPA-HQ-OAR-2010-0799-9569-A1, pp. 16-17]

Volkswagen remains concerned that the price estimates used by the agencies remain low and do not fully account for the impact that incorporating weight savings may have on retail price. Further, Volkswagen is concerned that the more stringent requirements for passenger cars will necessitate more weight reduction technologies to these vehicles and will contribute to the imbalance between prices for these cars compared to trucks. Trucks on the other hand with their lower stringency and exclusive credits may not be required to incorporate the same degree of weight reduction. [EPA-HQ-OAR-2010-0799-9569-A1, p. 17]

Response:

Regarding comments from the Aluminum Association's Aluminum Transportation Group Innovative Plastics US LLC and Society of the Plastics Industry, Inc. (SPI), SABIC Innovative Plastics US LLC and Society of the Plastics Industry, Inc. (SPI), United Steep Workers, and American Chemistry Council (ACC), we agree that engineered lightweight materials are a potential path to lower CO_2 emissions for all classes of vehicles. Please refer to the Joint TSD Section 3.3.5.5 for more detail on mass reduction.

Regarding comments from the United Automobile Workers (UAW), we appreciate your comments in support of the potential for advanced transmissions to reduce the CO_2 emissions for all classes of vehicles.

Regarding comments from Volkswagen Group of America on mass reduction costs, the agencies' basis for estimated costs of mass reduction actually appears to be conservative. As shown in joint TSD section 3, the detailed studies sponsored by the agencies suggest that 20% mass reduction is likely feasible for heavier vehicles for the rulemaking period using lightweighting materials and manufacturing technologies that have already been adopted in high volume vehicles. See joint TSD pp. 3-238 to 251. The accompanying detailed cost analysis in the joint TSD indicates that the cost of reducing mass by 20% can potentially be economical. See joint TSD section 3.3.5.5. The assumptions for mass reduction costs will be examined during the mid-term evaluation.

The total amount of mass reduction used in the agencies' analysis for this rulemaking was chosen based on the agencies' documented assumptions about how much mass reduction is technologically feasible without compromising safety. Overall, technical feasibility paths for manufacturers identified in this rulemaking include a minimal mass reduction, <5%, for the majority of passenger vehicles due to safety constraints discussed in Sec II.G of the preamble. Some trucks and CUV's have up to 15% to 20% mass reduction in the projected compliance analysis which would tend to improve highway safety. As explained in preamble section II.G, and as noted by a number of commenters (e.g. DRI, CBD), removing weight from heavier vehicles should have a positive effect on vehicle safety.

As also described in detail in preamble section II.G, the agencies have carefully documented potential compliance paths which are safety neutral, and thus do not depend on significant mass reduction from vehicles weighing less than 3,106 pounds. While EPA has shown a possible compliance pathway using one set of assumptions about the use of mass reduction, there are many alternative pathways for compliance. As discussed in EPA RIA section 3.5, this rulemaking is projected to decrease vehicle mass by approximately 4% (on average) relative to the reference case. Rather than using mass reduction technology, manufacturers could choose to use, for example, additional turbo-charging and downsizing, hybridization, or any other available technology. No manufacturer is explicitly required by this regulation to reduce the mass of their vehicles. Some manufacturers may choose not to reduce mass at all. Others may choose to reduce mass by more than the levels projected here. Using the methodology discussed in Section II.G, EPA has shown a compliance pathway that is projected to produce no net additional fatalities.

12.2.4. Electrification, Fuel Cell, and Hybrid Technologies

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Fuel and Petrochemical Manufacturers (AFPM)
Delphi Corporation
Environmental Consultants of Michigan
Honeywell Transportation Systems
International Council on Clean Transportation (ICCT)
Nissan North America, Inc.
Securing America's Future Energy (SAFE)
Tesla Motors, Inc.
Toyota Motor North America
United Automobile Workers (UAW)

Volkswagen Group of America

Organization: Alliance of Automobile Manufacturers

Is the Needed Fueling Infrastructure Available to Enable PHEVs, BEVs and Fuel Cell Vehicles to Penetrate the Market at the Levels Predicted? [EPA-HQ-OAR-2010-0799-9487-A1, p.22]

President Obama has set a goal to put one million plug-in electric vehicles on U.S. roads by 2015. To meet this goal, and to achieve even more ambitious targets for post-2015 electrification, the U.S. will need to invest heavily in electric charging infrastructure. The Boston Consulting Group recently estimated that $8 billion in electric vehicle charging infrastructure would be needed by 2020 to support the growing market for plug-in hybrid electric vehicles and battery electric vehicles. In addition to cost, a variety of other electric mobility infrastructure challenges remain, including development of uniform state, federal and local standards and protocols. Last year, the Alliance and AIAM issued a paper identifying these specific barriers and proposing a series of recommendations for addressing these challenges. Hydrogen infrastructure is also needed to support the commercialization of fuel cell vehicles. [EPA-HQ-OAR-2010-0799-9487-A1, p.22]

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

AFPM believes that these projections of electrification are too high. This problem can be corrected by employing smaller values for phase-in caps. In the Draft Joint Technical Support Document EPA states that: “Ultimately, phase-in caps are determined by the agencies using engineering judgment.”12 This engineering judgment is arbitrary and capricious. It departs from reality and is calculated to support the proposed standards. It ignores the finding of the National Research Council, with no explanation as to why its assumptions differ. AFPM recommends lower values for this important parameter for the electrification technologies. The values used by EPA and NHTSA in this proposal are unreasonably high. [EPA-HQ-OAR-2010-0799-9485-A1, p.7]

Phase-in caps are used in EPA’s Optimization Model for reducing Emissions of Greenhouse gases from Automobiles (OMEGA) and in NHTSA’s Compliance and Effects Modeling System. Phase-in caps are a user input for individual technologies. For example, [EPA-HQ-OAR-2010-0799-9485-A1, p.7] [There are two figures associated with this statement, please refer to EPA-HQ-OAR-2010-0799-9485-A1, p.7]

These phase-in caps are optimistic and unrealistic. They contribute to the projected large increase in electrification. [EPA-HQ-OAR-2010-0799-9485-A1, p.7]

The phase-in caps assumptions may look reasonable and/or small to some, but 20% of millions of new cars and light-duty trucks represents millions of new electric cars and trucks. Given consumers’ historical rejection of these vehicles, AFPM is doubtful that this penetration will occur in this timeframe. [EPA-HQ-OAR-2010-0799-9485-A1, p.8]

This highlights the necessity of a good consumer choice model. The decision by EPA and NHTSA to use poor phase-in caps based on inadequate engineering judgment leads to flawed analyses. EPA and NHTSA should use a peer-reviewed consumer choice model and re-propose standards for new LDVs after MY 2016. [EPA-HQ-OAR-2010-0799-9485-A1, p.8]

AFPM believes that the use of a realistic consumer choice model and appropriate assumptions that model future behavior will lead NHTSA to promulgate lower CAFE standards based on a lower expectation of hybrids, plug-in hybrids and all electric vehicles. EPA and NHTSA should appreciate and understand the significance and implications of these projections, especially consumer acceptance barriers associated with vehicle cost, limited driving range and recharging. There is a large difference between the capability of automakers to produce vehicles with these technologies, the ability of automakers to sell these vehicles, and the creation and dissemination of the necessary recharging infrastructure. [EPA-HQ-OAR-2010-0799-9485-A1, p.8]

EISA requires NHTSA to increase CAFE standards for passenger and non-passenger automobiles "to achieve a combined fuel economy average for model year 2020 of at least 35 miles per gallon" and to achieve the maximum feasible average standard for the fleet for model years 2021-2030 (see section 102). As the discussion above on electrification shows, NHTSA's proposal is not feasible and therefore is in conflict with its statutory authorization. The use of a peer-reviewed consumer choice model and a new proposal would assist NHTSA's development of a proposal that is feasible and coincides with Congress' mandate in this area. [EPA-HQ-OAR-2010-0799-9485-A1, p.8]

---

12 - EPA, "Draft Joint Technical Support Document: Proposed Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards," EPA-420-D-11-901, November 2011, page 3-127.

Organization: Delphi Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 109-110.]

Second, vehicle electrification is shaping the future of automotive power and propulsion and will continue to do so for many years to come as more drivers look to hybrid electric vehicles and start/stop technology as a way to improve their efficiency and green vehicle choices. This market is expected to grow steadily for the foreseeable future and will be affected by global government regulations.

Organization: Environmental Consultants of Michigan

Hybrids Have Known Deficiencies Under Real World Conditions

EPA conducted a study in 2006 confirming that hybrids operate substantially differently on the road than they do during official testing. Based on a 2006 review of several independent studies EPA concluded:

o Hybrid vehicles showed a slightly greater impact of aggressive driving on fuel economy than conventional gasoline vehicles (33 percent lower fuel economy versus 29 percent lower fuel economy for a conventional vehicle).

o Hybrid vehicles tended to show greater sensitivity to air conditioning operation than conventional vehicles. The effect of air conditioning operation reduced hybrid fuel economy by 31 percent, compared to the 20 percent impact on conventional vehicle fuel economy.

o Overall, conventional gasoline vehicles averaged a cold temperature effect of about 11 percent lower fuel economy, while the impact on hybrid vehicles averaged about 32 percent lower fuel economy.

o The Cold Federal Test Procedure fuel economy with the heater/defroster on was significantly lower than that with the heater/defroster off, ranging from 5.8 percent lower fuel economy (~1 mile per gallon lower on a non-hybrid vehicle) to 18.4 percent lower fuel economy (~8 miles per gallon lower on a hybrid vehicle). Note the fuel economy tests used by EPA for the original fuel economy labels were conducted with the air conditioning, heater and defrosters all switched to the off position. [EPA-HQ-OAR-2010-0799-11760-A2, p.8]

Putting this in perspective, the 2012 gasoline powered Toyota Highlander loses about 1.3 miles per gallon (mpg) when the air conditioning is on and loses about 0.2 mpg in cold weather with the heater on based on EPA test data. The 2012 Highlander Hybrid on the other hand loses 15.2 mpg with the air conditioning is turned on and 10.1 mpg in cold weather with the heater on. Data on the Prius is shown below: [EPA-HQ-OAR-2010-0799-11760-A2, p.8]

The table below shows the recent US EPA data comparing how typical driving conditions may adversely impact a vehicle's fuel economy compared to the optimal driving conditions used in the standard EPA laboratory test cycle. Note that the hybrid electric vehicles (HEV) did substantially worse with the air conditioning turned on, during cold temperatures or utilizing typical urban acceleration rates and high speed driving. [EPA-HQ-OAR-2010-0799-11760-A2, p.9]

These differences in fuel economy equate to higher greenhouse gas emissions on the road. The excess emissions documented in the table below demonstrate that hybrids emit more greenhouse gases on the road under real world conditions than are counted in their compliance testing (a negative number means lower emissions; a positive number means higher emissions). [EPA-HQ-OAR-2010-0799-11760-A2, p.9]

Hybrids May Contain Defeat Devices

The fact that air conditioning operation causes or contributed to lower fuel economy and higher greenhouse gases one could argue that this is a “defeat device” which is expressly prohibited by statute. [EPA-HQ-OAR-2010-0799-11760-A2, p.10]

o According to the Environmental Protection Agency, a defeat device means any device, system or element of design which senses operation outside normal emission test conditions and reduces emission control effectiveness. A defeat device includes any auxiliary emission control device (AECD) that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal operation and use unless such conditions are included in the test procedure. A defeat device does not include such items that either operate only during engine starting or are necessary to protect the engine (or equipment) against damage or accident during its operation. See 40 CFR 89.107-96. An AECD is generally deemed to be a defeat device if it is determined by EPA to reduce the effectiveness of an emission control system in response to any accessory operating condition not encountered during the Federal emission test. (EPA Advisory Circular 24). In simple terms, any time a vehicle operates differently on the road than it operates during the official EPA test there is a potential that this is due to what EPA defines as a defeat device.

o A classical example is the EPA decision regarding a change in engine operating conditions when the air conditioning was turned on (A/C and the heater are turned off during official EPA testing.) In 1995 EPA forced General Motors to recall half a million Cadillac’s, GM was to pay an $11 million fine, more than $25 million to recall and retrofit the polluting vehicles, and up to $8.75 million on projects to offset emissions from these vehicles. These projects may include buying back older vehicles or purchasing new school buses that burn cleaner fuels.

o EPA determined that GM relied on a computer chip to increase the engine idle speed by about 100 revolutions per minute (RPMs) which EPA thought was excessive and beyond what was necessary to offset the additional load applied when the air conditioning or heater was turned on. [EPA-HQ-OAR-2010-0799-11760-A2, p.10]

So one must ask the question, why is hybrid electric vehicle technology not a defeat device? During the official EPA testing the HEV typically operated in battery mode for a substantial portion of the test with the engine off. During these tests, both the air conditioning and the heater are off. When either the cabin heater or the air conditioning is turned on by the customer in real world operation the engine turns on (or in the case of the models with electric air conditioners the battery discharges faster which results in the engine turning on faster) thereby increasing vehicle greenhouse gases and decreasing vehicle fuel economy. [EPA-HQ-OAR-2010-0799-11760-A2, p.11]

Conclusion

The bottom line is that EPA needs to reevaluate the costs and benefits of hybrid and all electric vehicles in its rulemaking. [EPA-HQ-OAR-2010-0799-11760-A2, p.11]

Organization: Honeywell Transportation Systems

The long term environmental benefits of electric vehicles are also unknown once the upstream emissions of generating electricity are accounted for. The emissions benefits of an electric vehicle fleet are, from a well-to-wheel perspective, highly dependent on reconstituting the nation's base energy structure to rely more exclusively on renewable energy sources and less on fossil fuels such as coal. [EPA-HQ-OAR-2010-0799-9474-A1, p.4]

This environmental uncertainty of electric vehicles needs to be viewed against the proven environmental and market benefits of enhancing internal combustion engines with innovations such as turbochargers and advanced lightweight materials.3 The lead time and financial constraints faced by OEMs require the industry to begin to choose investment now with regard to vehicles for the model years covered by the first part of this rulemaking. Encouraging investment towards electric vehicles at the expense of ICE vehicles places a heavy bet on an uncertain future while potentially diminishing the more certain gains to be had through advanced ICE technologies. The internal combustion fleet will continue to dominate for the foreseeable future, making it a logical choice for investment with the greatest promise of return. EV mandates requiring a singular investment approach suggest a solution which at best will be limited and at worst wasted given market expectations. [EPA-HQ-OAR-2010-0799-9474-A1, p.4]

---

3 Diesel vehicles with turbo technologies offer an especially beneficial approach to securing significant emissions gains. OEMs have invested heavily in developing diesel technologies for the U.S. market, and there is growing demand for diesel vehicles in the U.S. Diesels offer substantially better fuel economy over gasoline. Honeywell strongly supports any incentive that would allow the U.S. to capture and benefit from the further deployment of diesel vehicles during the model years covered by this regulation. [EPA-HQ-OAR-2010-0799-9474-A1, p.4]

Organization: International Council on Clean Transportation (ICCT)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 29.]

I also applaud federal policy in identifying the positive role of electric vehicles as critical technology to address urban and greenhouse gas pollution, fuel economy and reduced dependence on fossil fuels. Electric drive technologies are inherently clean with zero tailpipe emissions, and coupled with renewables, they are capable of zero well-to-wheel emissions and will be necessary to reach 2050 greenhouse gas targets of over 80 percent.

Organization: Nissan North America, Inc.

Nissan is also committed to hybrid technologies. Nissan has developed a modular hybrid unit for front wheel drive vehicles that can be applied to varying engine displacements. Mated to a 2.5L supercharged 4-cylinder engine, our hybrid powertrain delivers V6-like power with improved fuel economy. Mated to a small displacement 4cylinder engine (i.e. 2.0L), our hybrid powertrain will deliver the power like a 2.5L engine and offer improved fuel economy. [EPA-HQ-OAR-2010-0799-9471-A1, p.7]

The proposed standards assume a significant market penetration of both advanced ICE technology and hybrid technology. As set forth below, hybrid vehicle market penetration has only recently expanded from initial purchasers of new technology, the innovators, to the early adopters who can begin to educate and expand awareness about the new technology to a broader, national market. Thus, widespread adoption of hybrids into the pragmatic majority of consumers remains uncertain at this time. Only through a midterm review can the agencies have the requisite certainty that the standards established for GHG emissions and suggested for CAFE will in fact be technologically and economically feasible in MYs 2022-2025. [EPA-HQ-OAR-2010-0799-9471-A1, p.7]

The proposed standards also anticipate a serious influx of transformational technology to reach compliance. As the agencies made clear in the Second Supplemental Notice of Intent, '[i]n achieving the level of standards described above for the 2017-2025 program, the agencies expect automakers' use of advanced technologies to be an important element of transforming the vehicle fleet.' *See* 76 Fed. Reg. 48,758, 48,760 (Aug. 9,2011). [EPA-HQ-OAR-2010-0799-9471-A1, p.7]

Nissan has led the way: (1) in investing in battery technology for the mass market, (2) in working with the governments on every level to prepare the infrastructure, and (3) in supporting government programs to ensure the long-term viability of low and zero emission vehicles. [EPA-HQ-OAR-2010-0799-9471-A1, p.7]

Nissan began introducing the Nissan LEAF in the United States in December 2010 and has already sold more than 10,000 Nissan LEAFs in the United States and over 20,000 worldwide. The Nissan LEAF is not a niche vehicle-it is a full-service family sedan designed for range, functionality and safety. The Nissan LEAF is a Top Safety Pick by the Insurance Institute for Highway Safety and the first all-electric car to earn an overall 5 star safety rating from NHTSA. The battery contains air-cooled, stacked laminated battery cells and is located below the seats and rear foot space, keeping the center of gravity as low as possible and increasing structural rigidity compared to a conventional five-door hatchback. [EPA-HQ-OAR-2010-0799-9471-A1, p.7]

In addition to being an industry leader in EV technology and deployment, Nissan recently announced its intention to introduce a PHEV model in 2015. Nissan will introduce additional battery electric vehicles into the marketplace in the coming years. [EPA-HQ-OAR-2010-0799-9471-A1, p.8]

Nissan also recently released its Next Generation Fuel Cell Stack (2011 Model) for FCVs. Through improvements to the Membrane Electrode Assembly (MEA) and the separator flow path, which make up the structure of Fuel Cell, Nissan significantly improved the power density of Fuel Cell Stack to 2.5 times greater than its 2005 model and realized a world's best (among auto manufacturers) 2.5 kW per liter. Integrally molding the supporting frame of the MEA enabled stable, single-row lamination of the Fuel Cell, thereby significantly reducing its overall size by more than half compared to conventional models. Finally, compared with the 2005 model, both the usage of platinum and parts variation has been reduced by 25%, thereby reducing cost of the Next Generation Fuel Cell Stack to one-sixth of the 2005 model. Nissan continues to work on the development of practical applications of FCVs to realize a zero emission society. [EPA-HQ-OAR-2010-0799-9471-A1, p.8]

While Nissan has taken leadership in electric vehicles throughout the world, the widespread market adoption of the technology depends on broader industry investment and continued government support through incentive programs. With state and local governments facing budgetary constraints, economic uncertainties and potential market disruptions, the mid-term review is necessary to ensure the ability for the industry to incorporate enough advanced powertrain technology into the fleet to allow industry-wide compliance with the program in the later years. Without such a review, the standards for the later years lack the requisite certainty to assure that they will in fact be achievable. [EPA-HQ-OAR-2010-0799-9471-A1, p.8]

Organization: Securing America's Future Energy (SAFE)

Therefore, in addition to promoting the importance of improving fuel economy, which is of critical importance, especially for the short- and medium-term, SAFE is promoting the deployment of GEVs to replace petroleum powered vehicles and establish electricity as the dominant means of powering our LDV fleet in the long-term. [EPA-HQ-OAR-2010-0799-9518-A1, p. 6]

SAFE believes that electrifying the light-duty transportation system is the best way to enhance our national, economic, and environmental security in the long because:

1) Electrification allows our economy to reduce exposure to the global oil market;

2) Electrification promotes fuel diversity;

3) Electric vehicles will be powered by largely domestic fuels;

4) Electricity prices are generally more stable than oil prices;

5) Electrification has the potential to reduce carbon emissions. [EPA-HQ-OAR-2010-0799-9518-A1, p. 6]

Reduce Exposure to the Global Oil Market: As explained above, the United States dependence on the global oil market imposes substantial economic and national security costs on the nation. Using electricity to power light-duty vehicles can disconnect a portion of the fleet from the global oil market and minimize the burdens of that dependence. [EPA-HQ-OAR-2010-0799-9518-A1, p. 6]

Promotes Fuel Diversity: Petroleum is essentially the sole fuel for the nation’s cars and trucks and fuels 93 percent of our transportation system’s energy needs. This reliance exposes the entire transportation sector to the volatility endemic to the world oil market. Electricity, however, is generated by a diverse set of fuels, including coal, nuclear, natural gas, hydroelectric, wind, geothermal, solar, landfill gas, and others. An electricity-powered transportation system, therefore, is one in which an interruption of the supply of one fuel can be made up for by others, and price volatility for one fuel is dampened by stability in others—a far cry from today, when a single event on the other side of the globe can interrupt the flow of oil and dramatically increase the cost of transportation in the United States. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 6-7]

Domestic Portfolio of Fuels: While oil supplies are subject to a wide range of geopolitical risks, the fuels that we use to generate electricity are generally sourced domestically. Satisfying our transportation energy needs with these domestic fuels will not only reduce the economic risks created by highly volatile oil prices, it will significantly lower the trade deficit. [EPA-HQ-OAR-2010-0799-9518-A1, p. 7]

Reduced Price Volatility: Oil prices are highly volatile. The retail price of electricity is not. Power prices reflect a wide range of costs. Generally, the cost of fuel represents a smaller percentage of the overall cost of delivered electricity than the cost of crude oil represents as a percentage of the cost of retail gasoline. This makes retail power prices less sensitive to any volatility in fuel prices. Further, retail power prices are generally set to reflect the average cost of wholesale prices over time, promoting retail price stability. [EPA-HQ-OAR-2010-0799-9518-A1, p. 7]

Reduced Carbon Emissions: As EPA itself noted in the preamble to the proposed rule, EVs and PHEVs have the potential to transform the carbon emissions profile of the light duty sector by obtaining much or all of their power from grid electricity that could be produced from very low GHG emission feedstocks or processes, and the potential for greater transformation if at some point in the future there is comprehensive regulation of greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-9518-A1, p. 7]

Because of the role that GEVs can play in disconnecting the nation’s economy from dependence on global oil market, and the economic and national security consequences of that dependence, SAFE supports a portfolio of policies intended to facilitate their penetration of the automotive marketplace. [EPA-HQ-OAR-2010-0799-9518-A1, p. 7]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 150.]

We have been promoting plug-in vehicles for four reasons: First, the fuel that is used to power them is domestic; second is a diverse portfolio for fuels; third, the price of power is much more stable than the price of oil; and fourth, electricity has the potential to be much cleaner in the long term.

In short, electricity has the potential to address a giant set of problems for our nation that no other fuel can address. Yet, for many years, the cost of this technology is going to be more expensive.

Organization: Tesla Motors, Inc.

• EV technology is the most promising and cost-effective alternative to traditional internal combustion engines. It is available now and at price points already lower than current projections; [EPA-HQ-OAR-2010-0799-9539-A2, p. 1]

EVs are a commercially viable technology presently and are increasingly available in the current marketplace due to innovative design and the emergence of new applications for existing technologies. Lithium-ion batteries are a proven technology, currently utilized as the standard power source for consumer electronics and increasingly identified for its potential in military, aerospace and automotive applications. These batteries offer tremendous energy density, low weight, and no memory effect. Additional research into lithium-ion batteries consistently yields improvements in energy density, durability and intrinsic safety, while continuing to lower costs. [EPA-HQ-OAR-2010-0799-9539-A2, pp. 4-5]

Tesla's real world experience demonstrates an EV technology cost that is highly competitive. Again, this cost includes not only cells, but the attendant cooling, cell management and disconnect unit as well. Specifically, battery costs for production of over 2,500 Tesla Roadsters over the life of the program were in the range of $500/kWh. As the technology has improved and Tesla has gained greater efficiencies, we have been able to lower the costs for Model S and X even further to a point where battery technology is projected in the range of $350/kWh with production of at least 20,000 units/year. By the time Tesla Motors projects high volume production of Gen III platform at volumes of 100,000 to 200,000 units/year, we believe battery costs will be well south of $350kWh. These cost estimates are based not in theory, but the actual costs seen by Tesla Motors for EVs and power trains production. [EPA-HQ-OAR-2010-0799-9539-A2, p. 5]

To this end, Tesla Motors strongly believes that EVs are a compelling proposition. Not only does the Company believe that EVs are cost-effective from a manufacturing standpoint, but also from the perspective of the total cost of ownership. When consideration of the cost of gasoline, oil changes, and other routine maintenance is factored in, the cost to operate the Model S over eight years will be $30,000 less than a comparably equipped (and priced) BMW 535i. Likewise, the Tesla Gen III vehicle will cost approximately $17,000 less to operate than a Ford Fusion over that same period.[8] [EPA-HQ-OAR-2010-0799-9539-A2, p. 5]

Of course, while cost is a significant driver of EV adoption, so too is range and vehicle efficiency. Tesla continues to push forward on development in these areas as well. By way of illustrative example, if the current technology developed for Model S were installed in a Tesla Roadster, instead of 245 miles on a single charge, the Roadster would have a range in excess of 330 miles on a single charge. Improvements are not achieved solely in terms of energy density in the pack, but in several aspects of energy storage and power management. Tesla continues to push forward on EV technology and predicts even higher battery pack energy density and longer ranges as the technology continues to improve. [EPA-HQ-OAR-2010-0799-9539-A2, p. 6]

In sum, from Tesla's perspective, there is significant advancement both in the current and next generation of EVs. Both EPA and NHTSA have a long history of successfully enacting challenging standards that the industry can and does meet, from lead free gas and catalytic converters, to Tier II emission standards and the existing CAFE standards. Tesla urges both EPA and NHTSA to continue the commendable pattern of pushing industry to drive innovation in the area of fuel efficiency and GHG reduction. [EPA-HQ-OAR-2010-0799-9539-A2, p. 6]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 94.]

The benefits of EV technology are manifest: Zero emissions at point of use. Some of the prior testaments have spoken to the national security implications of reduction of foreign oil. But too little is said of the economic benefit of a transition away from the oil monopoly and transportation, notably the fact that 300 billion a year spent on foreign oil, and this represents about half of our trade deficit. It's worth imagining what that money would do if recycled in our own economy. It's also a testament -- EV technology, as it's currently being developed, is a testament to how American innovation is driving a number of positive developments in national security and economics, but also in job creation. Tesla Motors now employs just about 2,000 folks. And as we ramp up the production, we will be increasing several hundred more in this calendar year.

---

8 Assumes Fusion retails for $25,000 and gets 40mpg at $3.50/gallon over 12,000 miles per year. Tesla Gen III assumed to get 225wh/mi at $0.11/kWh and $30,000 selling price over the same mileage.

Organization: Toyota Motor North America

Fuel Cell Readiness [EPA-HQ-OAR-2010-0799-9586-A1, p.23]

For this proposed rule, the agencies considered vehicle technologies that manufacturers could use to improve the fuel economy and reduce GHGs in the 2017-2025 model year timeframe. In doing so, assumptions were made about how currently available technologies could be incorporated into vehicle product development programs to help comply with the proposed standards. The agencies classified these as 'near-term' technologies, as many are anticipated as potential compliance strategies for the 2012-2016 model year final rule. In addition, the agencies evaluated other technologies that are not projected to be in production within the next 5 to 10 years. A number of these advanced technologies are categorized as being beyond the research phase and were not considered for the purpose of evaluating the feasibility of the proposed standards because of significant uncertainty in their development and ability penetrate the fleet in large volumes. Fuel cell vehicles are one such technology, for which the NPRM states: [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

'While we expect there will be some limited introduction of FCEVs into the market place in the time frame of this rule, we expect this introduction to be relatively small, and thus FCEVs are not considered in the modeling analysis conducted for this proposal. ' [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

We are concerned that this assessment is too cursory and could be misinterpreted. There have been significant advances in fuel-cell stacks, dramatic reductions in system cost, and marked improvement in system durability and cold weather operation. In addition, manufacturers have announced vehicle introduction plans for fuel cell demonstration vehicles, beginning in 2015. Automakers have proven the viability of fuel cell vehicles. We believe the biggest remaining hurdle is refueling infrastructure. Toyota agrees with the agencies assessment that fuel cell technology is one of the key future technologies for GHG reduction. We request that the agencies' assessment of fuel cell vehicles in the final rule elaborate on the progress that has been made to date and clarify that how infrastructure remains the primary challenge toward commercialization. We also strongly encourage the agencies to support hydrogen infrastructure development, in order to ensure the timely introduction of these vehicles. [EPA-HQ-OAR-2010-0799-9586-A1, p.22]

Organization: United Automobile Workers (UAW)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 23-24.]

UAW members are also producing new technologies that may not reach large volumes for many years but represent the long-term future of the industry. That includes hybrid transmissions, electric drive components, lithium ion battery packs, and plug-in and pure electric vehicles.

Organization: Volkswagen Group of America

Volkswagen compared cost and effectiveness estimates for hybridization with those provided by EPA in both the Notice of Intent (Sept-2010) and the Joint Draft Technical Support Document (Joint TSD) which accompanied the NPRM. Volkswagen also examined HEV penetration rates projected by EPA out to 2025. [EPA-HQ-OAR-2010-0799-9569-A1, p. 13]

Accurate projections for the cost of advanced technologies, especially vehicle electrification are a challenge. Volkswagen believes that significant uncertainty will remain with regards to pricing of energy storage for many years to come. Failure to drive down costs of electric storage will directly impact the market acceptance and resulting penetration of electrified vehicles. EPA has predicted that the NPRM will force upwards of 30% HEV technology into Volkswagen's compliance fleet for 2021 with an additional 6% EV and 1% PHEV being required to achieve compliance. [EPA-HQ-OAR-2010-0799-9569-A1, p. 13]

Volkswagen is concerned that the projected 30% HEV penetration rate is unrealistic and grossly exceeds our expectations for hybrid sales rates. Volkswagen recognizes that this is only an exercise conducted by the agency to analyze potential compliance pathways. Regardless, HEV adoption by consumers remains challenging even when long-term fuel savings can be calculated to outweigh the higher upfront vehicle price. US adoption of HEV vehicles remains between 2-3% per year even in light of recent fuel price increases. [EPA-HQ-OAR-2010-0799-9569-A1, p. 13]

EPA has projected that the industry on average will increase electrified vehicles sales to approximately 7% in 2020 and 18% in 2025 1, the majority of which are hybrid vehicles. Increased adoption by consumers of hybrids and other electrics to these levels remains a critical and difficult to predict factor. Interest in HEV technologies obviously peaks during times of escalated fuel prices. However, this is often followed by receding interest as fuel prices either drop or stabilize. It is also important to note that HEV interest is often motivated by factors other than fuel savings such as access to High Occupancy Vehicles lanes, premium parking, lower property taxes, etc. Recent trends at State and local levels to eliminate some of these perks may further deteriorate interest, e.g. California expiration of HOV access for certain hybrids. [EPA-HQ-OAR-2010-0799-9569-A1, p. 13]

EPA's base assumption with the proposal is that consumers will react to long-term fuel savings, even with higher upfront costs for higher efficiency vehicles, and that the savings will motivate consumers to purchase vehicles such as hybrids. The NPRM incorporates AEO fuel price predictions as described in Section 4.2.2 of the Joint TSD. AEO predicts gasoline prices as shown in Table 2-6. AEO predicts average gasoline prices to remain essentially constant between 2012 and 2025. This means that consumers will face similar 'price at the pump' in real dollars that they see now. Regardless of short-term price swings, AEO sees no significant deviation from current pump prices. [See Table 2-6 on p. 14 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 14]

As shown in Figure 2-4, following fuel price increases in early 2000's, there was a notable uptick in customer interest of hybrid vehicles. The fuel price spikes in 2007-2008 timeframe even brought about irrational consumer behavior in which customers traded-in large trucks to purchase small cars, sometimes at considerable loss. However as fuel prices stabilized in the mid $3 per gallon range, sales in larger vehicles and pick-up trucks returned. Often customers who had moved into smaller vehicles complained about the lack in comfort and space of the smaller cars. [See Figure 2-4 on p. 14 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 14]

As shown in Figure 2-4, following fuel price increases in early 2000's, there was a notable uptick in customer interest of hybrid vehicles. The fuel price spikes in 2007-2008 timeframe even brought about irrational consumer behavior in which customers traded-in large trucks to purchase small cars, sometimes at considerable loss. However as fuel prices stabilized in the mid $3 per gallon range, sales in larger vehicles and pick-up trucks returned. Often customers who had moved into smaller vehicles complained about the lack in comfort and space of the smaller cars. [See Figure 2-4 on p. 14 of Docket number EPA-HQ-OAR-2010-0799-9569-A1] [EPA-HQ-OAR-2010-0799-9569-A1, p. 14]

Figure 2-4 illustrates some recent market trends combined with projections within the proposal. What is most notable is recovery in the truck sector following the late 2007-2009 drop off due primarily to the US recession. During this time period the industry as a whole dropped significantly from around 16 million units to 10 million units. For 2011, the truck segment has seen accelerating recovery, once again outpacing overall car sales. Large pick-ups have seen notable gains with the F150 and Silverado/Sierra once again taking the top two sales positions. [EPA-HQ-OAR-2010-0799-9569-A1, p. 15]

Hybrid penetration rates may then be challenged to move from the 2-3% range to upwards of 7% and 18% in 2021 and 2025 respectively. Especially with gains expected to be made with conventional engine technology, Volkswagen sees no significant motivation which would drive customer interest in hybridization to these extremes. [EPA-HQ-OAR-2010-0799-9569-A1, p. 15]

1 Table 3.9-4 EPA RIA

Response:

The American Fuel and Petrochemical Manufacturers (AFPM) commented that our phase-in caps for electrification are too high resulting in projections of electrification being too high. EPA's phase-in caps are presented in Table 3-130 of the joint TSD. There we show our caps for MYs 2016, 2021 and 2025 as 15%/30%/50% for HEVs, 6%/11%/15% for EVs and 5%/10%/14% for PHEVs. In the final analysis, we have lumped mild HEVs in with HEVs so that the caps limit HEVs+mild HEVs to 15%/30%/50%. We disagree that these caps are too high. We remind the commenter that the caps are only maximum limits placed on OMEGA (for each manufacturer), they are not our projections for actual technology penetrations for the fleet. AFPM suggests that we have used the purportedly high caps to support the standards, implying that the standards can only be met with penetration rates that are higher than possible (according to AFPM). In fact, we have projected a feasible compliance pathway which relies very little on electrification to the strong hybrid (P2 HEV), EV or PHEV level. As shown in preamble Tables III-26 through III-29, our control case has essentially the same strong HEV penetration as shown in the reference case (i.e. very little addition from 2017 through 2025 beyond what's already in 2016), and the combined EV/PHEV penetration is just 2%. In the case of mild HEVs, we have a much more significant penetration rate of 26% but we believe that level of penetration can be met by industry given that a sizable number of essentially the same technology is being sold today (e.g., the GM eAssist sold on the Buick LaCrosse and Regal and the Chevrolet Malibu) and the technology is less complex than the strong HEV or EV/PHEV technologies. As regards the AFPM comments on consumer choice modeling, we address such issues in section 18.1 of this Response to Comments document.

Regarding comments from Delphi Corporation, we appreciate your comments in support of the potential for hybrid electric vehicles and start/stop technology to reduce the CO_2 emissions for all classes of vehicles.

Regarding comments from the Environmental Consultants of Michigan, EPA and NHTSA acknowledge and discuss in detail the on-road fuel economy "gap" in secton 4.2.1 of the TSD. This gap not only exists for strong HEVs. It also exists for vehicles with more conventional drivetrains. Included in this section is a discussion of the gap used by the agencies for electric drivetrains (30%) and the gap for the use of liquid fuels (20%) along with a discussion of EPA 5-cycle and derived 5-cycle MPG versus 2-cycle MPG. EPA does not need to reevaluate the costs and benefits of hybrid and all electric vehicles since the in-use gap for both conventional and hybrid vehicles has been accounted for. The agencies also do not project that a significant increase in the use of strong-HEVs will be necessary to comply with the 2017-2025 GHG standards. The commenter's remarks and specific examples were primarily with regards to strong HEV's like the Toyota Highlander HEV. Our analysis shows that strong HEVs will see only a minor increase from today's levels of approximately 4% of vehicle sales to approximately 5% of vehicle sales in 2025. Our analysis projects a much larger increase in sales of mild HEVs (approximately 30% of sales). Because the operation of mild HEV applications is limited to start/stop and mild launch assist, the differences between 2-cycle and 5-cycle MPG and CO_2 emissions would be considerably less than for strong HEVs. The comments with respect to HEVs being defeat devices are completely without merit. Like other light-duty vehicles, HEVs are subject to SFTP standards and to cold CO standards, and thus are tested under high temperature conditions with AC active (SC03 test cycle), under very aggressive driving conditions (US06 test cycle) and under cold winter conditions (Cold CO test). CO_2 emissions of more conventional vehicles also show differences during cold temperature, high temperature/AC and aggressive driving conditions, which can be seen in the differences between 2-cycle and 5-cycle CO_2 and MPG results for these vehicles.

Regarding comments from Honeywell Transportation Systems, we thank you for your comments and providing this additional information. We look forward to obtaining more of this type of information to inform our future work.

Regarding comments from the International Council on Clean Transportation (ICCT), and the United Automobile Workers (UAW), we appreciate your comments in support of the potential for electric vehicle technology to reduce the CO_2 emissions for all classes of vehicles.

Regarding comments from Nissan North America and Toyota Motor North America, Inc., we appreciate your comments in support of the potential for electric vehicle technology to reduce the CO_2 emissions for all classes of vehicles along with your efforts to introduce fuel cell vehicles. We agree the mid-term review will be used to evaluate the progress of the technologies used to meet the standards.

Regarding comments from Securing America's Future Energy (SAFE), and Tesla Motors, Inc., we appreciate your comments in support of the potential for electric vehicle technology to reduce the CO_2 emissions for all classes of vehicles while simultaneously decreasing our dependence on unstable sources of petroleum and increasing our energy security.

Volkswagen Group of America commented that our electrification penetration rates for VW in MY2021 were overly aggressive. In the proposal, we estimated VW's penetration rates at 30% HEV, 6% EV and 1% PHEV. In our final analysis, we estimate VW at 15%/0%/0% penetration of HEV/EV/PHEV in the MY2021 reference case and 1%/6%/0% penetration of HEV/EV/PHEV in the MY2021 control case along with a 29% penetration of mild HEVs. Therefore, we are actually projecting a significant decrease in HEV penetration and an increase of both mild HEVs and EVs compared to the analysis presented at proposal. We do not believe this projected compliance pathway poses the issues of consumer acceptance that VW posits in its comments. Moreover, and importantly, this represents one compliance pathway for VW, the pathway that we consider to be the most cost effective. VW may choose a different approach and is not constrained from doing so. . For example, VW has traditionally been a strong supporter of diesel technology. Nothing in the final rule precludes VW from using diesel technology to comply if VW believes that this is a more promising compliance pathway.

12.2.4.1. ANL Battery Model

Organizations Included in this Section

International Council on Clean Transportation (ICCT)
Tesla Motors, Inc.

Organization: International Council on Clean Transportation (ICCT)

8. Many, if not most, future Li-ion batteries will use air-cooling. Future versions of the ANL BatPac model should include an option to select either air or liquid cooling. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

8) Battery Cooling System Cost

The ANL report on the BatPac battery cost model 26 includes an Active Cooling System section and briefly explains why Water-50% glycol was selected:

'There are several choices of coolant that have been considered for cooling battery packs including air from the cabin, which may be heated or cooled, water-ethylene glycol solutions and dielectric liquids such as transformer coolants. Air is the least expensive, but it is less effective than the liquids because of its poor conductivity, the need for large flow passages and high pumping power. Dielectric liquids are expensive, but have the advantage of being compatible with terminals and other parts at electrical potential. Water-50% glycol solution is inexpensive and has good conductivity; we have selected it as the coolant for this study.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 21]

Unfortunately, the general design select for cost analysis does not allow for air cooling:

'We selected a general cell and battery design that can be adapted to all of the electric-drive batteries from micro-HEVs packs to EV packs (section 2). This design incorporates a hermetically sealed module closure. Unfortunately, the enclosure does not have sufficient surface area to be cooled effectively by air.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 21]

Section 5.2.3.3 Balance of Thermal Management System acknowledges that air cooled systems are less expensive and are more likely to be used in micro HEVs and HEV-HPs. In addition, air-cooling was studied by the authors of the BatPac report (docket item EPA-HQ-OAR-2010-0799-1078) and presented at the Electric Vehicle Symposium in 2009 and 2010.27,28 The initial cell design for those studies involved flat-wound cells. Flat-wound cells have more surface area and can be effectively cooled by air. Finally, it should be noted that the Nissan Leaf battery pack does not use liquid cooling, only a circulating fan inside a sealed battery pack. It is inappropriate to exclude air-cooling in the modeling of battery cost. [EPA-HQ-OAR-2010-0799-9512-A1, p. 22]

The ICCT strongly recommends that future versions of the BatPac model include an option to select either air or liquid cooling. [EPA-HQ-OAR-2010-0799-9512-A1, p. 22]

---

26 ANL, 2011, Modeling the Performance and Cost of Lithium-Ion Batteries for Electric-Drive Vehicles, Final Report prepared by Paul A. Nelson, Kevin G. Gallagher, Ira Bloom. and Dennis W. Dees, Argon National Laboratory, Argonne, IL' Docket EPA-HQ-OAR-2010-0799-1078

27 Nelson PA, Santini D. J' Barnes J., Factors Determining the Manufacturing Costs of Lithium-Ion Batteries for PHEVs, Electric Vehicle Symposium 24, Stavanger, Norway, May 13-16, 2009.

28 Santini D.J., Gallagher K. G., Nelson P.A., Modeling of Manufacturing Costs of Lithium-Ion Batteries for HEVs, PHEVs, and EVs, Electric Vehicle Symposium 25, Shenzhen, China, Nov. 5-9, 2010.

Organization: Tesla Motors, Inc.

The battery packs used by Tesla Motors are the result of innovative systems engineering and the Company's continual drive to forward advances in lithium-ion cell technology. Starting with the 18650 form-factor cells, Tesla takes advantage of all aspects of cell and pack design to optimize not only energy density, but structure and safety as well. For example, the 18650 cells used in Tesla vehicles and power trains allow for innovative packaging while providing an incredible level of safety not matched by any other lithium ion technology. Specifically, the unique properties of the smaller cell size enables efficient heat transfer, allow for precise charge management, improve reliability, and extend battery pack life. Tesla has also developed a unique and proprietary lithium ion chemistry engineered specifically for EVs. This chemistry has resulted in EV quality cells that have the highest energy density in the industry. [EPA-HQ-OAR-2010-0799-9539-A2, p. 5]

As noted in the NPRM, EPA and NHTSA have relied upon the battery cost model developed by Argonne National Laboratory for the Vehicle Technologies Program of the U.S. Department of Energy - Office of Energy Efficiency and Renewable Energy. Tesla understands that this model considers the vehicle application's power and energy requirements, which are two of the fundamental parameters when designing a lithium-ion battery for an HEV, PHEV, or EV. Though we appreciate the efforts of those at ANL and DOE, Tesla Motors supports a more comprehensive approach to assessing the battery cost. When calculating cost values, Tesla does not price cells alone, but factors in all the costs of the battery and attendant systems including cell management, thermal management and the disconnect unit. Tesla believes this is a more accurate method of cost calculation. [EPA-HQ-OAR-2010-0799-9539-A2, p. 5]

Response:

Regarding comments from Tesla Motors Inc, we agree that when analyzing the manufacturing costs of future HEV, PHEV and EV battery packs, all of the costs of the battery and attendant systems including cell management, thermal management and the disconnect unit should be included. That is why, in part, that EPA selected the ANL BatPaC model. EPA's cost analysis in the NPRM as described in the draft TSD included cell management, thermal management and the safety disconnect. This cost analysis was further refined for the final rule (see Chapter 3.3.3.9 of the joint TSD) and included options for selecting either:

1. Forced cabin-air cooling of the battery pack along with the necessary redesign of cell spacing to accommodate air cooling.
2. Liquid-cooling using glycol-water coolant and, in the case of PHEV applications, a dedicated lower-temperature coolant loop.

EPA selected the use of air-cooling for micro-HEV and HEV applications similar to the systems used for the Li-ion battery pack in the 2012 Hyundai Sonata HEV. EPA selected the use of liquid cooling for PHEV and EV applications similar to the cooling systems used for the GM Chevrolet Volt and the Ford Focus Electric. While the Agency acknowledges that air-cooled and passively-cooled systems may be appropriate for some EV applications, we decided that a more conservative approach was necessary to provide battery adequate pack cooling under all ambient conditions and for a broader range of vehicle applications than what is currently available.

12.3. Cost of CO_2-Reducing Technologies

Organizations Included in this Section

Aluminum Association's Aluminum Transportation Group
Center for Biological Diversity
Ceres
Delphi Corporation
Environmental Consultants of Michigan
International Council on Clean Transportation (ICCT)
National Association of Clean Air Agencies (NACAA)
Natural Resources Defense Council (NRDC)

Organization: Aluminum Association's Aluminum Transportation Group

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 226-227.]

As we think about light-weighting and advanced materials, the other question that comes up after safety is cost. Clearly strong, affordable carbon reducing materials are being used at an increasing rate to meet down-weighting objectives now and in the future. Aluminum is widely recognized as a cost-effective choice for reducing weight in automotive bodies, individual components, and vehicle structures. As auto makers turn to greater use of aluminium, secondary weight reductions are emerging as a major cost savings enabler. As we get larger and larger weight reductions, we're able to make larger and larger reductions in vehicle support systems.

Organization: Center for Biological Diversity

Moreover, the costs to manufacturers of adding technologies to increase their fuel efficiency are significantly overstated. In fact, it will be easier and far less costly to comply with any of the alternatives discussed in the NPRM than the Agencies state. The rapidity of improvements in fuel efficiency technology and the reduction in the costs of those technologies over the last decade has been startling. For example, as discussed in detail by comments submitted to this rulemaking by the International Council on Clean Transportation ("ICCT"), the National Research Counsel estimated in 2001 that turbocharging and downsizing would improve fuel economy by 5-7%, but by 2011 these technologies were estimated to improve efficiency by 12-20 percent, nearly three times the rate of improvement predicted, all due to accelerating technological advances; estimated manufacturing costs for turbocharging systems have fallen from $815 to $478 in three years; and adding 6-speed automatic transmission was estimated to cost $215 in 2011 but now is estimated to save $13.00. Similarly, the cost of light-weighting is significantly overstated. But the Agencies do not take either of these trends – rapid technological improvement and significant cost reductions – into account in their cost-benefit analysis. Indeed, instead of assuming greater cost reductions in the later years of the rulemaking, the Agencies assume larger costs in those years. These errors must be corrected. [EPA-HQ-OAR-2010-0799-9479-A1, p. 7]

Organization: Ceres

The analysis was also conservative as to assumptions regarding the costs and penetration of plug-in technologies; it focused on low cost technologies, although many predict higher penetration and decreasing costs of these technologies in 2020. Given the analysis' focus on low cost technologies, the vast majority of improvement in fuel economy was met with improvements in internal combustion engines. [EPA-HQ-OAR-2010-0799-9475-A1, p. 2]

Organization: Cuenca, M.

Transportation is critical to our quality of life and the EPA's regulation could increase the cost of a new vehicle by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-10142-A1, pp. 1-2]

Organization: Delphi Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 110.]

Finally, I recommend that the National Research Council technology cost estimates and implementation cadence data be included in the agencies' analyses and be considered a primary source of information. Industry reports and other analyses can also be used to provide even more insight and sensitivity.

Organization: Environmental Consultants of Michigan

The Agency is proposing stringent greenhouse gas standards that would fundamentally change the light duty vehicle and truck market. A look at the 2012 model year vehicles shows seven current models; three all electric vehicles, three hybrid electric vehicles and one hydrogen fuel cell powered vehicle would meet the proposed standards. [EPA-HQ-OAR-2010-0799-11760-A1, p.1]

While there is scant data on the true costs of all electric vehicles there are data on the hybrids. Hybrid electric vehicle (HEV) propulsion systems were first introduced in the United States in 1999. Since that time over 2 million HEVs have been sold. Eighty-eight percent of these HEVs were produced by Toyota and Honda. The Toyota Prius is the single largest selling hybrid representing more than half the hybrids on the road today in the United States. The Honda Civic represents 11 percent of the hybrids on the road in the United States and is the second highest selling hybrid. Both these vehicles would meet the 2025 model year proposed standards. [EPA-HQ-OAR-2010-0799-11760-A1, p.1]

According to two standard valuation guides for estimating the average trade-in value, even though the Prius and the Civic carry a substantial premium initial purchase price based on manufacturer's suggested retail price by the time they are eight years old they are actually worth less than their gasoline counterparts. The same applies to the next two highest selling hybrids the Camry and the Highlander. [EPA-HQ-OAR-2010-0799-11760-A1, p.1]

This raises the question, do hybrids really save consumers money? Even though a hybrid will save on fuel costs assuming they achieve the EPA fuel economy label value, the higher financing costs, sales tax, depreciation and insurance costs more than offset the fuel savings according to the True Cost of Ownership calculations on the Edmunds.com website. [EPA-HQ-OAR-2010-0799-11760-A1, p.3]

For every mile per gallon the fuel economy label is overstated, an extra $120 is added onto the cost of ownership. Conversely, for the Prius to achieve a true cost of ownership lower than the Camry, fuel prices would have to exceed $6.55 per gallon. For the Prius to achieve a true cost of ownership lower than the Corolla, fuel prices would have to exceed $13.01 per gallon. [EPA-HQ-OAR-2010-0799-11760-A1, p.4]

The Honda Civic Hybrid also has a higher true cost to own compared to the gasoline Civic. [EPA-HQ-OAR-2010-0799-11760-A1, p.4]

For every mile per gallon the fuel economy label is overstated, an extra $154 is added onto the cost of ownership. Conversely, for the Civic Hybrid to achieve a true cost of ownership lower than the gasoline version, fuel prices would have to exceed $8 per gallon. [EPA-HQ-OAR-2010-0799-11760-A1, p.5]

Looking at the third highest selling hybrid, the Toyota Camry versus the gasoline Camry, the cost to own the hybrid is higher. [EPA-HQ-OAR-2010-0799-11760-A1, p.5]

For every mile per gallon the fuel economy label is overstated, an extra $194 is added onto the cost of ownership. Conversely, for the Camry Hybrid to achieve a true cost of ownership lower than the gasoline version, fuel prices would have to exceed $10.83 per gallon. [EPA-HQ-OAR-2010-0799-11760-A1, p.6]

Continuing the analysis to the fourth largest selling hybrid, the Toyota Highlander, the true cost of the hybrid is higher than the gasoline hybrid. The rationale for all of these cases is the same. [EPA-HQ-OAR-2010-0799-11760-A1, p.6]

For every mile per gallon the fuel economy label is overstated, an extra $385 is added onto the cost of ownership. Conversely, for the Highlander Hybrid to achieve a true cost of ownership lower than the gasoline version, fuel prices would have to exceed $9.22 per gallon. [EPA-HQ-OAR-2010-0799-11760-A1, p.7]

The higher initial purchase price of hybrids leads to higher financing costs, higher sales taxes, higher insurance costs and because of the added weight of the battery higher registration fees. These added costs more than offset the lower fuel costs. All electric vehicles will have higher financing costs, higher sales taxes, higher insurance costs and because of the added weight of the battery higher registration fees. If the higher depreciation of hybrids is due in part to the anticipated battery replacement cost, all electric vehicles will continue this trend of rapid depreciation. [EPA-HQ-OAR-2010-0799-11760-A1, p.7]

Organization: International Council on Clean Transportation (ICCT)

2. The impact of computer-aided design is especially important for lightweight materials. None of the existing studies on lightweight material costs are adequate. The results of Lotus and FEV lightweight material studies will be far more accurate for future designs and must be used to assess weight reduction costs for the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 2]

2) Lightweight Material Costs

The cost of lightweight materials in the proposed rule is roughly twice that in the TAR. It is important to understand that computer simulations will especially impact lightweight material design. In the past, interactions between the thousands of parts on the vehicles and their impacts on safety, ride, noise, and vibration were impossible to predict. [EPA-HQ-OAR-2010-0799-9512-A1, p. 8]

Optimization of materials was a long, slow process of gradually changing a few parts at a time to avoid unanticipated problems. Secondary weight reductions were similarly difficult to achieve. The recent development of sophisticated and accurate vehicle simulations is opening up a new world. The initial use of these models was to improve safety design. The simulations are so effective that 5-star crash ratings became almost universal and NHTSA had to revise their rating criteria for the 2011 model year. The simulations are continuing to rapidly improve, to the point where they are starting to be used to simultaneously optimize the material composition, shape, and thickness of every individual part, including secondary weight reductions. [EPA-HQ-OAR-2010-0799-9512-A1, p. 9]

This shift in material design capabilities also impacts the cost to reduce vehicle weight. Previous lightweight material cost studies did not assess part interactions and secondary weight reductions. While they may have accurately reflected historical costs for lightweight materials, they all overstate the cost of future vehicle weight reduction. Studies in progress by Lotus and FEV are using highly sophisticated simulation models to optimize part materials and design. [EPA-HQ-OAR-2010-0799-9512-A1, p. 9]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 195.]

The results of Lotus and FEV lightweight material studies will be far more accurate of future designs and must be used to assess weight reduction costs for the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 9]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 196-197.]

ICCT is also paying FEV to do additional teardown cost assessments in connection with our work in Europe. These include updating the future hybrid costs, new cost assessments for advanced diesel engines, basic start/stop systems, manual transmissions and cool EGR systems. These results will be shared with EPA and NHTSA as they become available.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 29-31.]

The ICCT agrees that the best way to derive direct technology to cost estimate is to conduct real-world tear-down studies. Not only is this likely to be more accurate than supplier and manufacturer estimates, but the results are public, greatly increasing the transparency of the cost information.

In our work, as well as the work conducted by the EPA and CARB, the issue of light weighting of vehicles has proven to be one of the most exciting and fertile areas for improving fuel economy without incurring exorbitant costs or jeopardizing safety. As Mr. German stated, previous lightweight material cost studies did not assess part interactions and secondary weight reductions.

Studies in progress by Lotus and FEV are using highly sophisticated simulation models to optimize part materials and design. The results of these studies will be far more accurate for future designs and must be used to assess weight reduction for the final rule. We believe that these studies will be available for inclusion in the final rule. They are likely to show costs of lightweighting to be lower than envisioned in the proposed NPRM as well as in the final 2012 to '16 rule.

These are but two examples where we feel that the costs of the proposal are likely to be too high. And we feel fully confident that the technology benefits representative of another 13 years of development will result in costs much lower than $2,000.

Organization: National Association of Clean Air Agencies (NACAA))

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 41.]

Second, EPA projects the cost of new technology will add on average about $2,000 to the price of a vehicle.

We recognize the consumers will recoup this cost. However, if vehicles equipped with the technologies needed to meet model years 2025 emissions are introduced earlier, then the projected additional cost should be lower than $2000.

Organization: Natural Resources Defense Council (NRDC)

NHSTA should remove sensitivity analyses that test cost estimates that are inapplicable and misleading for the proposed rules timeframe of 2017 and beyond, especially the near-term cost estimates from the National Academies of Science. [EPA-HQ-OAR-2010-0799-9472-A2, p. 4]

Response:

Regarding the comment from the Aluminum Association's Aluminum Transportation Group, we too are concerned with both safety and cost, and have performed detailed analyses on both of these topics which are presented in Preamble III.D, II.G and RIA chapters 3 and 4. Regarding the comments from the Center for Biological diversity, that we have significantly overstated costs, we do not agree. We have made significant effort to make the best possible direct cost estimates. Further, we have made significant effort to include only those indirect costs that would likely change in response to new regulations. Lastly, we have incorporated manufacturer learning at rates used for years by EPA and that are typical for manufacturing-heavy industries like the auto industry. As for the comments specific to mass reduction costs, we do not disagree that we have perhaps overstated those costs. In fact, we sought to have better cost estimates ready in time for the final rule. Unfortunately, that effort was not completed in time for inclusion in the final rule and, as such, we were forced to use the same costs as were presented in the proposal. As the now final report on that light weighting cost effort shows (EPA-HQ-OAR-2010-0799 "Light Duty Vehicle Mass Reduction and Cost Analysis – Midsize Crossover Utility Vehicle", FEV, 2012), the costs used in our proposal and our final rule could be high. Importantly, we conducted a sensitivity on weight reduction costs in which the low side sensitivity included costs set to 40% below the final rule values. In this case, as in the primary analysis, OMEGA projection of the use of weight reduction technology is actually quite low (4% mass reduction technology applied in the 2025MY reference case and 8% in the control case, for a net of 4%). and is driven not by cost but by safety concerns. Given this safety analysis, having lower costs for weight reduction technologies would not produce significantly lower program costs or a different resultant standard level. Lastly, we fail to understand the comment that, "instead of assuming greater cost reductions in the later years of the rulemaking, the Agencies assume larger costs in those years." In no part of our analysis have we estimated increased unit costs for any technology. Our analysis might show higher costs for a technology in later years due to higher application rates (i.e., 10% weight reduction costs less than 15% and 20%), but 10% weight reduction (for example) in 2025 will always cost less than in 2016 in our analysis.

As for comments from Ceres, that we have focused our analysis on low cost technology and, as such, compliance is done largely via low cost technology, we must disagree. We have included a very broad list of technologies ranging from low cost to high cost, from low friction lubes to full battery electric. In our analysis, rather than focusing on low cost technologies, as suggested by the comment, we have focused on the most cost effective technologies – those technologies that provide the most attractive $/% improvement in GHG emissions. This is the most likely outcome in an efficient market and a reasonable approach to regulatory cost estimation. Lastly, our analysis should not be taken as predicting the future. Instead, our analysis seeks to show a possible path to that future. Each manufacturer is able to use its own preferred technologies – diesel, hybrid, plug-in hybrid, etc. – provided compliance can be achieved. If we have, in fact, been conservative regarding our plug-in cost estimates, then perhaps more plug-ins will be sold than our analysis suggests. Presumably, that would occur only if plug-ins provide a more cost effective solution than the technologies they replace.

Regarding the comment from M. Cuenca, we note that the NADA estimate of $5,000 is based on combining the costs of the MY 2011 CAFE rule, the MYs 2012-2016 CAFE/GHG rule, and the proposed MYs 2017-2025 rule. EPA has carefully examined the costs and benefits of this rule and has appropriately included the impacts of the MYs 2012-2016 rule in the baseline with which those costs and benefits are compared. Thus, the cost of the earlier rule is reflected in our analysis. In addition, the NADA estimate assumes that indirect costs for all technologies equal the direct costs, by using a retail price equivalent multiplier of 2.0. EPA's cost estimates take into account that indirect costs for new technologies vary with the complexity of the technology and the time frame since the technology's adoption, a more reasonable approach. This issue is discussed in detail in TSD Chapter 3.1.2.2.

In any case, that summation is not correct. For example, the MYs 2012-2016 rule estimated costs of roughly $950 (2007$) in MY 2016. However, that $950 would be considerably lower by the 2025 MY due to learning on the technologies included in that 2016 MY vehicle. Also, the MY 2011 CAFE rule used an estimate of indirect costs substantially higher than that used by EPA in the MYs 2012-2016 and 2017-2025 rules. EPA finds that it is inappropriate to use the costs (or benefits) from previous rulemakings to assess the impacts of this rule. The costs (and benefits) from previous rules are used in the reference case for this rule. In fact, Table 3.9-1 of EPA's final RIA shows that the 2025MY reference case costs for this final rule (i.e., the costs of meeting the 2016MY standards in the 2025MY) are $719 (2010$) relative to the 2008 baseline and includes the additional costs of compliance with 2009-2010 CAFE, and is still far lower than the $950 (2007$) estimated to meet the 2016MY standard in the 2016MY as estimated in the MYs 2012-2016 final rule. As a result, we would roughly estimate the cost of meeting the 2025MY standard in the 2025MY as $1836+$719=$2555 relative to a 2025MY vehicle meeting the 2008MY standard.[25] Clearly, our estimate is far less than NADA's. Finally,

[25] The $719 value actually includes costs to meet NHTSA's MY2011 standards in MY2025. To clarify, in the MYs 2012-2016 final rule, we estimated the cost to meet the MY2011 standard in MY2016 at $89 (2007$) (see

as discussed in preamble section III.H.2.a, Chapter 3.1.2 of the joint TSD and below in our response to comment 12.3.2, EPA does not agree with NADA's arguments for a markup for indirect costs that doubles direct costs.

Regarding the suggestion from Delphi that the NRC technology cost estimates and implementation cadence data be included in our analysis as the primary source of information, we have not followed that suggestion. We believe that the cost teardown work conducted by FEV for EPA and the battery pack model developed by ANL represent the most up-to-date and best information available on the costs of technologies upon which our analysis relies. This issue is discussed in the final section of RIA chapter 3. The comments from NRDC are also related to the NRC report, and their comment is addressed to NHTSA.

Regarding the comment from Environmental Consultants of Michigan, the point of the comment appears to be that hybrids have higher cost of ownership than do more traditional internal combustion engine-only vehicles. These higher costs are claimed to result from higher insurance costs, higher registration fees due to higher weights, higher financing costs and sales taxes. Without addressing the merits of the metrics provided by the commenter, we wish to point out that the MYs 2012-2016 rule and 2017-2015 rules combined include a penetration rate of strong hybrid technology of 5% and of mild hybrid technology of 26% (which were not addressed by the commenter). As can be seen from this analysis, we are not relying heavily on strong hybrid technologies in projecting potential compliance paths. Further, we would expect that, at 5% penetration, most of those hybrids will be purchased by people that want the hybrid for reasons that may well extend beyond cost of ownership considerations (i.e., image, prestige, etc.). Further, the weights of the strong hybrids in our analysis are not expected to be any higher (and most are expected to be lower) than in today's vehicles. Lastly, the commenter suggests that hybrids experience more rapid depreciation than non-hybrids due, in part, to anticipated battery replacement costs. The commenter fails to consider the *possibility* that, should the assertion be true that depreciation is more rapid on hybrids, the cause may not be due to anticipated battery replacement costs but rather the rapid and ongoing improvement of new hybrid technologies making new hybrids more attractive than used hybrids. This may well be in stark contrast to the non-hybrid case where new non-hybrids are not seen as being demonstrably better than their used counterparts. Further, our review of independent reliability data suggests that hybrid vehicles are just as reliable, if not more so, than their non-hybrid counterparts (see Chapter 5.2.2.2 of the final RIA).

Regarding the comments from ICCT, we agree that the Lotus and FEV lightweight vehicle studies that were not completed in time for inclusion in the final rule analysis provide better cost estimates than those used in the final analysis. Though this study is complete now, unfortunately, we were not able to use those estimated costs, as stated above and in TSD 3.3.5.5. We agree with all of the other comments provided by ICCT concerning the Lotus and FEV lightweight material studies. We agree with ICCT that teardown studies provide better cost estimates than do paper studies. ICCT also commented that our proposed cost estimates were

EPA-420-R-10-009, Table 4-6 at page 4-18) which would probably be on the order of $50-$70 (2010$) for meeting the MY2011 standard in MY2025. Therefore, the $2555 value stated here is slightly high since it already includes the costs of meeting the MY2011 standard in MY2025.

too high and should be much lower than $2000. In fact, our final cost estimate (without using the teardown results) is $1836, or roughly $110 lower than the cost estimate we used at proposal and lower than $2000.

Regarding the comment from the NACAA, we assume that the claim that, if vehicles equipped with the technologies needed to meet the MY 2025 emissions were introduced earlier then the additional cost should be lower than $2000 is a reference to learning effects starting earlier and resulting in lower costs by 2025. While that may be true, one cannot lose sight of the need to introduce new technologies at a sustainable and reasonable pace. Our technology phase in caps describe what we believe to be the maximum rate at which technologies might be introduced. While it's possible that some manufacturers may introduce technology faster, we believe that others may be even slower. The rate of introduction of technology is an important aspect of the fleet that we will watch very closely in the future. There are some disadvantages to introducing technologies sooner, and manufacturers may not even be capable of doing so because of supplier limitations, and product redesign cycles. We have attempted to provide the auto makers sufficient time to introduce new technologies on a pace that is consistent with our understanding of technology availability and learning.

12.3.1. Direct Manufacturing Costs

Organizations Included in this Section

Natural Resources Defense Council (NRDC)
Porsche Cars North America, Inc. (PCNA)

Organization: Natural Resources Defense Council (NRDC)

EPA should continue its current practice of conducting tear-down cost analyses. [EPA-HQ-OAR-2010-0799-9472-A2, p. 4]

Organization: Porsche Cars North America, Inc. (PCNA)

Battery Costs

Porsche believes that the agencies grossly underestimate the cost of battery technology. This error inappropriately inflates the apparent cost effectiveness of the GHG program. [EPA-HQ-OAR-2010-0799-9264-A1, p. 6]

Response:

Regarding the NRDC comment, as we move forward and identify possible future needs for further teardown work, we fully intend to do so. We believe that the teardown studies conducted in support of our GHG efforts provide the highest quality and most up-to-date cost estimates for GHG reducing technologies.

Regarding the Porsche comment, we have trouble understanding why the commenter believes we have underestimated battery costs given the lack of detail provided in the comment. We welcome Porsche to submit data publicly that supports their comments. Our battery costs are based on the ANL BatPaC model, a peer reviewed model that estimates direct manufacturing costs associated with batteries used in hybrids, plug-in hybrids and full electric vehicles. For hybrids, we have taken those direct costs as being applicable in the 2017MY, which seems appropriate assuming sales of 15 million vehicles and a 3% hybrid penetration rate (the costs we used from the ANL BatPaC model assumed 450,000 units, or 3% of 15 million). We have then applied our High 1 ICM of 1.56 to those direct costs to estimate the total costs for the batteries. Further, we apply learning effects going forward from 2017 through 2025 to arrive at our 2025MY costs. For hybrids, we have assumed that the batteries are on the flat portion of the learning curve by the 2017MY and continuing through 2025 making the 2025MY costs roughly 78% of the 2017MY costs. We believe this is reasonable given the nine years of learning and cost reduction that will undoubtedly take place between 2017 and 2025.

For plug-ins and full EVs, we have taken the BatPaC direct costs as being applicable in the 2025MY, a full 14 years from now. As such, we have applied no learning curve cost reductions to plug-in and EV batteries for our 2025MY costs. We “reverse learn” (i.e., back out learning effects to increase the costs) for years prior to 2025. Further, for plug-in and full EV batteries, we have applied our High 2 ICM of 1.77 to the direct costs to estimate the total costs. Again, we believe that these cost estimates are sound. As described in TSD 3.3.3 the BatPac model is peer reviewed.

Lastly, we have conducted several sensitivities that serve to both increase and decrease our battery pack cost estimates—battery pack costs, learning effects and ICMs—and for each of these sensitivities, we see very little impact on our overall program costs and benefits. This is largely due to the low penetration rates of battery-based technologies like strong hybrids, plug-ins and full EVs.

12.3.2. Indirect Costs

Organizations Included in this Section

International Council on Clean Transportation (ICCT)
National Automobile Dealers Association (NADA)

Organization: International Council on Clean Transportation (ICCT)

7. RPE indiscriminately spreads all indirect costs over all components, while ICMs reflect only those elements of indirect costs that would be expected to change in response to a regulatory-induced technology change. The use of RPE is not appropriate and the sensitivity analyses presented in Tables IV-88, IV-89 and IV-90 should be removed from the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

7) RPE and ICM

ICCT agrees with the use of indirect cost multipliers (ICM) instead of Retail Price Equivalent (RPE) and the general approach of assigning technologies to several complexity classes for determining the ICM value. Trying to determine the indirect multiplier for each technology would be extremely difficult and time consuming, but it is also important to use more appropriate and targeted adjustments than a single, indiscriminant RPE. [EPA-HQ-OAR-2010-0799-9512-A1, p. 19]

For this rule proposal EPA improved the original ICM factors that have been used in other regulatory assessments in two ways. First, the original ICM factors for low and medium technology complexity were updated; the updated ICM factors were developed following expert panel recommendations on newer technologies (passive aero-reduction, engine downsizing and turbocharging and 40-mile range PHEV). Second, the way ICM factors are applied was modified, '...resulting in the warranty portion of the indirect costs being applied as a multiplicative factor (thereby decreasing going forward as direct manufacturing costs decrease due to learning), and the remainder of the indirect costs being applied as an additive factor (thereby remaining constant year-over-year and not being reduced due to learning)'. In addition, the original RPE values used by EPA were increased from 1.46 to 1.5 as a way to reflect long-term average RPE values. Table 3 shows the evolution of ICM and the change to RPE values on the 2017-2025 Rule (High 2, Long term). [Table 3 can be found on p. 20 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 19]

ICMs are a better methodology for indirect cost estimation than the RPE multipliers used in previous rulemakings. The development of ICMs as a tool for indirect cost assessment has been conducted in a most rigorous way and the study results have been peer reviewed in well known scientific journals.24 The most critical distinction between ICMs and RPE is that ICMs have been developed 'to reflect only those elements of indirect costs that would be expected to change in response to a regulatory-induced technology change.' [EPA-HQ-OAR-2010-0799-9512-A1, pp. 19-20]

However, in the Sensitivity Analysis section IV (NHTSA Proposed Rule for Passenger Car and Light Truck CAFE Standards for Model Years 2017-2025, page 75307 of the Federal Register), the proposal presents two sensitivity calculations that neglect the fundamental advantages of using ICMs. The first sensitivity calculation evaluated the economic impact of technology cost on CAFE fuel economy using RPE for indirect costs for all technologies instead of ICMs (Table IV-88). The second sensitivity calculation (Table IV-89) involves cost values derived from a different source, namely the National Academy of Sciences assessment on LDV fuel economy technologies; the NAS report uses two sets of RPEs, one for non-electrification technologies and another one for electrification technologies (Hybrids and EVS).25 [EPA-HQ-OAR-2010-0799-9512-A1, p. 20]

The use of a single RPE of 1.5 for all technologies, instead of a technology based ICM, inflates the costs per vehicle by 24%, from $2023 to $2509. The second method uses a RPE of 1.5 for non-electrification technologies, which are mostly low- and medium-complexity options and comprise the bulk of the technologies to be adopted in the future; as a result the cost per vehicle is inflated by 39%. [EPA-HQ-OAR-2010-0799-9512-A1, p. 20]

The ICCT believes that the use of RPE for these two sensitivity analyses is inappropriate and distorts the cost results. The problem stems from lumping indirect costs indiscriminately, as the

RPE method does. The RPE method does not consider that new technologies will not necessarily incur additional indirect costs. RPE spreads all indirect costs over all components, while ICMs reflect only those elements of indirect costs that would be expected to change in response to a regulatory-induced technology change. For example, it is appropriate to include warranty costs in the indirect costs for new technologies, while marketing costs would not change in response to adding many incremental technologies. Unless the technology is directly marketed to consumers, it is inappropriate to spread existing marketing costs to the new technology. Many individual technologies are small in scale and should reflect only a subset of RPE costs; as a result, for low complexity technologies, the ICM should be lower than the RPE. This is not always the case, as ICM estimates for particularly complex technologies, specifically hybrid technologies (for near term ICMs), and plug-in hybrid battery and full electric vehicle technologies (for near term and long term ICMs) reflect higher than average indirect costs. As a result, the ICMs for those technologies can equal or even exceed the averaged RPE for the industry.' [EPA-HQ-OAR-2010-0799-9512-A1, pp. 20-21]

The ICCT strongly supports the continued use of ICMs and the adjustments made for the proposed rule. The sensitivity analyses presented in Tables IV-88, IV-89 and IV90 should be removed from the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 21]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 29-30.]

The ICCT also agrees with EPA's assessment of indirect cost that specifically addresses the factors that increase the retail price compared to the direct costs and generally -- and the general approach of assigning technologies to several complexity classes for determining the indirect cost multipliers. The use of generic retail price equivalency markup to cover a wide range of factors that are not consistent over different technologies often results in overestimating those costs. And we would recommend the Agency to scrap the sensitivity analysis conducted using the RPE markups.

---

24 Rogozhin, A., Gallaher, M., Helfand, G., McManus,. W., Using Indirect Cost Multipliers to Estimate the Total Cost of Adding New Technology in the Automobile Industry, International Journal of Production Economics 124 (2010): 360-368.

25 NAS. (2011). Assessment of Technologies for Improving Light Duty Vehicle Fuel Economy. National Academy of Sciences, Committee on the Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy; National Research Council. National Academies Press. Washington, DC.

Organization: National Automobile Dealers Association (NADA)

The proposal fails to fully account for all of the up-front marginal costs prospective new vehicle purchasers can expect to face due to the MY 2017-2025 CAFE/GHG mandates. In doing so, it fails to appropriately recognize the potential impacts those mandates will have on light-duty vehicle affordability and sales. Specifically, the proposal uses a non-traditional approach to estimating light-duty retail cost/price called the Indirect Cost Multiplier (ICM) method. [EPA-HQ-OAR-2010-0799-9575-A1, p. 4]

The traditional approach, used for at least 30 years by NHTSA and EPA and vehicle manufacturers to calculate the cost of regulations impacting motor vehicles, involves an accounting method known as Retail Price Equivalent (RPE). The RPE method appropriately estimates the ratio of indirect costs (marketing, indirect labor, etc) to the retail price for the whole vehicle, adjusting accordingly the direct costs (engineering, manufacturing, etc.) associated with new components. [EPA-HQ-OAR-2010-0799-9575-A1, p. 4]

The ICM method, which NHTSA and EPA first attempted to use to develop their MY 2012-2016 program, involves a somewhat arbitrary selection and allocation of indirect costs to certain compliance-related components. Under this approach, by no means the standard accounting method used by vehicle manufacturers, the whole cost of the vehicle rarely if ever reflects the sum of its parts. In addition, as detailed in the attached paper comparing the use of the RPE method to the ICM method, NHTSA and EPA use their ICM method differently for this proposal than they did for the MY 2012-2016 rule. For these and other reasons detailed in Exhibit A, NHTSA and EPA should recalculate average per vehicle costs for the proposal using the RPE method of accounting. To assist with that effort, the paper in Exhibit A attempts to do so, and even assumes NHTSA and EPA's projections of the technologies manufacturers will have to adopt to achieve compliance with the proposed standards. [EPA-HQ-OAR-2010-0799-9575-A1, p. 4]

Response:

Regarding the comments from ICCT that RPE indiscriminately spreads indirect costs over all components, we agree with ICCT and that is a big part of the reason we believe that the ICM approach is more appropriate for estimating costs in response to regulatory imposed changes. As for removing the RPE sensitivity, that comment is directed at NHTSA's analysis since EPA has not conducted a sensitivity using an RPE rather than ICMs.

We also agree with ICCT that our updated approach to applying ICMs (see Chapter 3.1.2.2 of the joint TSD), as first presented in the proposal and also used in the final rule—is more appropriate than our prior approach of applying the ICM as a simple multiplier.

Regarding the NADA comments, NADA argued that the ICM approach is not valid and should be replaced with an RPE approach. Further, it argued that the RPE factor should be 2x rather than the 1.5x approach that is supported by filings to the Securities and Exchange Commission. We have conducted a thorough analysis of the NADA comments on the RPE vs. ICM approach. We disagree with NADA's arguments for both using the RPE approach and a 2x RPE factor, for the following reasons.

NADA's objections to the ICM approach include:

1. There is no evidence that the RPE method is flawed.

2. The ICMs do not include the total costs of complying with the standards, because it does not include all the costs included in the RPE.
3. The ICMs use a subjective judgment to adjust indirect costs for different technologies, while the RPE uses one value for all components and does not rely on "nearly perfect foreknowledge."
4. The ICMs do not incorporate dealer and OEM profits.

NADA's arguments for the RPE of 2x include:

5. Several scholarly papers support the use of RPEs in the 2.0 range.
6. A case study comparison of the added content of a 1971 Chevrolet Vega and 2011 Cruze shows that an RPE of 2.0 accounts for the change in retail price.

The discussion above provides background on the issue of RPEs and ICMs, and on the agencies' decision to use ICMs to estimate indirect costs for this rulemaking. Our responses here address the specific points raised by NADA.

First, the RPE approach applies the same average indirect cost markup across all technologies in the redesigned vehicle fleet, regardless of the source of the direct cost (i.e. whether a technology is simple or complex; whether the source of the additional cost is a new or a mature technology). The RPE methodology also assumes that an indirect cost is associated with the rule, even if no relation is apparent. For instance, the RPEs (until recent union contract changes) would have included the costs to the domestic auto companies of the health insurance for retired auto workers. Because the rulemaking would not affect the current retiree health care costs, (which account for about 1.5% of the RPE), they are irrelevant to the rulemaking. The ICM approach differs in that it allows indirect costs to vary with the complexity of the technology and the time frame. It is a reasonable assumption that simple technologies are expected to have fewer indirect costs per dollar than complex technologies. For instance, the use of low-rolling-resistance tires, considered by the EPA/NHTSA team to be a low-complexity technology, adds costs, but, because they require significantly less vehicle integration effort than for example, adding a hybrid powertrain would, the additional indirect costs per dollar of direct manufacturing costs may be very low. In contrast, converting a conventional vehicle to a hybrid-electric is a far more complex activity, involving increases in indirect costs such as research and development disproportionate to its direct costs. Shortly after product introduction, indirect costs for components such as warranty and research may be relatively high, but auto makers are reasonably expected to be able to reduce the costs of any specific technology over time, as they gain experience with them and, thus, redirect those expenditures to other areas of their choosing.

Second, the ICM approach excludes some costs included in the RPE when those costs are expected not to be affected by the standards. The ICM approach, as discussed above, begins with the RPE and includes all the relevant cost categories. ICMs reflect the indirect costs judged by the EPA panel (see above for further explanation) to be incurred for each technology in response to regulatory imposed changes. Any "omissions", or instances where the ICM carries no costs for a given technology, are cases where the indirect costs are considered by the EPA panel not to be impacted by regulation-imposed changes for that technology. For instance, the costs of switching from a standard tire to a low-rolling-resistance tire (the example of a low-complexity technology in Rogozhin et al. (2009)) are not expected to lead to an increase in transportation costs (i.e., costs for transporting finished vehicles from production site to retail site) because it is not expected to be any more expensive to ship a new vehicle with the new tires than with the old tires.

Third, the RPE approach relies on the assumption that applying the average RPE for the vehicle fleet as a whole will produce a reasonable average indirect cost for all technologies in the redesigned vehicle fleet resulting from these standards. The agencies believe that using the professional judgment and expertise of EPA staff with extensive experience in the auto industry provides useful insight into how a given regulation will impact indirect costs and is an improvement over ignoring differences among technologies. The agencies have therefore based their central analyses on the ICM method.

Fourth, it is incorrect that the ICMs do not include OEM profit. Although the initial ICM report reviewed by NRC did not include OEM profit, the ICM approach applied in this rulemaking does incorporate an allowance for profit, at the average corporate profit rate of 6% of sales. The inclusion of profit for the Joint NPRM is discussed in the draft Technical Support Document, and the agencies have included profit as an element of the indirect costs for the final rulemaking as well. See Joint TSD section 3.1.2.2 endnote 19 and sources there cited.

Fifth, the papers cited by NADA to support the use of an RPE of 2x are only a subset of the literature. The National Research Council (NRC) discusses the four studies that NADA's Exhibit A cites in its support of an RPE of 2.0. The NRC also notes that NHTSA used an RPE of 1.5 for its MY 2011 fuel economy rule; the NRC in 2002 used an RPE of 1.4, as did the California Air Resources Board; and EPA has used a markup factor of 1.3. The NRC report then discusses work done for the committee itself, doing a detailed analysis of a Honda Accord and a Ford F-150 truck; the former had an RPE of "1.39 to market transaction price and 1.49 to MSRP," and the latter had an RPE of "1.52 for market price and 1.54 for MSRP." Most significantly, the NRC does not recommend an RPE of 2.0. Rather, the NRC recommends, for technologies where the primary manufacturer of the technology is the automotive supply base, an RPE of 1.5, except for hybrid powertrain components from the automotive supply base, where it recommends an RPE of 1.3 due to the inclusion of several indirect costs in their base estimate. Only in the case of technologies where an automotive OEM is the primary manufacturer does the NRC recommend an RPE of 2.0. We note, without specifically commenting on the quality of the studies, that none of the papers NADA cites in support of an RPE of 2x was published in a peer-reviewed journal, and none of the studies claim to have been peer-reviewed. In contrast, the research in Rogozhin et al. (2009) was peer-reviewed twice: as documented in the Peer Review Report, and when it was submitted (and accepted) for publication in the International Journal of Production Economics. A full reading of the literature on RPEs thus shows little support for a value of 2x. Further support for an average RPE lower than 2.0 comes from an examination of industry financial statements. NHTSA examined industry 10-K submissions to the Securities and Exchange Commission from the period 1972-1997. The cost information in these submissions represents all industry operations, including both OEM and supplier-sourced technologies. During this period, the RPE averaged 1.5 while varying slightly, but never dropped below 1.4 or exceeded 1.6. At no time did the average RPE approach the 2.0 value advocated by NADA.

Sixth, the comparison of the Vega and the Cruze uses circular logic; it assumes its conclusion. The direct costs of the vehicles are calculated using an RPE of 2, and the NADA analysis then calculates a quality difference based on the change in direct costs. The magnitude of the quality difference is then discovered to correspond to an RPE of 2, although it is also an inevitable result of the initial assumption of an RPE of 2. The analysis provided can be replicated with any value of RPE. This argument thus provides no evidence on the value of the RPE.

For these reasons, we do not accept NADA's request to use an RPE of 2x, and instead continue with our use of ICMs as the basis for our central analysis. However, the agencies recognize that there is uncertainty regarding the impact on indirect costs of regulatorily imposed changes. For this reason, both agencies have conducted sensitivity analyses using different indirect cost estimates. EPA presents its sensitivities in Chapter 3.11 of its final RIA where we show costs ranging from roughly $200 less to roughly $200 more than our primary case by adjusting ICMs to the low side and the high side, respectively. Therefore, even with the considerably higher indirect cost markups, the benefits of the final rule would be significantly higher than the costs.

12.3.3. Learning

Organizations Included in this Section

Alliance of Automobile Manufacturers

Organization: Alliance of Automobile Manufacturers

Are the Costs of Advanced Technologies Declining as Predicted? [EPA-HQ-OAR-2010-0799-9487-A1, p.18]

Future technology costs are among the most difficult things to predict for MY 2020 and beyond. Factors that can change significantly over time include the availability and price of materials and parts, the number of suppliers and the rate of progress toward the production levels needed to achieve economies of scale. [EPA-HQ-OAR-2010-0799-9487-A1, p.18]

Recently, the National Research Council of the NAS issued its Assessment of Technologies for Improving Light Duty Vehicle Fuel Economy ("NAS Report"). Although the NAS report provides future cost estimates for numerous technologies, the NAS warns that data from automobile manufacturers and Tier 1 suppliers suggests a wide range of estimated incremental costs "that makes assessments of cost-effectiveness very approximate." The NAS characterizes future technology costs as more difficult to predict than the impact of these technologies on fuel consumption. In some cases, the NAS cost estimates were significantly higher than those of the agencies. [EPA-HQ-OAR-2010-0799-9487-A1, p.18]

The uncertainty surrounding the costs of integrating new technologies and then reaching economies of scale is illustrated in NHTSA's discussion of how to assign markup factors for "learning." The Preliminary Regulatory Impact Analysis describes steps that NHTSA would need to take to develop accurate historical "learning" costs estimates for seven new CAFE and safety technologies. NHTSA concludes: [EPA-HQ-OAR-2010-0799-9487-A1, p.18]

This initial analysis…indicates that adopting a cumulative production basis for learning applications could produce cost estimates that are within 4-7% of those used in the NPRM by 2025, with less variation in earlier years. However, this analysis is based on a very small sample of technologies and the data required to more precisely evaluate this issue are currently unavailable. Further, these data may not be obtainable without an extensive research effort, if at all. [EPA-HQ-OAR-2010-0799-9487-A1, p.18]

Response:

We agree that future technology costs are very difficult to predict. We also believe that the effort we have made at doing so is unprecedented for EPA transportation-related rules and that we have developed the highest quality and most up-to-date technology cost estimates available today. EPA will also continue to monitor the costs of key technologies going forward. That said, we have conducted several sensitivities that serve to both increase and decrease our cost estimates—battery pack costs, learning effects, ICMs, and weight reduction costs—and for each of these sensitivities, we see very little impact on our overall program costs and benefits.

12.3.4. Maintenance Costs

Organization: National Automobile Dealers Association (NADA)

The benefits analysis used in the proposal uses an oversimplified pay-back method that overstates potential fuel economy savings. Instead, for purposes of calculating any "pay-back," real-world finance, opportunity, and additional maintenance costs should be accounted for. In other words, the final rule should evaluate its potential impact on a vehicle's total cost of ownership. An example of such a calculator is found at http://www.nadaguides.com/Cars/Cost-to-Own. [EPA-HQ-OAR-2010-0799-0639, p.10]

Response:

We have included maintenance costs in the final analysis—in both the benefit-cost analysis and the cost of ownership and payback analysis. We present our maintenance intervals and costs per interval in Chapter 3.6 of the joint TSD. We present our full analysis of maintenance costs in Chapter 5.2.2.1 of our final RIA and our cost of ownership analysis in Chapter 5.5 of our final RIA. We also respond more fully to NADA's comments in Chapter 5.5 of the final RIA.

12.3.5. Stranded Capital

Organizations Included in this Section

Center for Biological Diversity
International Council on Clean Transportation (ICCT)

Organization: Center for Biological Diversity

Further, the Agencies must delete from their analysis the supposed cost of “stranded capital,” or capital invested in manufacturing equipment that cannot be used when new technology is introduced. Because this rulemaking stretches over at least two complete redesign cycles, there is adequate lead time to amortize such costs within industry’s normal business operations. In other words, this and other relics carried over from shorter-term rulemakings that purported to take account of concerns about inadequate lead times must be scrapped. [EPA-HQ-OAR-2010-0799-9479-A1, p. 7]

Organization: International Council on Clean Transportation (ICCT)

9. Given the long lead times in the proposed rule, stranded capital costs will be virtually eliminated and should be removed or greatly reduced in the cost analyses. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

9) Stranded Capital Costs

The agencies state that 'potential for stranded capital occurs when manufacturing equipment and facilities cannot be used in the production of a new technology'.29 This is a valid concern, but it applies primarily to rulemakings with shorter leadtimes. Perhaps the most important purpose of proposing standards through 2025 is that it gives manufacturers far more certainty about the future standards. This enables the manufacturers to plan and implement technologies and products in an orderly manner and minimizes issues with stranded capital. Also, the standards are not stringent enough to force technology introduction at a rate faster than normal production cycles. [EPA-HQ-OAR-2010-0799-9512-A1, p. 22]

The ICCT recommends that stranded capital costs be eliminated to reflect the long leadtime of the proposed standards. [EPA-HQ-OAR-2010-0799-9512-A1, p. 22]

29 section 3.2.2.3 of the TSD, Table V-24 of NHTSA RIA, and Sections 3.8.7

Response:

We believe that it is difficult to quantify accurately any capital stranding associated with new technology phase-ins, especially given the projected and unprecedented deployment of technologies in the rulemaking timeframe. The FEV analysis that looked at potential stranded capital attempted to define the possible stranded capital costs for a select set of technologies. Since the direct manufacturing costs developed by FEV assumed a 10 year production life (*i.e.*, capital costs amortized over 10 years) we applied the FEV derived stranded capital costs whenever technologies were replaced prior to being utilized for the full 10 years. The other option would have been to assume a 5 year product life (*i.e.*, capital costs amortized over 5 years), which would have increased the direct manufacturing costs. We have accounted for stranded capital costs in the instances where our fleet modeling replaced technologies before the capital costs were fully amortized. While there is uncertainty about the possible stranded capital costs (*i.e.*, understated or overstated), their impact would not call into question the overall results of our cost analysis or otherwise affect the stringency of the standards, since costs of stranded capital are a relatively minor component of the total estimated costs of the rules. Table 5.1-5 of the final RIA presents the stranded capital costs used in our analysis; this table is copied below. As shown by this table, the stranded capital costs are relatively low so, even if we have overestimated these costs, their impacts are minor.

Table 12-1 Interpolated Estimates of Stranded Capital Costs (2010$)

Company	2017	2018	2019	2020	2021	2022	2023	2024	2025
Aston Martin	$60	$54	$48	$41	$35	$31	$26	$21	$17
BMW	$16	$20	$23	$27	$31	$26	$21	$16	$11
Chrysler/Fiat	$53	$45	$38	$31	$24	$22	$20	$18	$16
Daimler	$18	$19	$20	$21	$22	$19	$16	$13	$10
Ferrari	$9	$16	$24	$32	$40	$35	$31	$26	$22
Ford	$16	$17	$19	$20	$21	$18	$15	$12	$9
Geely	$16	$20	$23	$26	$30	$25	$21	$16	$12
GM	$18	$18	$18	$18	$18	$17	$16	$15	$14
Honda	$12	$12	$13	$13	$13	$15	$17	$19	$21
Hyundai	$7	$8	$8	$8	$9	$11	$12	$14	$15
Kia	$14	$21	$28	$36	$43	$38	$34	$29	$25
Lotus	$26	$23	$20	$16	$13	$12	$11	$11	$10
Mazda	$17	$22	$28	$33	$38	$32	$26	$20	$13
Mitsubishi	$15	$21	$27	$33	$39	$32	$26	$19	$13
Nissan	$12	$12	$13	$13	$13	$14	$14	$14	$14
Porsche	$19	$21	$23	$25	$27	$24	$21	$18	$15
Spyker	$36	$30	$25	$20	$14	$14	$15	$15	$15
Subaru	$8	$10	$11	$13	$15	$12	$10	$7	$5
Suzuki	$28	$25	$21	$18	$14	$14	$13	$12	$11
Tata-JLR	$17	$18	$19	$20	$21	$21	$20	$20	$20
Tesla	$1	$1	$1	$0	$0	$0	$0	$0	$0
Toyota	$5	$9	$12	$16	$19	$21	$22	$24	$25
Volkswagen	$14	$17	$19	$22	$25	$20	$15	$10	$5
Fleet	$14	$16	$17	$18	$20	$19	$18	$17	$16

Note: Results correspond to the 2008 baseline fleet.

12.4. Technology Packages, Projected Manufacturer Compliance Costs, Technology Penetration, and OMEGA/VOLPE

Organizations Included in this Section

American Council for an Energy-Efficient Economy (ACEEE)
Center for Biological Diversity
Jackson, F.W.
Smith, Frank Houston

Organization: American Council for an Energy-Efficient Economy (ACEEE)

The agencies state: “Because both input and output sheets from our modeling are public, stakeholders can verify and check EPA’s and NHTSA’s modeling, and perform their own analyses with these datasets.” (NPRM p.74904). We were unable to find the relevant OMEGA output sheets, however. These should be made available. [EPA-HQ-OAR-2010-0799-9528-A2, p.2]

Make available on the EPA web site the OMEGA outputs for the various scenarios considered. [EPA-HQ-OAR-2010-0799-9528-A2, p.3]

Organization: Jackson, F.W.

My definitions of Mid and Max technologies: [EPA-HQ-OAR-2010-0799-8041-A1, p. 4]

InitialMidPkg: half, or less, cylinders 4 plug/cylFlatEng (1.5 & up Dia/StrokeRatio), later Ignition, increase cr/egrs/fpm, Fast Warmup, HEV-many more improved & optimized, No Plug-ins, more supercharge & Atkinson cycle, polish (tbr), MinCornEthanol, Wt Red, consumer/driverEd, traffic controls, adequate but not excess power/size/wt, update CAFÉ continuous + exclude subsidized, more Transmission speeds & some Auto ManuaI Tran. some EPA & NHTSA items, some NG, Efficient AC, HighMileage/yr SpeciaI Attention/Preference, Scrub Features/costs[EPA-HQ-OAR-2010-0799-8041-A1, pp. 4-5]

Final Mid Pkg: Purge, FRed, Ring, reduced drags (aero, rolling, etc.) and more initial Mid.

Adv Max Ultimate Pkg: more of above with all possibilities seriously considered [EPA-HQ-OAR-2010-0799-8041-A1, p. 5]

Organization: Smith, Frank Houston

It is my hope that the two attachments

1. Proposed 2017 - 2025 CAFÉ, A personal study, The ICE POSSIBILITIES and OPPORTUNITIES - COSTS, FUEL ECONOMIES, and Concerns 2/7/2012

2. Supplement Proposed 2017 - 2025 CAFÉ, A personal study, The ICE POSSIBILITIES and OPPORTUNITIES - COSTS, FUEL ECONOMIES, and Concerns 2/13/2012

offer a positive and constructive technical and economic contributions toward this US effort to address future fuel consumption rates and CO_2 emissions reduction. [NHTSA-2010-0131-0240, pp.1-2]

Opportunities, and Conclusions

If these 335 (343?) vehicles were available in the US today, there is a high probability almost 23% of new US offerings would provide user experience mpg averages approaching, if not exceeding, the currently proposed NOMINAL of 54.4 mpg for 2025 CAFÉ … today … for the light-footed US drivers using these fuel frugal small displacement, generally under 2 Liters, diesel models, many already seen on the US roads using their significantly less fuel frugal gasoline powertrains, see Table 1 or Table 3 Largest Models ?60 mpg(Imp) combined for some of the model configurations studied. [NHTSA-2010-0131-0240-A2, p.4]

Of course there are questions of correlation between EPA and NEDC ratings as well as USER experience. The US VW/Audi diesels “Shared MPG Estimates” suggest viable correlations exist with NEDC. And, 'Predicting Individual Fuel Economy' by Lin, Z., and Greene, D. address other related US issues. [NHTSA-2010-0131-0240-A2, p.5]

Almost all of these fuel frugal vehicles are small displacement diesels, raising issues of emissions. Euro Step V should have resolved issues with particulates leaving the NO_X concerns since ? 180 mg NO_X/km is the current EU requirement. Most of these vehicles are currently certified between 110 and 150 mg NO_X/km. [NHTSA-2010-0131-0240-A2, p.5]

Starting 4Q 2014 (32 months) Euro Step VI requires ? 80 mg NO_X/km for all new certifications of these vehicles. That is ? 37 mg/km worst case outside the current US requirement of roughly ? 43 mg NO_X/km. [NHTSA-2010-0131-0240-A2, p.5]

Could some compromise regarding mg NO_X/km levels be allowed as long as annual sales volumes for these very fuel frugal vehicles remain below, for sake of discussion, 1 (or 0.5) million units/year? That would be an average of ?20k vehicles for each State annually. [NHTSA-2010-0131-0240-A2, p.5]

Would that level of market penetration pose an unacceptable risk to man and/or environment versus the benefits? The 2011 US clean diesel sales were ?100K, roughly 70% relatively fuel frugal from VW/Audi. [NHTSA-2010-0131-0240-A2, p.5]

Could this be allowed as a temporary legislative regulatory waiver until volumes exceed ½ million annually or 2016, whichever comes first, before enforcement of full US emissions standards, as a quick, low cost, low risk strategy to educate the US consumer and test market for determination of consumer acceptance … and preferences? [NHTSA-2010-0131-0240-A2, p.5]

This would reduce OEMs’ costs and risks (as well as objections) to introducing this relatively lower cost fuel conserving technology without Federal or State funding as a bridge to future technologies. [NHTSA-2010-0131-0240-A2, p.5]

This could offer a quick, very low cost, low risk path to saving 400~500 gallons of gasoline (about 24 barrels of crude) per vehicle year for the life of the vehicle when compared to the 2011 US fleet average of 22.2 mpg. And, achievable at a lower cost than most proposals currently under public consideration. [NHTSA-2010-0131-0240-A2, p.5]

IF, assembled in the US and reasonably priced, this should expand the current US auto market demand, increasing domestic production … creating NEW US industrial jobs simply by changing the current US powertrains to existing fuel frugal European small displacement (? 2 Liter) turbo diesel technology. [NHTSA-2010-0131-0240-A2, p.5]

Based on Table 1: Relative UK Cost and Fuel Economy BENEFIT Analysis (gasoline versus diesel), these fuel economies can, on average, be achieved with an average ? USD $2k technology cost premium per vehicle, IF … we, as a Nation, are determined … and the OEMs do offer AND deliver to the US consumer these types of fuel frugal machines with comparable EU diesel powertrain pricing differentials. [NHTSA-2010-0131-0240-A2, p.5]

Unfortunately, if Det3 US are not at parity with world fuel economy and CO_2 emissions by post 2015, they will be under constant threat from “foreign” OEMs like Kia, Hyundai, Mazda, & Volvo for importation of fuel frugal choices already offered in the EU and Asia resulting in subsequent loss of US market share & US JOBS.

References:

http://carfueldata.direct.gov.uk/

http://vanfueldata.dft.gov.uk/Default.aspx pickups/vans, 30 mpg(US) average Sprinter 2500 in US 2013?

http://www.autocar.co.uk/SpecsPrices/SpecsAndPrices.aspx

http://www.fueleconomy.gov/feg/powerSearch.jsp

http://www.fueleconomy.gov/mpg/MPG.do?action=browseList “Predicting Individual Fuel Economy' by Lin, Z., and Greene, D. SAE Technical Papers #2011-01-0618 © 2011 [NHTSA-2010-0131-0240-A2, p.5]

It is very important to understand that FUEL FRUGAL small displacement (? 2 Liters) Euro type turbo diesels are a potentially viable near term interim bridge solution to allow time for ADVANCED transport technologies, whether plug-in, fuel cell, or other yet to be found technology, to evolve and mature (cost, reliability, durability, and economies of scale) necessary for the broader based US (and WORLD) markets, not just the elite/wealthy … in order to maintain/improve standards of living. [NHTSA-2010-0131-0240-A2, p.6]

Does the US want/NEED fuel conserving vehicles NOW? IF, yes, what should WE do to get there? This is one way. [NHTSA-2010-0131-0240-A2, p.6]

Response:

Regarding the ACEEE comment about our output sheets, these were made available in the public docket at document ID EPA-HQ-OAR-2010-0799-1105.

Regarding comments from F.W. Jackson and Frank Houston Smith, we appreciate your comments and your interest in our proposal. Regarding relaxing NOx standards to allow for diesels to more easily meet US emission standards and, therefore, play a larger role in the US auto market, we disagree with this idea. We have set stringent, fuel neutral emission standards for purposes of public health and do not believe it is appropriate or necessary to compromise public health by relaxing the standards for diesel-fueled vehicles (see 65 FR 6698). We believe that diesels can meet our stringent standards, and we welcome diesels as part of the light-duty technology mix. The lack of significant diesel penetration in our analysis simply means that we do not believe that it provides for the most cost effective path to compliance. It should not be interpreted as a condemnation of the technology or a prohibition of it as auto makers are free to use whatever technology they choose provided they can comply with applicable standards.

13. Vehicle Safety

13.1. General Comments on Vehicle Safety

Organizations Included in this Section

Consumer Reports
Consumers Union
Haroldson, C.
Institute for Energy Research (IER)
Institute for Policy Integrity, New York University School of Law
International Council on Clean Transportation (ICCT)
Marshall, C.
Rafter, M.
Ross, D.
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Steyn, R.

Organization: Consumer Reports

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 168.]

Importantly, proposed targets will unlikely compromise vehicle safety. Cars have been getting safe as fuel economy has improved. And this trend will continue.

The safety of future vehicles will be dominated by vehicle design, not size and weight. Advanced materials can decouple size from mass and therefore give economy, safety and functionality that people require.

Organization: Consumers Union

Importantly, the proposed standards are unlikely to compromise vehicle safety. Cars have been getting safer as fuel economy has improved, and this trend is likely to continue. The safety of future vehicles will be dominated by vehicle design, not size or weight. Advanced materials can decouple size from mass (weight), creating important new possibilities for simultaneously improving both fuel economy and safety without compromising functionality. [EPA-HQ-OAR-2010-0799-9454-A2, pp.2-3]

Organization: Haroldson, C.

vehicles will necessarily become too small to be safe to drive. [EPA-HQ-OAR-2010-0799-11137-A1, p. 1]

Organization: Institute for Energy Research (IER)

One of the most obvious effects of higher fuel efficiency is a lighter vehicle, which (other things equal) means a vehicle that provides less safety for its occupants in the event of a crash. Anecdotally, it is typical to hear a father explain his vehicle purchase for a daughter going off to college in terms of its safety, rather than couching the decision in terms of how much money she will save in fuel expenditures. [EPA-HQ-OAR-2010-0799-9573-A1, p. 14]

Scholarly studies have attempted to quantify the extra motorist deaths attributable to the CAFE standards first put into place in the 1970s. Depending on the particular assumptions and the time frame chosen, the estimates range from 41,600 to 124,800 deaths. A 2002 National Academy of Sciences study found that the downsizing effect of CAFE led to 1,300 to 2,600 deaths in a single year and ten times that many serious injuries. Also, weight in vehicles still matters and one way to get better fuel efficiency is through weight reductions. A study from the Insurance Institute for Highway Safety recently found that “strong relationship between vehicle weight and occupant safety.” In fact, they found that “Hybrids on average are approximately 10 percent heavier than their conventional counterparts and have lower injury rates in a crash. . . the odds of sustaining an injury in a hybrid were about 25 percent lower than in a lighter non-hybrid vehicle.” [EPA-HQ-OAR-2010-0799-9573-A1, pp. 14-15]

It is important to note that even if the EPA’s analysis is correct to assume that vehicle consumers do not correctly calculate the lifetime savings from higher fuel efficiency, then by the same token we must allow for the possibility that vehicle consumers may not correctly estimate the higher probability of injury or death from driving a car that is lighter or has less space between the steering wheel and driver’s seat, etc. In order to achieve its findings of a pure boon to consumers, the EPA analysis assumes that the higher mileage standards are achieved through holding all else constant, and increasing the final price of vehicles. But in reality, in the new equilibrium the “irrational” and “myopic” consumers may buy vehicles that achieve the new efficiency mandates through a combination of less safety and only slightly higher prices. To the extent that this calculation is “irrational” and “myopic,” the regulations may reduce one type of inefficiency (i.e. excessive fuel consumption) while increasing another one (i.e. excessive crash deaths). EPA certainly has offered no argument showing that fuel consumption is a more serious social problem than traffic fatalities.37 [EPA-HQ-OAR-2010-0799-9573-A1, p. 15]

---

37 To be clear, the text refers to traffic fatalities that result from consumers incorrectly estimating the tradeoff between vehicle price and safety. The EPA analysis does incorporate costs from traffic accidents, but these appear to include only the accidents due to extra driving, not to consumer “irrationality” regarding vehicle safety.

Organization: Institute for Policy Integrity, New York University School of Law

More importantly, the relationship between size and safety is neither simple nor unidirectional. To the extent smaller cars fare worse in crashes with bigger cars, increasing size may improve an individual driver’s safety; but it may simultaneously impose a negative safety externality on other drivers, whose cars are now relatively smaller compared to the growing average fleet size. Decreasing size may have similarly opposing impacts on safety. Therefore, maintaining or increasing the average size of the entire fleet does not guarantee the safest outcome, and decreasing the fleet's average size in response to a fuel economy rule might have no overall change in safety levels (though at some point, reducing the size or changing attributes could affect the vehicle's intrinsic safety, as distinct from its relative safety). As Wenzel, a leading researcher on this subject, has explained, "a fuel economy standard that discourages vehicles with smaller footprint, or lower weight, will not necessarily reduce casualties. . . .Details of vehicle design, which can be improved through direct safety regulations, will have a greater effect on occupant safety than fuel economy standards that are structured to maintain vehicle size or weight." [This comment can also be found in section 2.1 of this comment summary.] [EPA-HQ-OAR-2010-0799-9480-A1, p. 14]

Organization: International Council on Clean Transportation (ICCT)

Even more important, all of the historical analyses of the impacts of weight on fatalities are based upon vehicles primarily using conventional steel. This means that the results implicitly assume that the materials in the vehicle will not change. However, high strength steel (HSS) and aluminum both have better crash properties than standard steel. Thus, reducing weight of small cars using better materials will reduce fatalities. Aluminum provides more uniform management of crash forces. High-strength steel helps prevent intrusion and better absorbs crash forces, which is one of the primary reasons for its rapidly increased market penetration in recent years. For example, Honda has moved aggressively towards using HSS in small cars in part because of the safety benefits: [EPA-HQ-OAR-2010-0799-9512-A1, p. 12]

'The extensive use of high-strength steel in the Advance Compatibility Engineering (ACE) body structure creates a new-generation platform that is safer and stronger, enhancing the vehicle's ability to deal with crash energy during impact.'6 [EPA-HQ-OAR-2010-0799-9512-A1, p. 12]

'A new body design with the ACE Body Structure and extensive use of high strength steel create a new generation platform that is safer and stronger.' 7 [EPA-HQ-OAR-2010-0799-9512-A1, p. 12]

In addition, fatalities are linked more strongly to intrusion into the passenger compartment than to vehicle mass. Safety experts in Japan and Europe raised this issue previously. Their research suggests the main cause of serious injuries and deaths is intrusion due to the failure of load-bearing elements to properly protect occupants in a severe crash: [EPA-HQ-OAR-2010-0799-9512-A1, p. 12]

'The results from this project have overturned the original views about compatibility, which thought that mass and the mass ratio were the dominant factors.'8 [EPA-HQ-OAR-2010-0799-9512-A1, p. 12]

'moreover, if mass appears to be the main parameter linked to aggressivity of cars, it is because this is the easiest and universal parameter that is collected in all accident databases.'9 [EPA-HQ-OAR-2010-0799-9512-A1, p. 12]

'The scientific community now agrees that mass does not playa direct role in compatibility.'10 [EPA-HQ-OAR-2010-0799-9512-A1, p. 12]

Reducing vehicle weight while maintaining size helps to reduce intrusion, as the lower weight reduces crash forces while maintaining size preserves crush space. This also supports that size-based standards that encourage the use of lightweight materials should reduce intrusion and, hence, fatalities. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 12-13]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 195-196.]

The recent development of sophisticated and accurate vehicle simulations is opening up a new world. The initial use of these models was to improve safety design. The simulations were so effective that 5 star crash ratings became almost universal and NHTSA had to revise their rating criteria. The simulations are continuing to rapidly improve to the point where they are starting to be used to simultaneously optimize the material composition, shape and thickness of every individual part, including secondary weight reductions.

Organization: Marshall, C.

Historically, there have been two topics of pushback by those who would oppose this standard. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Regarding highway safety, same-size cars for improving mileage can be made with lighter more energy-absorbing materials without increasing risks on the highways. [EPA-HQ-OAR-2010-0799-5917-A2, p. 2]

Organization: Rafter, M.

Car makers have made cars less safe to meet the standards that the government keeps imposing. [EPA-HQ-OAR-2010-0799-11587-A1, p. 1]

Organization: Ross, D.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 242-243.]

Are fuel-efficient vehicles unsafe? Critics anticipate that weight reduction will be a major strategy to achieve greater fuel economy in a cost-effective manner, and that this will increase the likelihood of injury or death from vehicle collisions.

They point to the 50 percent increase in fatalities resulting from accidents involving passenger cars and light-truck SUVs experienced between 1979 and 1999.

But it wasn't so much the decrease in weight of passenger cars as the dramatic increase in the light-truck SUV share of all vehicles on the road that drove that statistic.

The proposed standard limits any further worsening in vehicle weight disparities by linking fuel economy standards to vehicle footprint.

If fuel economy gains are concentrated in high-end vehicles through new materials or increasing reliance on hybrid technology, then fleet weight disparities may even diminish.

In my view, critics have failed to refute the reasonable NHTSA projections of a modest increase in safety under the 2017-25 standards.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Smart fuel economy improvements deliver safety, as well as better mileage and lower emissions: Advanced high strength and light weight materials and other recent technological and design breakthroughs—along with well-engineered weight reduction—give us the ability to travel safely and save money in cars that cut the emission of global warming pollution by 5% and, at 54.5 mpg, ease our oil addiction. [EPA-HQ-OAR-2010-0799-9549-A2, p. 10]

The improved safety record of crossover vehicles compared to truck-based SUVs, stemming from improved technology, teaches us that manufacturers are capable of designing vehicles that are lighter, more efficient and safer as well. [EPA-HQ-OAR-2010-0799-9549-A2, p. 10]

Technology is the key to better mileage and safer cars. With strong, lightweight materials, we can have both. Better engines, transmissions and aerodynamics improve fuel economy; airbags, high-strength lightweight steel and better roofs improve safety. And reducing the throw weight of vehicles improves the safety of everyone on the road. [EPA-HQ-OAR-2010-0799-9549-A2, p. 11]

Organization: Steyn, R.

The new rule also will lead to a significant increase in the number of driving-related deaths and injuries because it can be met only by reducing the size and weight of passenger vehicles. [EPA-HQ-OAR-2010-0799-8724-A1, p. 2]

Response:

Several commenters maintained that decreased vehicle weight could lead to decreased vehicle safety. Others commented that vehicle safety is chiefly related to vehicle design, rather than to vehicle size or weight. Comments on these issues are addressed principally in section II.G of the preamble to the final rule. We add certain supplemental responses below.

The commenters who state that the standards could lead to a decrease in vehicle safety assert that the standards will be met by mass reduction, or in some cases, downsizing, and that either strategy carries with it associated safety risks. EIR points to the 1970's experience as evidence that manufacturers' use of downsizing as a compliance strategy for the flat (i.e. universal) CAFE standards can result in increased vehicle fatalities. EPA disagrees with commenter's analogy to the current rule. As the agencies explain in preamble section II.G, historic field crash data is not necessarily a predictor of safety of the current or future light duty vehicle fleets. EPA also notes that three important factors differentiate the rulemaking today from the 1970's: 1) the footprint approach to standards, 2) the presence of crash safety standards which were not in existence in the 1970's, and 3) the advancements in design tools and techniques that have occurred over the past few decades.

Footprint-based standards

After the first CAFE standards were introduced in the 1970's, manufacturers achieved compliance in part by reducing vehicle size. The use of the footprint attribute for this rulemaking largely eliminates any incentive for manufacturers to downsize vehicles as a compliance strategy, since doing so simply makes their overall fleet average target more numerically stringent, as described in section II.C of the preamble. Indeed, this was a prime motivator to adopt so-called reformed CAFE, whereby standards would no longer be flat. Furthermore, unlike a weight-based standard, a footprint based standard does not create disincentives for manufacturers to apply weight-efficient materials and designs. From the engineering and statistical safety analyses reviewed by the agencies NHTSA concluded, and EPA agrees, that the societal effect of mass reduction while maintaining footprint, if any, is small (see section II.G.3 of the preamble).

Crash safety standards

The commenters did not address the role of federal safety standards, including crash standards, to which the current and future vehicle fleet are subject. NHTSA began frontal crash testing in 1978 and adopted the five star rating in 1993, adopted the side impact crash test in 1996 and the rollover test in 2000 with an overhaul of the program in 2008. In addition, there are other tests including those by the Insurance Institute for Highway Safety tests (IIHS) and other countries, including Europe and Japan, which must be met in order to sell vehicles in those countries. This continued advancement in safety standards is reflected in the steady decline in fatality rates. As shown in the figure in Section 3.3.5.5 of the Joint TSD, the motor vehicle crash deaths per billion miles traveled in the late 1970's were 3 times that of those in 2009 (11.3 per billion in 2009). Another figure in the same chapter shows the Light duty fleet weight trends: 1975-2011. The figure shows that vehicles have increased in weight over the past 30+ years since the late 1970's and while vehicle designs today and in the future may be of similar weights, the manufacturers are accountable to safety standards today. Safety standards will stay in place, so that it is not possible for auto makers to reduce safety below those requirements in order to improve fuel economy.

Advancements in design tools and techniques

EPA agrees with commenters who observed that design plays an important role in safety (Consumers Union, D. Ross, Sierra Club). The design tools that are available today are significantly more advanced than when fuel economy standards were first established, and manufacturers now routinely utilize CAE/CAD tools to simulate crashes prior to a prototype build. This allows them to design the vehicle to reduce passenger compartment intrusion and distribute crash loads more efficiently, as well as evaluate dummy injury criteria. If all design concepts were held constant to the early 2000s then lighter cars could possibly mean higher dummy accelerations. However, vehicle designs are changing. For example, the more optimal management of crash energy in crush zones and design of multiple load paths can minimize acceleration pulses experienced in the passenger compartment of the vehicle. In addition, there has been continued advancement of restraint system technology, such as air bags that provide more complete coverage of the passenger compartment, and restraints that respond according to the specific occupant and crash conditions.

EPA notes that uncertainty still exists about whether this rule will affect how consumers evaluate fuel savings or safety. Still, EPA does not believe, as EIR suggests, that this rule will cause consumers to value safety less than they do currently. If consumer buying strategies do not change, as is very possible, then the rule will not affect how consumers evaluate these issues. It is also possible that fleet-wide efficiency increases will reduce the emphasis consumers place on fuel economy as a distinguishing attribute, and place greater emphasis on safety features, rather than less, as IER argues. Information on vehicle safety, and crashworthiness in particular, is readily available to vehicle purchasers. We note that NHTSA assigns crash ratings to each vehicle design based on the results of these tests, and this information is commonly part of the consumer's decision process in vehicle choice. Even if consumers seek a less expensive vehicle in response to the increased costs, all vehicles will continue to meet the applicable federal safety standards.

13.2. Comments on NHTSA/EPA's Engineering Analysis of Vehicle Safety Including Light Weight Materials

Organizations Included in this Section

Alliance of Automobile Manufacturers
Aluminum Association's Aluminum Transportation Group
American Chemistry Council (ACC)
American Iron and Steel Institute (AISI)
Bayer Material Science
Center for Biological Diversity
Consumers Union
Insurance Institute for Highway Safety (IIHS)
International Council on Clean Transportation (ICCT)
Nissan North America, Inc.
SABIC Innovative Plastics US LLC
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Society of the Plastics Industry, Inc. (SPI)
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

Automakers, in conjunction with NHTSA and others, continue to work toward a common goal of reducing the annual number of fatalities and injuries that occur in motor vehicle crashes. The

Alliance supports a CAFE and GHG rule structured to allow automakers to balance competing requirements in a manner that furthers this progress. [EPA-HQ-OAR-2010-0799-9487-A1, p.20]

Alliance members recognize that highway traffic safety is a shared responsibility and strive to do their part through the continuous improvement of the safety performance of their vehicles. NHTSA recently announced that the 2010 road fatality rate reached an historic low of 1.10 fatalities per 100 million vehicle miles traveled. Fatalities declined in most categories in 2010, including for occupants of passenger cars, SUVs, minivans and pickup trucks.7 We take pride in our contributions toward this historic achievement and continue to work toward future progress by developing additional crashworthiness enhancements and introducing crash avoidance technologies. As breakthroughs in advanced material and powertrain technologies become available and their associated costs meet customer thresholds for affordability, consumers will benefit through an increase in vehicle fuel efficiency and a decrease in greenhouse gas emissions. However, the Alliance is mindful that such improvements must be implemented in a manner that does not compromise the rate of safety improvement that has been achieved to date. [EPA-HQ-OAR-2010-0799-9487-A1, p.21]

Achieving the proposed CAFE and GHG standards will rely on the availability of commercially viable emerging technologies for manufacturers to adopt. Should these technologies fail to mature as anticipated, greater reliance on mass reduction and downsizing in order to achieve these standards could occur. The Alliance supports the proposed mid-term evaluation and urges EPA and NHTSA to continuously update the safety analysis as part of this review. [EPA-HQ-OAR-2010-0799-9487-A1, p.21]

Even though the current rulemaking extends well into the future, there is a possibility that many of the advanced technology and mass reduction projections may not be realized in the proposed timeframe. Thus, when the agencies conduct their mid-term evaluation, it is critical that the safety analysis is updated to reflect the most recent crash data and revised projections regarding mass reduction scenarios. [EPA-HQ-OAR-2010-0799-9487-A1, p.21]

The Alliance supports NHTSA's intention to examine safety from the perspective of both the historical field crash data and the engineering analysis of potential future Advanced Materials Concept vehicles. NHTSA's planned analysis rightly looks backward and forward. However, with respect to looking ahead and the evaluation of concept vehicles, the Alliance recognizes that it is not sufficient to only consider regulatory and consumer information crash tests. A comprehensive evaluation of vehicle safety must also take into account real-world impact scenarios and the special requirements of vulnerable populations (e.g., children and elderly). These must also be adequately accounted for in any agency policy decisions. [EPA-HQ-OAR-2010-0799-9487-A1, p.21]

Analysis of the Lotus and FutureSteelVehicle concepts indicates that although these concept vehicles can be designed in a virtual world to perform well in virtual Federal Motor Vehicle Safety Standards and virtual Insurance Institute for Highway Safety tests, there remain concerns that these concepts yield aggressively stiffer crash pulses that may be detrimental to rear seat occupants, vulnerable occupants and potential crash partners. Given the Computer-Aided Engineering (CAE) crash modeling uncertainties with respect to advanced materials that may possibly be available for mass production in the MY 2017-2025 time-frame, it is possible that the real-world crash behavior of these concepts may not match that predicted in those studies. [EPA-HQ-OAR-2010-0799-9487-A1, pp.21-22]

Further, significant uncertainties exist with respect to both manufacturing and CAE crash analysis of potential future advanced materials. CAE capabilities for some potential advanced materials that manufacturers are researching are far less mature than for materials currently in common use. Progress in these areas is highly competitive and therefore varies throughout the industry. As such, it will take considerable time and investment for each manufacturer to develop this knowledge and experience. Because agency projections fail to adequately take into account the timing and cost for the introduction of advanced materials, these projections are likely overly optimistic. [EPA-HQ-OAR-2010-0799-9487-A1, p.22]

Organization: Aluminum Association's Aluminum Transportation Group

The aluminum industry shares and supports the agencies' priority for continuous improvement in vehicle safety. We congratulate NHTSA for the thorough, thoughtful and professional approach taken in analyzing the relationships between vehicle design attributes and safety performance. Mass reduction has been identified as an important part of a comprehensive vehicle fuel economy improvement initiative, and must be implemented in a manner that preserves, or enhances vehicle safety. Developing an appropriate assessment of potential vehicle weight reduction opportunities requires understanding the independent influence of mass, size, design and safety features. Limitations of available historical data and currently available safety modeling make reliable assessment of individual safety technologies difficult. It is even more difficult to reliably anticipate the potential impact of future advancements in vehicle safety engineering or deployment of advanced safety enhancing technologies. [NHTSA-2010-0131-0226-A1, pp. 3-4]

Considering the uncertainties involved, we believe the agency's position on vehicle weight reduction is based on an objective and well reasoned assessment of all available information and is appropriately conservative. Recent NHTSA studies, and the NPRM indicate downweighting of large and mid-size vehicles will have a "neutral or positive" impact on overall fleet safety while improving fuel efficiency. In this vehicle segment automakers are using low weight, high-strength materials now and will increase use of these materials in the future. With respect to smaller vehicles, data clearly identifying independent impact of mass, size, design and advanced safety technologies is not available today. Due to uncertainty about the influence of mass, design and size on safety of smaller vehicles, the NPRM does not anticipate significant mass reduction in vehicles below 3,000 pounds. Analytical safety studies conducted by the ATG and others suggest vehicle size, not weight, has the largest impact on vehicle safety performance. We believe advanced small vehicle designs will be developed using aluminum body and structural components that will achieve significant weight reduction while preserving vehicle size and improving safety performance. [NHTSA-2010-0131-0226-A1, p. 4]

The ATG also serves on the steering committee for the Center for Automotive Research's (CAR) recently formed Coalition of Automotive Lightweighting Materials (CALM), which supports efforts by auto manufacturers to aggressively downweight vehicles to improve performance, fuel economy and safety. CALM's purpose is to support the cost-effective integration of mixed materials to achieve significant reductions in weight through the collaborative efforts of technology providers with the auto manufacturers. Through individual company efforts and through the new CALM partnership, the aluminum industry is committed to working with our customers and other suppliers to further accelerate and ease the adoption of advanced materials options (Attachment E [see Docket number NHTSA-2010-0131-0226-A5]). [NHTSA-2010-0131-0226-A1, p. 4]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 223-227.]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 227-228.]

So in conclusion, we see that weight reduction, weight optimized future vehicles and components will take maximum advantage of available engineering materials. These materials are continually being improved to further enhance the ability of auto designers to design efficient vehicles. Materials including aluminum, high-strength steel, magnesium and Aluminum offers a unique combination of composites will all find use in the vehicles of the future, they'll work -- live together in more efficient vehicle structures.

Aluminum offers a unique combination of attributes including low weight, high strength, excellent energy absorption capability, natural corrosion resistance at a reasonable cost. For those reasons, we believe aluminum will play an increasing role in the optimized vehicle of the future.

Organization: American Chemistry Council (ACC)

The agencies have stated their intention to achieve lightweighting of the fleet in a manner that does not compromise vehicle safety. The agencies have chosen to "provide an incentive to use lightweight materials and structures," rather than "reductions in size," by adopting a footprint approach to emission reductions. We support the agencies' adoption of the footprint approach, and our members are committed to bringing to market materials and technologies that help achieve that goal. As an industry that makes modern innovative materials, we have a proud history of our many contributions to automotive safety. Plastics are integral to airbags, seat belts, shatter resistant sunroofs, and so many more features. We strongly believe that vehicle mass reduction and overall fleet safety can be achieved hand-in-hand, and support the agencies' approach. [EPA-HQ-OAR-2010-0799-9517-A2, p. 1]

The Notice of Proposed Rule Making (NRPM) also observes that ongoing research may help refine our understanding of mass, vehicle size, and safety, particularly in connection with improved design and material use. Supporting research on safety is important to us, and the ACC Plastics Division's Auto Team has worked closely with the National Highway Traffic Safety Administration (NHTSA) on several initiatives to address automotive safety issues. For example, ACC and several member companies are participating in several NHTSA research projects on the safety of lightweight vehicles, including the Lotus Engineering and the George Washington

University studies, which seek to refine understanding of mass and crashworthiness.[3] The latter study, scheduled to conclude in July, 2012, has been highlighted by Secretary LaHood and NHTSA as one of the tools they are using to ensure safety while promoting vehicle mass reduction. [EPA-HQ-OAR-2010-0799-9517-A2, p. 1]

Through another effort with NHTSA, in November 2005, the American Plastics Council (now ACC's Plastics Division), in cooperation with NHTSA, sponsored a Technology Integration Workshop on "Enhancing Future Automotive Safety With Plastics." Findings from the workshop were published in a Technology Integration Report in May 2006, noting the major opportunities and challenges for enhancing the safety of next generation vehicles using advanced plastics and composite materials in structural and safety applications. In 2005, Congress directed NHTSA to explore the potential safety benefits of lightweight, fuel efficient Plastics and Composites Intensive Vehicles (PCIVs),[4] and develop the foundation for research in cooperation with the Department of Energy, industry, universities and other safety stakeholders. [EPA-HQ-OAR-2010-0799-9517-A2, pp. 1-2]

Significant progress has been made in this effort. NHTSA tasked the Volpe Center to assess the current state of knowledge and emerging safety technology opportunities to enhance the crash safety of PCIVs by 2020. In November 2007, NHTSA published A Safety Roadmap for Future Plastics and Composites Intensive Vehicles, and the agency is in the process of implementing the Roadmap.[5] In August 2008, NHTSA hosted a workshop entitled, The Safety Characterization of Future Plastic and Composites Intensive Vehicles.[6] NHTSA has already moved much closer towards its goal of facilitating development and deployment of next generation safe and fuel efficient PCIVs by 2020; we encourage and support NHTSA, in coordination with the private sector, to complete its work implementing the roadmap, and integrate relevant findings into this rule as appropriate. [EPA-HQ-OAR-2010-0799-9517-A2, p. 2]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 265-266.]

Why is this important? The proposed rule makes clear the relationship between fuel savings and lightweight of the vehicle. The proposal acknowledges that mass reductions of vehicle can be achieved in many ways, including material substitution, design optimization and part consolidation. We agree. PCIV research amply documents the technological feasibility of designing and building vehicles with 30% or more plastic and plastic composites, and in our view, the agencies' application of mass reduction of up to 20% relative to model year 2008 levels is appropriate and achievable.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 266-267.]

But there's more. Plastics are about more than just light-weighting of vehicles, plastics and polymer composites have enabled some of the most significant vehicle safety innovations in the past several decades including seat belts, airbags, child safety seats, and the same sources of these innovations still hold significant untapped potential to further enhance vehicle safety.

We agree with the agencies that it is important that the CAFE standards be set in a way that does not encourage manufacturers to respond by selling vehicles that are in any way less safe. In particular, we agree with and support the standard applied in assessing compliance strategies, and this is articulated as no adverse effect on overall fleet safety.

In the last five years the plastics industry has worked aggressively to better understand how plastics can be used to enhance safety in automobiles and we will continue to do so. Congress recognized the importance of enhanced automobile safety by investing nearly $2 million over a four-year period and to building an ongoing partnership between the plastics industry and NHTSA, and through this partnership, NHTSA has initiated and is currently implementing a safety roadmap for future plastics and plastic composites intensive for vehicles.

This project is already yielding fruit, as ongoing research is helping to improve the performance of plastic and composite material components. We support NHTSA'S sustained work to implement the safety roadmap.

---

3 See transcript of NHTSA Mass Size Safety Symposium, February 25, 2011, http://www.nhtsa.gov/staticfiles/rulemaking/pdf/MSS/MSSworkshop_transcript.pdf

4 See Plastic and Composite Intensive Vehicles (PCIVs): An Innovation Platform for Achieving National Priorities, September 8, 2009, http://www.plastics-car.com/pcivs

5 A Safety Roadmap for Future Plastics and Composites Intensive Vehicles, sponsored by the National Highway Traffic Safety Administration, DOT HS 8110 863, November 2007, www.nhtsa.gov/DOT/NHTSA/NVS/Crashworthiness/Vehicle%20Aggressivity%20and%20Fleet%20Compatibility %20Research/810863.pdf

6 “The Safety Characterization of Future Plastic and Composites Intensive Vehicles (PCIVs),” August 2008: a) Workshop prospectus, agenda, and presentations posted at www.volpe.dot.gov/safety/pciv/index.html; http://www.volpe.dot.gov/safety/pciv/docs/summary_pciv_workshop.pdf

Organization: American Iron and Steel Institute (AISI)

Use of Steel in Future Vehicles [Federal Register Vol. 76, No. 231, Pg 74921 et seq.]

New steels and automotive manufacturing techniques continue to be developed by the steel industry and will enable significant increases in mass reduction, crashworthiness and fuel economy, while enabling reductions in total greenhouse gas emissions, during the period specified in the NPRM. [EPA-HQ-OAR-2010-0799-9477-A1, p. 8]

The new regulations will influence car companies to consider mass reduction as a high priority. The steel industry in collaboration with its automotive customers has a long history of providing mass reduction solutions for light-duty vehicles, most recently by developing an evolving portfolio of advanced high-strength steel (AHSS) grades over the past two decades. These steels possess tremendously improved strength over conventional steel and enable parts to be made thinner and lighter while still carrying the required loads. At the May 18, 2011, Great Designs in Steel Seminar, Ducker Worldwide9 reported that AHSS is now the fastest growing automotive material in today's new cars and trucks. From this report and from the reports of individual car companies on specific vehicles, many examples of the effectiveness of AHSS grades in achieving affordable mass reduction for carmakers are available today. Ducker10 also forecasted accelerated growth of AHSS between now and 2025 due to the proposed regulations. This fact emphasizes that, while the growth of AHSS in new vehicles has been significant and averages around 17% of the body mass today, more growth is expected in the future and, according to Ducker, can possibly triple by 2025. [EPA-HQ-OAR-2010-0799-9477-A1, pp. 8-9]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 87-88.]

Much work was necessary to increase AHSS content from essentially zero to the 17% level reported above. It was first made possible because of the global steel industry's ultra-light steel studies, called ULSAB (Ultra Light Steel Auto Body) which were completed in 2002 with the release of the final project, ULSAB-AVC (advanced vehicle concepts)11. [EPA-HQ-OAR-2010-0799-9477-A1, p. 9]

This transition from mild steel to AHSS since 2002 in vehicle structures was also facilitated by joint engineering projects with the Auto/Steel Partnership through support by the U. S. Department of Energy (DOE) and the U. S. Advanced Materials Partnership (USAMP). Important projects including Lightweight Front-end Structure12 and Future Generation Passenger Compartment13 helped to accelerate use of AHSS. Simultaneously, North American steel companies invested in the technologies to manufacture these AHSS grades. [EPA-HQ-OAR-2010-0799-9477-A1, p. 9]

To prepare for anticipated automobile design requirements for 2017- 2025, AISI together with WorldAutoSteel has again conducted a major engineering project, called FutureSteelVehicle14. This study examined the most efficient structures for electrified powertrain vehicles like battery-electric vehicles and plug-in hybrids. Twenty new grades of AHSS were developed, with many of the newest AHSS grades having strengths in the gigapascal range, over 1000 MPa. That's at least 5 times stronger than conventional steels. [EPA-HQ-OAR-2010-0799-9477-A1, p. 9]

FutureSteelVehicle (FSV) results were published in May 2011 and showed mass reduction levels of about 35% in body/structural applications. Such high mass reductions with steel are now possible because of new extremely high-strength grades, new manufacturing processes like tailor rolling or hot stamping, and new design optimization CAE (computer-aided engineering) tools. The FSV results reinforce the forecast by Ducker that AHSS growth in vehicles should continue well past 2020. FSV is an important milestone on the development path of automotive steels—it is not the endpoint. [EPA-HQ-OAR-2010-0799-9477-A1, p. 9]

Technological breakthroughs going forward are sure to enable further advances just as they have over the past two decades. [EPA-HQ-OAR-2010-0799-9477-A1, p. 10]

The results of the FSV study have been shared with North American carmakers. Importantly, it shows that significantly more mass reduction is possible using steels remains. Equally important, this study also evaluates the cost and the carbon emissions consequences of mass reduction solutions. It is significant that AHSS mass reduction solutions are often both the least expensive and the lowest carbon solutions, based on a calculation of life-cycle greenhouse gas emissions. More details on this subject of life-cycle emissions are covered in the first section above. [EPA-HQ-OAR-2010-0799-9477-A1, p. 10]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 89-90.]

Collision Injury Severity [Federal Register vol. 76, No. 231 Pg. 74949 et seq.]

AISI, WorldAutoSteel, and the Auto/Steel Partnership have conducted many studies on the effectiveness of AHSS steels in reducing mass while achieving equal or improved crashworthiness versus established steel architectures. The most notable published studies on this subject are ULSAB-AVC11 (2002), the Auto/Steel Partnership studies on front-end structure12 (2004) and on passenger compartment mass reduction13 (2006), and FutureSteelVehicle14 (2011). All of these studies make use of established vehicle FEA (finite element analysis) models, and computer aided engineering (CAE) crash simulation software. In addition, an actual vehicle crash test was conducted to validate the Auto/Steel Partnership front-end structure project and verify that the AHSS 25% reduced-mass front end behaved equivalently to the original design. [EPA-HQ-OAR-2010-0799-9477-A1, p. 10]

The scope of these steel industry-sponsored studies relied on achieving equivalent or better crash simulation performance with criteria based on limits for intrusion (into the passenger compartment) and management of the intensity of the crash pulse. Our experience in mass reduction is that vehicles can indeed be engineered to achieve equivalent performance at reduced mass against the required battery of crash tests including full frontal impact, offset frontal, rear impact, side impact, roof crush, and others. The properties of AHSS are particularly well suited for this task because of steel's high strength, high work hardening during deformation and strain-rate hardening during impact loading rates. [EPA-HQ-OAR-2010-0799-9477-A1, pp. 10-11]

9 Future Growth of AHSS, Abey Abraham, Ducker Worldwide, May 18, 2011, Great Designs in Steel Seminar, Livonia MI http://www.autosteel.org/Resources.aspx (available on request from Ducker, see www.ducker.com and call 248-644-0086)

10 Light Vehicle Steel Content, Ducker Executive Summary Report, March 2011, (download from www.autosteel.org)

11 ULSAB-AVC Engineering Report (download from http://www.autosteel.org/en/Programs/ULSAB-AVC.aspx)

12 Light-weight Front-end Structure Report, Auto/Steel Partnership Final Report October 2005 (download from http://www.a-sp.org/publications.htm)

13 Future Generation Steel Passenger Compartment, Auto/Steel Partnership Final Report, June 2007 (download from http://www.a-sp.org/publications.htm)

14 Future Steel Vehicle Engineering Report, May 17, 2011, (download from http://www.autosteel.org/Programs/Future%20Steel%20Vehicle.aspx)

15 Technical Report on Fatality Risk, Mass, and Footprint of Model Year 2000-2007 Passenger Cars and LTVs – Preliminary Report, Charles J. Kahane, NHTSA, Docket No. NHTSA-2010-0152-0023, www.regulations.gov

Organization: Bayer Material Science

We support the agencies' decision to consider only net weight reduction of vehicles that will not compromise overall fleet safety. As a supplier of innovative materials such as polycarbonate for vehicle applications such as headlamps, interior consoles and body panels Bayer MaterialScience has a rich history of contributing to automotive safety standards. [EPA-HQ-OAR-2010-0799-9198-A2, p. 1]

Bayer MaterialScience has a rich history for contributing to automotive safety standards and is dedicated to developing innovative, high-performance materials giving automakers a choice of materials when it comes to meeting the CAFE requirements.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 270-271.]

Organization: Center for Biological Diversity

3. The Agencies must decrease weight across all vehicles to improve fuel efficiency

The Agencies correctly identify passenger safety as a factor to be considered in setting fuel efficiency standards. However, less weight does not equate to less safety. The assumption that the safest cars have been heavy and large, and that cars suffering the highest fatality-crash rates have been light and small, has led to incorrect conclusions about reducing vehicle weight. In fact, the evidence shows that weight reductions in all cars will not affect safety, though it significantly improves gas mileage. We urge the Agencies to reexamine their rulemaking and to require greater weight reductions over its effective period. [EPA-HQ-OAR-2010-0799-9479-A1, p. 5]

The Agencies themselves now agree that reducing more mass from heavier vehicles reduces safety concerns for smaller vehicles. They also note that reports they previously relied upon require updating and data correction; accordingly, the Agencies must take updated studies that will be available before the final MY 2017-2025 rulemaking into account in that final rulemaking.24 The Agencies also note the consistency among reported studies that "reducing the overall ranges of masses and mass ratios seems to reduce overall societal harm."25 Indeed, we believe the updated evidence will show that mass can safely be reduced in both light trucks and passenger vehicles as long as wheelbase and track width are maintained.26 Because light weight material can improve vehicle efficiency by 20%, its use must be encouraged. [EPA-HQ-OAR-2010-0799-9479-A1, p. 6]

The erroneous belief that heavier vehicles increase overall safety has contributed to a large increase in the weight of the American vehicle fleet over the last decades – leading to the loss of what could have been highly significant efficiency improvements.27 One study has concluded that from 1984 to 2004, the average weight of light trucks increased by 26 percent and that, if weight, horsepower, and torque had been held at their 1990 levels, fuel economy for both passenger cars and light trucks could have increased by nearly 60 percent from 1980 to 2006.28 The Agencies themselves concede that "MY 2000-2007 vehicles of all types are heavier and larger than their MY 1991-1999 counterparts. The average mass of passenger cars increased by 5 percent from 2000 to 2007 and the average mass of pickup trucks increased by 19 percent." We note that CAFE rulemakings were in effect during all of the referenced period. A correct assessment of the relationship between weight, fuel efficiency and safety must reverse this perverse trend, which is directly contrary to energy conservation. Because of its large impact on fuel efficiency, we urge the Agencies to require significant weight reduction among the vehicle fleet as part of its standards; failure to implement light-weighting across the fleet because of alleged safety concerns would be contrary to the evidence and arbitrary and capricious. These revisions must not simply lead to corrections in the text of the final rule, but also to significant increases in fuel efficiency standards in the final rulemaking. [EPA-HQ-OAR-2010-0799-9479-A1, p. 6]

---

24 The relevant reports include the updated studies from the University of Michigan Transportation Research Institute and Dynamic Research, Inc., referenced at 76 Fed. Reg. at 74,948. See also ICCT Comments in Response to the NPRM, submitted in this docket (Feb.13, 2012) ("ICCT Comments") at 9-13. [EPA-HQ-OAR-2010-0799-9479-A1, p. 6]

25 NPRM, 76 Fed. Reg. at 74,949. See also the studies referenced at 76 Fed. Reg. at 76,957-58. [EPA-HQ-OAR-2010-0799-9479-A1, p. 6]

26 NPRM, 76 Fed. Reg. at 74,950; see report by Dynamic Research, Inc. available in the docket. [EPA-HQ-OAR-2010-0799-9479-A1, p. 6]

27 The lower stringency targets assigned to light trucks is the other driving force of this development, as discussed below. [EPA-HQ-OAR-2010-0799-9479-A1, p. 6]

28 Christopher Knittel, Automobiles on Steroids; Product Attribute Trade-Offs and Technological Progress in the Automobile Sector, AMERICAN ECONOMIC REVIEW 2012 at 3369 (Dec 2011), available at http://www.aeaweb.org/articles.php?doi=10.1257/aer.101.7.3368. The Agencies themselves observe that MY 2000-2007. [EPA-HQ-OAR-2010-0799-9479-A1, p. 6]

Organization: Consumers Union

In fact, reducing vehicle weight will be essential in improving fuel economy. For example, a contemporary family sedan such as the Hyundai Sonata Limited weighs 3,450 pounds and still achieves a Top Safety Pick by the IIHS. The new Toyota Camry XLE V6 is even lighter at 3,375 pounds. These vehicles achieve 25 and 26 overall mpg in CR's testing. By contrast, a similarly equipped Chrysler 200 Limited V6 weighs 3,590 pounds (also a Top-Safety Pick), but with no performance or interior room advantage and partially because of the extra weight only achieves 21 mpg. The new Honda Civic at 2,810 pounds also received a Top Safety Pick and weighs 400 pounds (about 9%) less than the Chevrolet Cruze, a direct competitor, and again achieves 20% better fuel economy partially because of the lower weight. Consumer Reports is confident that lighter vehicles will not necessarily compromise vehicle safety—all vehicles will still need to conform to improving vehicle safety standards. [EPA-HQ-OAR-2010-0799-9454-A2, p.3]

Organization: Insurance Institute for Highway Safety (IIHS)

From a safety standpoint, IIHS is supportive of the proposed CAFE standards put forth by NHTSA in this proposed rule. The continued use of a size-based system will help increase fuel economy while keeping manufacturers from significantly downweighting or downsizing vehicles, and thus will mitigate the safety costs that might otherwise occur as fuel economy increases are required by the federal government. [NHTSA-2010-0131-0222-A1, p. 1]

Organization: International Council on Clean Transportation (ICCT)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 195-196.]

The shift in material design capabilities also impacts the cost to reduce vehicle weight. The studies in progress by Lotus and FEV are using highly sophisticated simulation models to optimize part material and design. The results of these studies will be far more accurate of future designs and they must be used to assess the costs of weight reduction for the final rule.

Organization: Nissan North America, Inc.

Nissan will continue to provide a full range of vehicles, and to incorporate continuous improvements throughout its vehicle fleets. This includes advances in internal combustion engines (ICEs) as well as the continued deployment of electric drivetrains. Nissan also continues to explore appropriate opportunities for mass reduction. A comprehensive mid-term evaluation is critical to determining the extent to which the market accepts the additional costs associated with more advanced internal combustion vehicles, as well as the extent to which the advanced powertrain market develops. In addition, government regulatory programs involving both fuels and safety requirements will directly affect future feasibility and must be considered in any future review. [EPA-HQ-OAR-2010-0799-9471-A1, p.5]

Organization: SABIC Innovative Plastics US LLC

SABIC-IP has been actively engaged in developing solutions to advance fuel economy and reduce greenhouse gas (GHG) emissions. In particular, automotive products made from our polymer resins are used to reduce vehicle mass while providing strong structural integrity. SABIC-IP has also developed an advanced coating solution allowing polycarbonate (PC) glazing to withstand long-term weathering and abrasion conditions. With such coating solutions, PC glazing may be used in areas specified for Item 2 glazing behind the windshield. [EPA-HQ-OAR-2010-0799-9467-A1, p.1]

The agencies are well aware of the emissions and fuel consumption benefits associated with vehicle mass reduction. SABIC-IP supports the inclusion of weight reduction as an available technology, as well as the agencies' ongoing research efforts to quantify better the implications of weight reduction for societal safety measures as lighter and smaller vehicles penetrate into the fleet. SABIC-IP has actively participated in this research, contributing a number of lightweight components, including plastic fenders, plastic front-end modules, polycarbonate glazing for roof and backlight applications, and composite liftgates for evaluation and consideration. Many of these lightweight solutions also offer component-level safety benefits, offering the capability, for example, of mitigating ejections or protecting pedestrians. [EPA-HQ-OAR-2010-0799-9467-A1, p.13]

SABIC-IP verified the traditional estimates that a 10% weight reduction produces a 6-7% increase in fuel economy. In 2008, SABIC-IP arranged for vehicles to be tested at the Mercedes-Benz Research and Development North America, Inc. facility in Ann Arbor, Michigan with two configurations – a vehicle with PC glazing and a vehicle with added weight to simulate the glass penalty due to glass having a mass density about twice that of PC. The data, which SABIC-IP initially presented in our comments to the MY 2012-2016 rulemaking, confirmed these estimates: [EPA-HQ-OAR-2010-0799-9467-A1, p.14] [For the associated table, please refer to EPA-HQ-OAR-2010-0799-9467-A1, p.14]

An additional benefit offered by engineering thermoplastics is the ability to offer enhanced aerodynamics that can be used to design more front and rear ends with a lower coefficient of drag. Drag coefficients for present day vehicles range between 0.30 and 0.35, but an additional 25% reduction in drag has been predicted in coming years. Part of this progress will derive from advances in material science. Injection-molded plastics allow for aerodynamic styling and parts integration not possible with metal or glass. Specific applications where drag coefficient reductions have been or can be achieved include spoilers, fascias, undertrays, grilles, mirrors, and lighting. [EPA-HQ-OAR-2010-0799-9467-A1, p.14]

In fact, engineering thermoplastics can be utilized in the entire front six inches and most of the rear six inches of the vehicle. In the front, these components include lighting (polycarbonate), grills (PC blends), fasciae (polypropylene), bumpers and energy absorbers (PC blends), grill opening reinforcements (polypropylene) and reflectors (polyetherimide). In the rear, the components include structural reinforcements (polypropylene), rear lighting bezels (PC blends), spoilers (PC blends), glazing (polycarbonate), liftgates (polyphenylene ether resin (PPO) and PC blends) and bumpers and energy absorbers. The aerodynamic benefits available through integrated, molded plastic components are likely to contribute substantially as new vehicles are designed with an increasing attention to employing aerodynamics to reduce greenhouse gas emissions and fuel consumption. [EPA-HQ-OAR-2010-0799-9467-A1, p.14]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 286-287.]

In addition to polycarbonate glazing technology, SABIC Innovative Plastics offers a number of other lightweight products that can advance the goals of this rulemaking. In fact, our various plastic products can comprise the entire front six inches and most of the rear six inches of a vehicle, including lights, grills, fasciae, bumpers, energy absorbers, structural reinforcements, liftgates and more. In addition to these familiar mature parts of the car, we have developed products such as the plastic steering wheel which will provide future weight benefits as they're incorporated into vehicle designs. We are also developing composite materials that can reduce vehicle mass and enhance design.

We believe that the technology of lightweight materials will advance substantially in the years covered by this regulation, as will our understanding of the benefits these materials can provide. We look forward to working with our OEM and our Tier customers to determine the most cost-effective and safest ways to incorporate advanced lightweight components and structural elements into the vehicles and components they manufacture.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

A driver in a 2,600-pound Honda Civic has greater chances of surviving an accident a driver in a 5,100-pound Ford F-150 pickup. Most fatal car crashes are single vehicle accidents where weight can be a disadvantage. In fact, the Ford's driver per fatality rate is 65 deaths per million registered vehicle years versus 55 for the 50% lighter Civic. The 3,200 pound Honda Accord is far safer than the F-150 with a driver death rate of only 19. Indeed, the mid-size Accord is safer than any standard large sedan on the road which shows that engineering, not weight, builds safety into a vehicle.35 [EPA-HQ-OAR-2010-0799-9549-A2, p. 10]

With these standards it is important recognize additional steps that will improve safety: [EPA-HQ-OAR-2010-0799-9549-A2, p. 10]

. Future vehicles will comply with new standards for electronic stability (ESC), roof crush resistance, and control of occupant ejection. These standards will substantially reduce the potential for single vehicle crashes (including rollovers) and for injuries in such crashes. [EPA-HQ-OAR-2010-0799-9549-A2, p. 11]

. New applications of high strength steels, laser welding, advanced adhesives, and nonferrous materials (aluminum and plastics) will result in major improvements in structural performance – occupant compartment integrity and crash energy management – with reduced vehicle weight. [EPA-HQ-OAR-2010-0799-9549-A2, p. 11]

Advances in electronics will lead to increased crash avoidance and better crashworthiness as electronic sensors can apply controls to prevent crashes and tune the vehicle for maximum crashworthiness by adjusting seats, head restraints, seat belts and airbags for better occupant protection when a crash is inevitable. Vehicle to vehicle communication systems can send signals to avoid intersection crashes such as when a vehicle runs a traffic light. [EPA-HQ-OAR-2010-0799-9549-A2, p. 11]

A major consequence of the new safety standards will be a dramatic reduction in rollover casualties. Until recently, NHTSA had no significant standards affecting rollover safety. Rollover fatalities increased dramatically as light trucks were increasingly used as substitutes for passenger cars in the 1980s and 1990s. Rollover fatalities will be reduced from the current level of more than 10,000 per year to fewer than 5,000 as a consequence of the new standards. [EPA-HQ-OAR-2010-0799-9549-A2, p. 11]

35 Insurance Institute for Highway Safety, June 9, 2011. [EPA-HQ-OAR-2010-0799-9549-A2, p. 10]

Organization: Society of the Plastics Industry, Inc. (SPI)

Plastics have extensive innovative automotive applications – including bumpers and energy absorbers, consoles, door components, engine covers, housings, instrument panels, lighting, grilles, side impact protection, structural reinforcement and sunroofs – that are critical to safe, lighter weight and more fuel efficient vehicles. [EPA-HQ-OAR-2010-0799-9492-A1, p.2]

From airbags to seatbelts, a wide range of plastics materials and processing methods have played a role in automotive safety. For example, composites can be produced with different levels of reinforcement for specific components to achieve improved mechanical properties that result in enhanced safety. In the event of a crash, backrests and headrests are designed to absorb and distribute energy, and highly elastic films help provide protection from glass. [EPA-HQ-OAR-2010-0799-9492-A1, p.2]

SPI strongly supports the agencies' commitment and approach to consider only vehicle mass reduction that would not have an adverse effect on overall fleet safety. The NPRM notes the historical data suggesting an inverse relationship between vehicle mass and crashworthiness, but also points out that the adoption of advanced lightweight materials has the potential to "mitigate some of the potential decrease in safety from mass reduction through improved distribution of crash pulse energy." The agencies have wisely supported continuing research into the relationship between vehicle mass and crashworthiness at research institutions like George Washington University. [EPA-HQ-OAR-2010-0799-9492-A1, p.4]

Such advances certainly require evaluation for safety. Congress' investment in enhanced automobile safety, through an ongoing partnership between the plastics industry and NHTSA, has led to the initiation and implementation by NHTSA of a Safety Roadmap for Future Plastics and Composites Intensive Vehicles. The 2007 report "summarizes the approach, activities, and results of a study to evaluate the potential safety benefits of Plastics and Composites Intensive Vehicles (PCIVs), to enable their deployment by 2020." The ACC has acknowledged that the commercial viability of PCIVs is a longer term proposition, but research is underway, including the improvement of predictive tools for reliably modeling component performance. We likewise support NHTSA's ongoing work with the Safety Roadmap and industry's research on PCIVs. [EPA-HQ-OAR-2010-0799-9492-A1, p.4]

The plastics industry is proud of its innovations that contribute to vehicle weight reduction, reduced emissions and safety improvements, such as the benefits provided by PC glazing. [EPA-HQ-OAR-2010-0799-9492-A1, p.8]

Organization: Volkswagen Group of America

To start, Volkswagen agrees with the agencies that there is a variation in the overall mass reduction potential based on the type and market segment of vehicles. Smaller cars and economy models have less potential for mass reduction than larger or more premium vehicles. Volkswagen projects full vehicle weight reductions during the time period of this regulation on average in the order of 7-10%. The NPRM predicts for large cars and some trucks upwards of 20% mass reduction potential. Volkswagen feels that this may exceed cost effective limits. With regards to electrified vehicles, Volkswagen does agree with statement sin Section 3.4.5.5. of the TSD that electrical component may increase baseline vehicle mass by upwards of approximately 4-5% depending on battery pack capacity and/or other electric drive components. [EPA-HQ-OAR-2010-0799-9569-A1, p. 15]

Organization: Volvo Car Corporation (VCC)

During the last 30 years, major breakthroughs have been made in the engineering and development of advanced safety technologies. The development, market introduction and penetration of more efficient safety technologies, both with respect to occupant protection and with respect to cost, is expected to continue, with increased intensity. During the next decade, technologies aimed at avoiding or mitigating crashes will be introduced and will achieve widespread implementation in the vehicle fleet. [EPA-HQ-OAR-2010-0799-9551-A2, p. 4]

Regardless of the anticipated development of technologies for improving both the crashworthiness and crash avoidance of vehicles towards the year 2025, the basic laws of physics still apply for incompatibilities in crashes between vehicles of different sizes and different weights. The projection of the effects of the new active safety crash technologies, even though raising a lot of future expectations, is not that crashes will be completely avoided, but that the frequency and impact of many of these crashes will be reduced. The assumptions of necessary weight and footprint reductions for meeting the fuel economy requirements will raise the question: what will be the outcome in a crash between a newer smaller vehicle that meets the requirements with an older larger heavier vehicle? [EPA-HQ-OAR-2010-0799-9551-A2, p. 4]

A smaller and lighter vehicle will be subjected to larger change of velocity than the larger heavier vehicle and, consequently, this will be reflected in the pulse that the smaller vehicle will be subjected to. This is then in turn reflected in the pulse transferred to the vehicle occupants.

Many researchers have been trying to assess the relative injury and fatality risk of occupants in two-vehicle crashes in relation to the differences in mass between the vehicles. Everything else being equal, several of the studies presented indicate a significant increase, up to a factor ten, in the fatality risk for the occupants in the lighter vehicle for a two-to-one weight ratio between the colliding vehicles in a head-on crash. [EPA-HQ-OAR-2010-0799-9551-A2, pp. 4-5]

When trying to assess the consequences of meeting the requirements on reducing the greenhouse gases and the resulting expected changes in the size and mass of the vehicle fleet, a number of uncertainties will arise that make this task very difficult and open for speculation. Will the whole vehicle population move towards lower weight and smaller size or will this only apply to certain segments? What will be the effect on size and weight of new alternative drive trains, e.g. hybrids and electrical vehicles? What will be the technical development of new safety technologies and what will be the market penetration of these systems? What will be the rate of the vehicle turn-over and how many older vehicles, pre 2017, will remain in the vehicle fleet by 2025? [EPA-HQ-OAR-2010-0799-9551-A2, p. 5]

One possible scenario presents a shift of the larger vehicle population towards a mid-segment of the population. This would then result in an overall more compatible passenger vehicle fleet and thus, reduce the negative aspects of the present fleet that has a large spread in weight and size. However, the weight ratio between larger motor vehicles, such as trucks and buses, and passenger cars will most likely increase and this incompatibility will have the opposite effect, i.e. resulting in a higher fatality risk for the car occupants. [EPA-HQ-OAR-2010-0799-9551-A2, p. 5]

Other policy actions may also have consequences on the incompatibilities of the vehicle fleet. For example, changes in crash protection requirements may result in stiffer front structures which in turn will affect the vehicle fleet compatibility. [EPA-HQ-OAR-2010-0799-9551-A2, p. 5]

VCC believes that the development of weight and size compatibilities/incompatibilities should be closely monitored and this should be linked to the development of the number of fatalities and injuries. VCC highly recommends that the midterm review evaluate safety in order to assure that the trend is not in an unfavorable direction and that no other measures are warranted. [EPA-HQ-OAR-2010-0799-9551-A2, p. 5]

Many of the negative consequences, as discussed above, can be avoided or mitigated by efficient active safety technologies. The potential of these systems is to effectively eliminate fatalities and serious injuries in traffic. The development of these systems needs, however, to be gradual and follow a step-wise approach linking technological advances with field experiences from real-life traffic. In order to acquire this knowledge, the penetration of the systems into the vehicle fleet is a key parameter. Some of the technologies have added costs due to advanced hardware and software developments. For customers who are unaware of the benefits of the systems, this added cost will not be attractive and will negatively affect the decision when buying a new car. [EPA-HQ-OAR-2010-0799-9551-A2, p. 5]

It is therefore essential that customers are informed about these benefits. Consumer information, e.g. NCAP (New Car Assessment Program) and the 'Buying a Safer Car' guide should include assessments of the systems and clear statements of the benefits. It should also be reflected on the 'Stars on Cars' statement on the Monroney label. The number of systems included in the assessments and protocols should gradually increase following the technical development. [EPA-HQ-OAR-2010-0799-9551-A2, pp. 5-6]

Response:

As explained in section II.G of the Preamble to the final rule, each agency has outlined a technically feasible compliance path available at reasonable cost and cost-effectiveness which is safety neutral. The total amount of mass reduction used in the agencies' analysis for this rulemaking was chosen based on the agencies' documented assumptions about how much mass reduction is technologically feasible without compromising safety. Overall, technical feasibility paths for manufacturers identified in this rulemaking include a minimal mass reduction, <5%, for the majority of passenger vehicles due to safety restraints identified by NHTSA. Some trucks and CUV's have up to 15% to 20% mass reduction in the projected compliance path which would lessen the impact of crash with these vehicle types. As explained in preamble section II.G, and as noted by a number of commenters (e.g. DRI, CBD), removing weight from heavier vehicles should have a positive effect on vehicle safety.

While EPA has shown a possible compliance pathway using one set of assumptions about the use of mass reduction, there are many alternative pathways for compliance. As discussed in EPA RIA section 3.5, this rulemaking is projected to decrease vehicle mass by approximately 4% (on average) relative to the reference case. Rather than using mass reduction technology, manufacturers could choose to use, for example, additional turbo-charging and downsizing, hybridization, or any other available technology. No manufacturer is explicitly required by this regulation to reduce the mass of their vehicles. Some manufacturers may choose not to reduce mass at all. Others may choose to reduce mass by more than the levels projected here. Using the NHTSA methodology discussed in Section II.G, EPA has shown a compliance pathway that is projected to produce no net additional fatalities.

EPA acknowledges the concerns by the Alliance of Automobile Manufacturers (the Alliance), Nissan North America, Inc., and Volvo Car Corporation regarding the mid-term evaluation areas of focus. The Alliance states their concern over the availability of commercially viable emerging technologies that have been assumed as part of the compliance package for this rulemaking. The Alliance supports the proposed mid-term evaluation and urges EPA and NHTSA to review the technology availabilities as well as continuously update the safety analysis as part of this review, including updating the most recent crash data and revised projections regarding mass reduction scenarios. The Alliance also expressed concerns over the Lotus and Future Steel Vehicle concepts. While these concepts do redesign body in whites in aluminum (Lotus- Toyota Venza) and AHSS (Future Steel Vehicle), EPA is releasing a new mass reduction/cost analyses which applies mass reduction ideas and materials already proven in high volume production vehicles to a Toyota Venza. The information contained in this project may address concerns by the Alliance in regards to CAE modeling with respect to advanced material simulations and material production readiness and applicability. Nissan stated that a midterm evaluation is critical to determine the extent to which the market accepts the additional costs associated with more advanced internal combustion vehicles. This issue will be part of the mid-term evaluation. Volvo highly recommends that the midterm review evaluate safety in order to assure that the trend (of weight and size compatibilities/incompatibilities) is not in an unfavorable direction and that no other measures are warranted. The midterm review will consider these issues.

Volkswagen stated that the NPRM predicts for large cars and some trucks upwards of 20% mass reduction potential. Volkswagen feels that this may exceed cost effective limits. The agencies' basis for estimated costs of mass reduction actually appears to be conservative. As shown in joint TSD section 3, the detailed studies sponsored by the agencies suggest that 20% mass reduction is likely feasible for the rulemaking period using lightweighting materials and manufacturing technologies that have already been adopted in high volume vehicles. See joint TSD pp. 3-238 to 251. The accompanying detailed cost analysis in the joint TSD indicates that the cost of reducing mass by 20% can potentially be economical. See joint TSD section 3.3.5.5. The assumptions for mass reduction costs will be examined during the mid-term evaluation.

The Alliance stated that "it is not sufficient to only consider regulatory and consumer information crash tests. A comprehensive evaluation of vehicle safety must also take into account real-world impact scenarios and the special requirements of vulnerable populations (e.g., children and elderly). These must also be adequately accounted for in any agency policy decisions." Preamble II.G.5.c. states "With respect to NHTSA's looking-ahead approach[1] in assessing the feasible amount of mass reduction and the evaluation of concept vehicles, NHTSA does its best in the fleet simulation study to consider as many real world crash scenarios as possible. In the fleet simulation study, NHTSA is including risk functions for different populations. All of the crash results are weighted for their actual occurrence rates. As stated in NHTSA's 2011-2013 research and rulemaking priority plan,[1] the agency currently has programs looking into the areas of safety for vulnerable occupants. NHTSA will monitor the performance of these vulnerable occupants in the context of the changing fleet in response to the fuel economy program."

The Alliance of Automobile Manufacturers expressed some concerns over how safety can be understood through CAE crash modeling due to modeling limitations compared to actual vehicle crash data. The mass reduction study funded by EPA (FEV/EDAG/Munro) showed the ability to achieve mass reduction through the vast majority use of production proven steel in the BIW, which is the main load bearing unit evaluated in the crash models. Discussion with FEV and EDAG revealed that there are differences between the CAE model and the actual vehicle crash results. However the differences are similar to those within vehicle to vehicle manufacturing differences. EDAG stated that the limitations from CAE modeling include material differences not modeled such as when metal is bent or cross thicknesses that may thinned in production, such as in sheet processing.

The Alliance continues to express concern over the modeling of potential future advanced materials in that "Further, significant uncertainties exist with respect to both manufacturing and CAE crash analysis of potential future advanced materials. CAE capabilities for some potential advanced materials that manufacturers are researching are far less mature than for materials currently in common use. Progress in these areas is highly competitive and therefore varies throughout the industry. As such, it will take considerable time and investment for each manufacturer to develop this knowledge and experience. Because agency projections fail to adequately take into account the timing and cost for the introduction of advanced materials, these projections are likely overly optimistic." [EPA-HQ-OAR-2010-0799-9487-A1, p.22] The materials to which the Alliance is referring in their comment in regards to CAE modeling are not stated. The agencies assume the materials that manufacturers will use in their BIW to reduce mass include HSS, AHSS, aluminum and limited magnesium and these materials have all been modeled. The extent of modeling for composites is unknown, however the use of composites in the BIW is still being researched with applications primarily only on some limited high end vehicles.

As stated at Preamble II.G. 4, "The agencies continue to believe that reasonable conclusions regarding the safety implication of mass reduction can be drawn from CAE simulations. As ICCT stated in their comments, CAE simulations are powerful tools that have improved rapidly over the years in terms of their ability to optimize vehicle designs and predict material and vehicle behavior in real life. Use of these highly sophisticated CAE tools has become standard industry practice in helping to verify and validate designs before real parts and vehicles are built. As the Alliance stated, however, CAE capabilities for conventional materials, such as steel and aluminum, are more mature than those of advanced materials, such as magnesium and composites. Steel and aluminum are the major materials used in some of the studies, such as EPA's and NHTSA's light-weighting studies that determined that a baseline vehicle's mass could be reduced by approximately 20 percent while maintaining safety comparable to the baseline vehicle." In addition, "even though CAE tools are used heavily, the agencies acknowledge the concerns the Alliance raised in its comments about CAE capabilities for some potential advanced materials for crashworthiness, and have been mindful of this issue in developing our studies."

The Center for Biological Diversity expressed the opinion that "the agencies to require significant weight reduction among the vehicle fleet as part of its standards; failure to implement light-weighting across the fleet because of alleged safety concerns would be contrary to the evidence and arbitrary and capricious. These revisions must not simply lead to corrections in the text of the final rule, but also to significant increases in fuel efficiency standards in the final rulemaking." Of course, the standards do not require use of any particular technology. Manufacturers are left to choose their own compliance paths (meeting all applicable federal safety standards in doing so). So the agencies cannot "require" manufacturers to adopt any particular compliance path. As described in detail in preamble section II.G, the agencies have carefully documented potential compliance paths which are safety neutral, and thus do not depend on significant mass reduction from vehicles weighing less than 3,106 pounds.

The International Council on Clean Transportation (ICCT) commented that "the results of these studies (Lotus and FEV) will be far more accurate of future designs and they must be used to assess the costs of weight reduction for the final rule." EPA would have considered the use of the results of these studies if they were completed at the time of the analyses for the final rulemaking. Unfortunately only the draft reports were complete and the peer review responses had not yet been addressed nor the final report completed in time for inclusion of the results into the final rulemaking. These reports will be utilized in the midterm review for this rulemaking to consider the cost curve for mass reduction.

A number of comments were received from companies and associations with information on light weight materials for use in automobiles. Commenters included the Aluminum Association, the American Chemistry Council, Bayer Material Science, SABIC Innovative Plastics, and the Society of the Plastics Industry, Inc. These commenters provide information to support the expectations that plastics and other materials being designed today can be used to make a car lighter in weight, now and in the future. Plastics can be used for the closures, such as the tailgate, and various passenger compartment items such as dash boards and venting piping. The areas containing plastic that are exposed to loads typically have an underlying structure which is load bearing – such as in doors and dash boards. Composites are being designed in high end sports vehicles and are currently too expensive for a high production vehicle. The Aluminum Association states that they believe small vehicle designs will be developed using aluminum body and structural components that will achieve significant weight reduction while preserving vehicle size and improving safety performance. EPA agrees with the commenters that significant advancements have been made in lightweight material technologies, and these developments are likely to continue in the future. As discussed in chapter 3 of the Joint TSD, the agencies believe that manufacturers will be able to meet the MY2017-2025 GHG standards through a combination of efficiency technologies, without relying on a level of mass reduction that requires a dramatic shift to exotic light-weighting materials. Section 14 of the RTC addresses comments urging the agencies to adopt a life-cycle approach whereby manufacturing emissions would be considered along with tailpipe emissions to account for reduced GHG emissions from using advanced materials

13.3. Comments on NHTSA/EPA's Statistical Analysis of Vehicle Safety

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Iron and Steel Institute (AISI)
International Council on Clean Transportation (ICCT)
DRI *(filed its study: "Updated Analysis of the Effects of Passenger Vehicle Size and Weight on Safety" as the comments to the NPRM)*
Wenzel, T.

Organization: Alliance of Automobile Manufacturers

The Alliance supports NHTSA's intention to examine safety from the perspective of both the historical field crash data and the engineering analysis of potential future Advanced Materials Concept vehicles. NHTSA's planned analysis rightly looks backward and forward. However, with respect to looking ahead and the evaluation of concept vehicles, the Alliance recognizes that it is not sufficient to only consider regulatory and consumer information crash tests. A comprehensive evaluation of vehicle safety must also take into account real-world impact scenarios and the special requirements of vulnerable populations (e.g., children and elderly). These must also be adequately accounted for in any agency policy decisions. [EPA-HQ-OAR-2010-0799-9487-A1, p.21]

Organization: American Iron and Steel Institute (AISI)

Collision Injury Severity [Federal Register vol. 76, No. 231 Pg. 74949 et seq.]

However, the effects of mass reduction on a fleet basis, considering collisions of vehicles of unequal mass and of unequal footprint, have not been studied by AISI. We have examined the most recent study by C. J. Kahane15 (NHTSA), published in November 2011. The Kahane findings put a high value on maintaining vehicle footprint. Essentially, the Kahane report suggests that it would be more effective regarding injury performance to improve fuel economy throughout the fleet by reducing mass while maintaining vehicle size, or footprint. In our experience, this is understandable since vehicle collision performance is primarily influenced by crush space, the working distance between the point of impact and the passenger space. Steel structures are particularly effective in absorbing energy during a collision over the engineered crush space (or crumple zone). Preserving crush space in the design of crashworthy vehicles is therefore consistent with our findings in cases where AHSS structures are engineered into equivalent spaces previously occupied by heavier steel structures. [EPA-HQ-OAR-2010-0799-9477-A1, p. 11]

If the Kahane findings on the importance of footprint prove to be true, new AHSS technology has already demonstrated its ability to reduce mass and maintain or improve test crashworthiness performance all within the same vehicle footprint. AISI notes the Kahane study does not dispute or overturn the inherent advantage of heavier vehicles in collisions of vehicles of the same or differing footprints. The study only suggests that if a change is made in a vehicle in order to achieve higher fuel economy, it is better to reduce mass for the same footprint rather than making the vehicle smaller. [EPA-HQ-OAR-2010-0799-9477-A1, p. 11]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 103-104.]

I think in general with regard to safety, we have done quite a bit of research over the last 10 or 15 years in the steel industry. We have proven beyond a doubt that it's very possible to use lighter structures and achieve equivalent test performance on safety.

I think that the new Kahane report is very interesting -- we're still analyzing it, by the way -- and the vehicle-to-vehicle situation is a different story. But I think that in general we don't have any objections to the initial conclusions that were drawn in that study, which really points out the importance of the footprint methodology in defining, you know, your basic vehicle structure.

So, again, steel provides with its high strength varieties the opportunity to reduce the mass in a given footprint, which I think is critically important as suggested in that Kahane study as being probably the primary factor in determining how effectively we can design vehicles to be safe in collisions within the fleet among different size vehicles.

So without changing the laws of physics, I think that this regulation should not have a serious impact on the progress that we're making now on the safety of vehicles on the road.

Organization: International Council on Clean Transportation (ICCT)

3. The use of advanced lightweight materials in smaller cars - or in any vehicle - will not increase fatalities. Analyses by DRI suggest Kahane's results are not robust, likely due to improperly controlled driver, vehicle, environment or accident factors. [EPA-HQ-OAR-2010-0799-9512-A1, p. 2]

Once these factors are appropriately controlled, the effect of weight reduction on fatalities may not be statistically significant. More importantly, high-strength steel and aluminum have better crash properties than the conventional steel used in most vehicles in the historical analysis and their use will reduce fatalities. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

3) Safety

The ICCT appreciates the much improved modeling of safety by NHTSA, in particular the separation of the impacts of size and weight and the inclusion of non-sporty 2-door cars in the analyses. This has addressed many of our comments on safety in response to the 20122016 proposed rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 9]

Despite the improvements, the latest Kahane study, referenced in the proposed rule, still finds that reducing the weight of smaller cars leads to increased fatalities. This issue is important, as the proposed rule assumed that small cars will have zero weight reduction due to the concern with potential fatality increases. The ICCT believes that this increase in fatalities is an artifact of the methodology used by Kahane and that weight reduction using lightweight materials and better vehicle design will reduce fatalities for vehicles of all sizes. [EPA-HQ-OAR-2010-0799-9512-A1, p. 9]

Dynamic Research Inc. (DRI) recently completed a Phase 2 report 4 focused on replicating Kahane's results with the updated 2000-2007 data. They were able to match Kahane's results very closely, indicating that they were able to closely duplicate Kahane's methods and data. The Phase 2 report also conducted analyses using DRI's two-stage method, which separates the fatality impacts into the number of accidents per exposure and the number of fatalities per accident. The two-stage results for lighter passenger vehicles, included in Table 1, below, indicate that the increase in fatalities for lighter vehicles is entirely due to an increase in the number of accidents per exposure. The crashworthiness and crash compatibility of the smaller cars did not contribute to the fatality increase. [Table 1 can be found on p. 10 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, pp. 9-10]

These counter-intuitive results strong suggest that Kahane's methodology has some driver, vehicle, environment or accident factors that have not been controlled for in the current analyses.

Lighter vehicles have theoretical advantages in handling and braking and should be involved in slightly few accidents, not more accidents. From a theoretical view, any increase in fatalities should be due to compatibility issues in crashes with larger vehicles, yet the results do not show any increase in the rate of fatalities once a crash occurs. [EPA-HQ-OAR-2010-0799-9512-A1, p. 10]

DRI also issued a supplemental report,5 which discussed in further detail two key assumptions used in the Kahane report and two alternative assumptions. First, Kahane assumed that the effects of vehicle weight and size can be best modeled using curb weight and footprint. DRI believes it is more appropriate to model weight and size using curb weight, wheelbase, and track width. Wheelbase and track width have different effects on vehicle crashworthiness, crash compatibility, and crash avoidance. These effects are confounded when a single 'footprint' index is used. DRI also found that using footprint and weight had more multi-collinearly than using wheelbase, track width, and weight. As indicated in Table 2, below, the use of wheelbase and track width reduced the number of fatalities associated with weight reduction and the coefficients for all of the vehicle classes are not statistically significant. [Table 2 can be found on p. 11 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 10]

Second, Kahane assumed that the crash exposure is best represented by non-culpable vehicle induced-exposure data. While there are valid reasons supporting the use of non-culpable vehicle induced-exposure data, the DRI report discussed the reasons why it may be better to represent crash exposure using stopped vehicle induced-exposure data: [EPA-HQ-OAR-2010-0799-9512-A1, pp. 10-11]

'Non-culpable vehicle induced-exposure data can include crashes where the nonculpable vehicle was moving prior to the crash. Therefore some drivers may be more likely to be involved in these crashes than other drivers, even if the driver is not culpable in the crash. This is because some drivers may be better able to avoid a crash in which they are not culpable than are other drivers, due to driver skill, driver alertness and/or ability to properly react in time to avoid a collision. Therefore this under-representation in the non-culpable induced-exposure data of good drivers, and over representation of bad drivers, is undesirable and may introduce a numerical bias in the results.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 11]

While the necessary data for evaluating the impacts of wheelbase and track width are in the updated 2000-2007 database, DRI does not yet have stopped-vehicle induced exposure data for the new dataset. Thus, DRI's supplemental report provides a rough evaluation based on the differences that DRI observed in the Phase I regression results using the older data. Assuming that the correlation in the induced exposure estimates in the new dataset will be similar to the correlation in the older data, Table 2 also shows that use of stopped vehicles for induced-exposure data creates a statistically significant reduction in fatalities for weight reduction in larger light trucks and an insignificant increase for the other vehicle classes using footprint and an insignificant decrease in fatalities for the other vehicle classes using wheelbase and track width. [Table 2 can be found on p. 11 of Docket number EPA-HQ-OAR-2010-0799-9512-A1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 11]

DRI's results strongly indicate that the fatality increase seen on smaller cars in Kahane's analysis is not robust and is likely due to improperly controlled driver, vehicle, environment or accident factors. [EPA-HQ-OAR-2010-0799-9512-A1, p. 11]

Further improvements in Kahane's methodology would likely correct the artificial increase in fatalities for reducing the weight of smaller cars and, in any case, high-strength steel and aluminum have better crash properties than the conventional steel used in most vehicles in the historical analysis. Thus, there is no basis to support the idea that using advanced lightweight materials in smaller cars - indeed in any vehicle - will increase fatalities. [EPA-HQ-OAR-2010-0799-9512-A1, p. 13]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 195-196.]

I will just make two quick observations. First, every time Kahane reanalyzes the impact of mass reduction on fatalities, the fatality increase goes down. More importantly, the coefficients in Kahane's modeling reflects the material composition in historical vehicles. This is dominated by conventional steel. This modeling implicitly assumes that lighter vehicles do not change material composition. However, future weight reduction will be accomplished primarily with use of high-strength steel and aluminum, both of which have better crash properties than the standard steel. Their use will improve vehicle crash performance and reduce fatalities, even in small cars. In fact, Honda has moved aggressively towards the use of high strength steel in small cars, in part due to the safety benefits.

---

4 DRI, UPDATED ANALYSIS OF THE EFFECTS OF PASSENGER VEHICLE SIZE AND WEIGHT ON SAFETY, PHASE II: PRELIMINARY ANALYSIS BASED ON 2002 TO 2008 CALENDAR YEAR DATA FOR 2000 TO 2007 MODEL YEAR LIGHT PASSENGER VEHICLES, Volume I: Technical Report DRI-TR-12-01, R. M. Van Auken J. W. Zellner, January 2012 [This footnote refers to Docket number EPA-HQ-OAR-2010-0799-9364-A1]

5 Updated Analysis of the Effects of Passenger Vehicle Size and Weight on Safety: Supplemental Results on the Sensitivity of the Estimates for 2002 to 2008 Calendar Year Data for 2000 to 2007 Model Year Light Passenger Vehicles to Induced-Exposure Data and Vehicle Size Variables. DRI-TM-12-09. R. M. Van Auken J. W. Zellner. February 2012 [This footnote refers to Docket number EPA-HQ-OAR-2010-0799-9365-A2]

6 'Honda Civic Captures AISI Great Designs in Steel Automotive Excellence Award', http://www.theautochannel.com/news/2008/04/09/083742.html

7 2006 Honda Civic Body, Advanced Personal Compact with ACE Body Structure, 2006 Honda Civic Press Information.

8 Edwards, M., Happian-Smith, J., Davies, H., Byard, N., and Hobbs, *A.*, 'The Essential Requirements for Compatible Cars in Frontal Collisions (158)', Proceedings of the 17th

International Technical Conference on the Enhanced Safety of Vehicles, Amsterdam, the Netherlands, 2001.

9 Faerber, E., 'EEVC Research in the Filed of Improvement of Crash Compatibility between Passenger Cars (444)', Proceedings ofthe 17th International Technical Conference on the Enhanced Safety of Vehicles, Amsterdam, the Netherlands, 2001.

10 Delannoy, P. and Faure, J., 'Compatibility Assessment Proposal Close from Real Life Accident (94)', Proceedings of the 18th International Technical Conference on the Enhanced Safety of Vehicles, Nagoya, Japan, 2003.

Organization: Wenzel, T.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 193-197.]

I'm a Research Scientist at Lawrence Berkeley National Laboratory. I appreciate the opportunity to provide comments on the NPRM for this joint rulemaking today. My comments today are mine alone, and I do not represent the views of the U.S. Department of Energy, the Berkeley Lab, or the University of California.

For the last two years I have been under contract with DOE to assist NHTSA and EPA in their analysis of the effect of vehicle mass reduction on safety.

My work has resulted in two studies: an assessment of NHTSA's 2011 regression analysis of U.S. fatality risk per vehicle mile traveled (or VMT), and my own regression analysis of casualty risk per police-reported crash. All three of these studies are available in the public docket with this rulemaking.

My studies agree with NHTSA's conclusion, that the effect of mass reduction on U.S. fatality risk is small and is statistically significant only for lighter-than-average cars.

For lighter-than-average cars, the regression models suggest that a 100-pound reduction in mass would increase U.S. fatalities per vehicle mile traveled by less than 2%.

These results are much smaller than those NHTSA estimated in earlier studies in 1998 and 2003. Other variables that NHTSA included in their regression models have a larger effect on fatality risk than a reduction in vehicle mass.

My analysis by vehicle model indicates that on average, U.S. fatality risk does tend to increase as vehicle mass decreases, except for full-size pickups; societal risk actually decreases as full-size pickups get heavier. This is because of the high risk that full-size pickups impose on drivers of other vehicles.

Although risk increases as mass decreases for other types of vehicles, there is very little correlation between risk and mass for individual vehicle models, even after accounting for differences in other vehicle attributes, driver age and gender, and crash times and locations.

Police-reported crashes can be used to estimate four types of risk: fatality and casualty risk, either per vehicle mile traveled or per crash. Casualty risk includes fatalities plus serious or incapacitating injuries.

My analysis found comparable results in terms of casualty risk per crash to those from NHTSA's analysis of fatality risk per VMT; in most cases, mass reduction resulted in an even lower effect on risk in my analysis than in NHTSA's analysis.

I isolated the two components of fatality risk per VMT: the number of crashes per VMT (or crash frequency), and fatality risk per crash (or crashworthiness).

Crash frequency consistently increases as vehicles get lighter for all types of vehicles. However, mass reduction has only a small effect on fatality risk once a crash has occurred.

In conclusion, the three new analyses suggest the effect of mass reduction on risk is much smaller than NHTSA previously estimated and statistically significant only for lighter-than-average cars.

The agencies should keep in mind that the regression models in the three analyses are not exactly estimating the effect of mass reduction on risk; rather, they are estimating the recent historic relationship between mass and risk after accounting for most measurable differences between vehicles, drivers, and crash times.

In essence, the models are comparing the risk of a 2600-pound Dodge Neon with that of a 2500-pound Honda Civic after attempting to account for all other differences between the two vehicles. The models are not estimating the effect of literally removing 100 pounds from the Neon.

Reduced mass does not inherently decrease vehicle safety; it all depends on where and how the mass is reduced; in short, how mass production is incorporated into the overall vehicle design.

Finally, the agencies should recognize that the results of the three new studies are based on relationship of vehicle mass and footprint on risk for recent vehicle designs. These relationships may or may not continue into the future as manufacturers utilize new vehicle designs and incorporate new technologies, such as more extensive use of strong, lightweight materials and specific safety technologies.

Response:

The principal response to these comments is found in section II.G.2 and 3 of the preamble to the final rule. We supplement those responses briefly here. These comments are from *(1) Alliance of Automobile Manufacturers, (2) American Iron and Steel Institute, (3) DRI,* *(4) ICCT, (5) Wenzel, T.,* DRI and Wenzel's comments are discussed in detail in II. G. 3. h & g of the preamble.

More specifically, ICCT questioned NHTSA's estimated fatality increase for the weight reduction on small cars. ICCT believes that this increase in fatalities is an artifact of the methodology used by Kahane and that weight reduction using lightweight materials and better vehicle design will reduce fatalities for vehicles of all sizes. EPA has looked closely at the issues, and discerns a historical relationship between vehicle mass, size, and safety, including small cars, by most recent safety statistical analysis of historical crash data presented at Preamble II.G.3. As stated in the preamble (II G.3.i), "the agencies expect that the attribute-based standards will likely facilitate the design of vehicles such that manufacturers may reduce mass while maintaining footprint. Therefore, it is possible that the analysis for MYs 2000-2007 vehicles may not be fully representative of the vehicles that will be on the road in 2017 and beyond."

As also stated at the preamble, "we recognize that statistical analysis of historical crash data may not be the only way to think about the future relationship between vehicle mass and safety. However, we recognize that other assessment methods are also subject to uncertainties, which makes statistical analysis of historical data an important starting point if employed mindfully and recognized for how it can be useful and what its limitations may be."

In addition, we believe that we should assess the safety effect on weight reduction by two approaches. One is the statistical analyses approach on historical data to assess societal safety effects. Another is the engineering study approach to assess the ability of individual designs and new material to comply with the FMVSS, and perform well on NCAP and IIHS tests.

DRI filed its new study: "UPDATED ANALYSIS OF THE EFFECTS OF PASSENGER VEHICLE SIZE AND WEIGHT ON SAFETY" as comments to the NPRM. Results of DRI study have been briefly summarized at Preamble II.G.3.g. In the Supplemental report, DRI discussed in further detail two previous key assumptions that were used in the Kahane (2011), Wenzel (2011b), and DRI (2012b) reports, and describes two alternative assumptions. The previous key assumptions were that the effects of vehicle weight and size can be best modeled by curb weight and footprint; and that the crash exposure is best represented by non-culpable vehicle induced-exposure data. The alternative assumptions are that the weight and size can be best modeled by curb weight, wheelbase, and track width; and that the crash exposure is best represented by stopped-vehicle induced-exposure data (because non-culpable vehicle data may under-represent vehicles and drivers that are better at avoiding crashes, even if they would have been non-culpable in those crashes). With alternative assumptions, DRI found that estimated fatality risk due to weight reduction is much smaller than NHTSA's results. The agencies acknowledge these recommendations, and we believe that significant difference between the studies should be closely examined. EPA facilitated technical communications between DRI and NHTSA. In response to the comments, NHTSA has implemented additional sensitivity analysis. The general results of the sensitivity analysis are presented at Preamble II.G. 3. h. The agencies concluded that the difference by DRI's recommendation was within the range of the confidence interval of the estimates, and NHTSA's primary results should be used for the relationship between mass and safety.

In his comment, Wenzel points out that although his study agrees with NHTSA's conclusion, "there is very little correlation between risk and mass for individual vehicle models, even after accounting for differences in other vehicle attributes, driver age and gender, and crash time and location". In more detail, Wenzel's Phase 1 and Phase 2 reports show that when fatality or casualty rates are aggregated at the make-model level, differences between the models "overwhelm" the effect of mass. Likewise, in the basic regression analyses, the effects of many control variables are much stronger than the effect of mass. EPA acknowledges Wenzel's results and believes that Wenzel's findings are important, and it provides a relative comparison in evaluating risk factors between mass and other variables used in the regression. NHTSA indicates it does not dispute the validity of these analyses or disagree with these findings. However, as it stated at Preamble II G. 3.h, NHTSA believes these results must not be misinterpreted. Specifically, it would be wrong to conclude that the effect of mass reduction should not be estimated at all because other ambient effects are considerably stronger.

14. Treatment of Life-Cycle Emissions Related to Vehicle Manufacturing

Organizations Included in this Section

Aluminum Association's Aluminum Transportation Group
American Chemistry Council (ACC)
American Iron and Steel Institute (AISI)
Center for Sustainable Systems, University of Michigan
Kendall, A.
Society of the Plastics Industry, Inc. (SPI)
United States Steel Corporation
United Steel Workers (USW)
World Resources Institute (WRI)
World Steel Association
WorldAutoSteel

Organization: Aluminum Association's Aluminum Transportation Group

Support for the Revision of Regulation (EC) No. 443/2009 on CO_2 Emissions from Cars

In our comments to the NOI on this rulemaking in October 2010, we noted the agencies' attempt to examine the life cycle costs of owning and operating a vehicle in conjunction with the costs and benefits of increasing CAFE standards. Since that time, a new life cycle analysis commissioned by the European Union has concluded that improvements in the use phase of vehicles are found to more than outweigh additional emissions from the manufacturing phase. More specifically: [NHTSA-2010-0131-0226-A1, p. 3]

"Changes in vehicle technologies not only affect the CO_2 emissions in the use phase, but many also lead to changes in the GHG emissions occurring in other stages of the vehicle's life cycle, specifically the manufacturing of materials and components, vehicle manufacturing and vehicle disposal and recycling. [NHTSA-2010-0131-0226-A1, p. 3]

For the CO_2-reducing technologies that are expected to be applied to conventional vehicles in response to CO_2 legislation the emission improvements in the use phase are found to more than outweigh additional emissions from the manufacturing phase. Application of light weight materials is found not to increase CO_2 emissions from vehicle production." [NHTSA-2010-0131-0226-A1, p. 3]

A copy of this quoted portion of the analysis is attached as Attachment C [see Docket number NHTSA-2010-0131-0226-A3]. [NHTSA-2010-0131-0226-A1, p. 3]

Life Cycle Assessment Study – Magnesium Front End Research Development

A 2010 life cycle CO_2 study by the Magnesium Front End Research Development (MFRED) project found that aluminum has the smallest overall carbon footprint for total life cycle emissions compared to competing materials including steel. A copy of the complete MFRED project is attached to these comments as D [see Docket number NHTSA-2010-0131-0226-A6]. [NHTSA-2010-0131-0226-A1, p. 3]

We obviously were pleased to see in the agencies' Draft Environmental Impact Statement that the agencies agree with the above conclusions, as evidenced in the statement from the conclusions section of that document: [NHTSA-2010-0131-0226-A1, p. 3]

"Aluminum and high-strength steel material substitution are both effective at reducing life-cycle energy use and GHG Emissions (i.e. the increased energy use and GHG emissions at the vehicle production stage are offset by the use-phase savings over the vehicle life)." [NHTSA-2010-0131-0226-A1, p. 3]

Organization: American Chemistry Council (ACC)

(6) The focus of the rulemaking is properly on tailpipe emissions during vehicle use phase.

ACC strongly supports the use and evaluation of well-developed, comprehensive, and complete life cycle analysis tools for materials and products consistent with International Organization for Standardization (ISO) Life Cycle Assessment standards. That said, the primary purpose of this rulemaking is directed at federal greenhouse gas and fuel economy standards, and NHTSA must develop its standards in accordance with Energy Policy and Conservation Act (EPCA) criteria. These criteria do not directly include life cycle considerations of the materials used in automobile construction. [EPA-HQ-OAR-2010-0799-9517-A2, p.6]

We believe the agencies' focus in this rulemaking – on increasing vehicle fuel economy and tailpipe emissions as a source of greenhouse gas emissions – is well supported by statutory imperatives, and also prudent. As the Environmental Protection Agency (EPA) notes, mobile sources emitted (through tailpipe emissions) 31 percent of all U.S. GHG emissions in 2007 and have been the fastest-growing source of U.S. greenhouse gas emissions since 1990.27 Certainly other phases of the product life of an automobile contribute GHG emissions, from materials manufacture, to employees commuting to the auto manufacturing job site, to container, rail and road shipment of vehicles after their manufacture, and so forth. But emissions during these other phases are nonetheless a fraction of GHG emissions during the operational or use phase of a vehicle,28 and the use phase of the vehicle is responsible for emissions of 80-90 percent of life cycle GHGs.29 LCA data consistently demonstrates that GHG savings in the use phase from using plastics to reduce weight in transportation (e.g., reducing shipping weight of goods, or weight of the vehicle used to transport people or goods) significantly outweigh GHG creation in other phases of the life cycle. A report comparing two LCA approaches and considering both a plastic fuel tank and a steel fuel tank, for example, confirms the fundamental observation relevant to automobiles – that "use phase impacts dominate total life-cycle energy use and life-cycle conventional pollutant emissions."30 [EPA-HQ-OAR-2010-0799-9517-A2, pp.6-7]

Regulatory measures addressing reduction of emissions during vehicle use phase are thus the most effective way to reduce GHGs.31 Some have argued that material-based Life Cycle Analysis (LCA) should be considered, but it does not factor into the rulemaking here. Further, this type of rulemaking is not an appropriate place to apply LCA because of the lack of consensus regarding how to calculate inputs and outputs in an LCA evaluation at this time. With respect to any future policy changes, the use of LCA can play a role, but should be evaluated carefully. LCA is very useful tool, but it cannot itself be dispositive of public policy, a fundamental point for future consideration, in part because it may inadequately address human preferences and behavior (e.g., auto selection, operation, length of ownership, and other factors); costs, job creation, and other issues important to sound policy development. [EPA-HQ-OAR-2010-0799-9517-A2, p.7]

---

28 See, e.g., C. Samara and K. Meisterling, "Life Cycle Assessment of Greenhouse Gas Emissions from Plug-in Hybrid Vehicles: Implications for Policy," Environ. Sci. Technol., 2008, 42 (9), 3170-3176, available at http://solar.gwu.edu/index_files/Resources_files/LCA_for_PHEVs.pdf ("The majority of vehicle life cycle energy use and GHG emissions result from powering the vehicle with liquid fuel or electricity.")

29 WorldAutoSteel, Life Cycle Greenhouse Gas Emission Assessments of Automotive Materials: The Example of Mild Steel, Advanced High Strength Steel and Aluminum in Body in White Applications, December 7, 2007, http://www.worldautosteel.org/Projects/LCA-Study/UCSB-LCA-Study.aspx

30 S. Joshi, "Product Environmental Life-Cycle Assessment Using Input-Output Techniques," 3 Journal of Industrial Ecology 2&3, 2000, https://www.msu.edu/~satisJIE%20article-joshi-published.pdf

31 See M. V. Chester and A. Horvath, Department of Civil and Environmental Engineering, University of California, "Environmental assessment of passenger transportation should include infrastructure and supply chains," Environ. Res. Lett. 4 (2009), ("The dominant contributions to energy consumption and GHG emissions for onroad and air modes are from operational components. This suggests that technological advancements to improve fuel economy and switches to lower fossil carbon fuels are the most effective for improving environmental performance.")

Organization: American Iron and Steel Institute (AISI)

Requested Action

AISI argues below, based on referenced studies from around the world, that future vehicle regulations should be based on life-cycle emissions in order to ensure a net reduction in emissions from light-duty vehicles. To accomplish this, considerable collaboration is necessary among car companies, regulators and suppliers to establish the methodology for fairly accounting for life cycle emissions in vehicle regulations. [EPA-HQ-OAR-2010-0799-9477-A1, p. 1]

The steel industry recommends the formation of an advisory committee among EPA, NHTSA, automakers and suppliers to address this important challenge in time for the 2018 mid-term review with the goal of incorporating life cycle emissions into vehicle regulations for model years 2022-2025. [EPA-HQ-OAR-2010-0799-9477-A1, p. 2]

Accordingly, we suggest 40 CFR sec 86.1818-12 be amended as follows: [EPA-HQ-OAR-2010-0799-9477-A1, p. 2]

(1) Strike "and" in clause (h)(1)(vii) and insert after clause (h)(1)(vii) the following: "(viii) The Life-cycle Assessment Report required in paragraph (i) of this subsection; and"

(2) Strike "and" in clause (h)(2)(iii) and insert after clause (h)(2)(iii) the following: "(iv) The Life-cycle Assessment Report required in paragraph (i) of this subsection; and"

(3) Insert after subparagraph (h)(3) the following:

"(4) No later than November 15, 2017, the Administrator shall issue a draft assessment of the Life-cycle Assessment Report addressing all issues relevant to the inclusion of a materials life-cycle metric in standards for the 2022 through 2025 model years."

(4) Insert after paragraph (h) the following new paragraph:

"(i) Life-cycle Assessment Report. "No later than 1 year following the publication of this regulation in the Federal Register, the Administrator shall establish an advisory committee to evaluate current scientific and technical information regarding life-cycle assessment of the greenhouse gas emissions of materials used in the construction of motor vehicles. The advisory committee shall consist of representatives from the Environmental Protection Agency, the National Highway Traffic Safety Administration, automakers, suppliers to automakers and other qualified individuals with expertise in life-cycle assessment and materials used in motor vehicles. The advisory committee shall be required to issue a report by December 31, 2016. The report shall:

"(1) Address how the life-cycle greenhouse gas emissions of various materials used or planned for use in the construction of motor vehicles can be practically quantified.

"(2) Describe appropriate calculations and data sources that can be used to determine the life-cycle greenhouse gas emissions of various materials; and

"(3) Propose how a materials life-cycle metric can be incorporated within standards for motor vehicles in model years 2022-2025."

Life-cycle Greenhouse Gas Emissions

Studies at many universities including research by Roland Geyer at the University of California at Santa Barbara1 (UCSB) and by Gregory Keoleian at the University of Michigan2 have validated the use life cycle assessment (LCA) principles in determining the true impact of vehicles on total greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-9477-A1, p. 4]

Building on this base, further LCA case studies compiled by Geyer at UCSB (Sun to Wheels Study3) and Ricardo (Preparing for a Life Cycle CO_2 Measure4) show that such materials and manufacturing-related emissions are likely to grow from 15% of total emissions (today) to 50% or more by 2020 as vehicles become more fuel efficient. A tailpipe-only rule which ignores 15% of total emissions (today's situation) is much less problematic than one that ignores 50%. [EPA-HQ-OAR-2010-0799-9477-A1, p. 4]

This scenario was specifically examined by Alissa Kendall at University of California at Davis5 (UC-Davis). Dr. Kendall examined the consequences of continuing to apply tailpipe-only (that is, driving cycle only) regulations and excluding some of the critical other sources of GHG emissions such as occur during materials manufacturing. [EPA-HQ-OAR-2010-0799-9477-A1, p. 4]

A specific example given in the UC Davis study shows the potential consequences of continuing tailpipe-only regulations, i.e., that total vehicle emissions may increase. Kendall's evaluation of a modeled future Toyota Venza6 showed how emissions from the use of low density materials, as labeled in Figure 1 [See Figure 1, Comparison by Kendall of Vehicle Life cycle GHG Emissions from Lotus Study of Toyota Venza, at docket number EPA-HQ-OAR-2010-0799-9477-A1, p. 5.], can account for about 40% (17.3 mt CO_2 eq /43.8 mt CO_2 eq) of total emissions (lowest bar, 11 year life, in Figure 1). Also, it is clear that total emissions for the AHSS version for both 11 year and 16 year life spans are lowest. In this example, differences in materials emissions outweigh differences in driving emissions. [EPA-HQ-OAR-2010-0799-9477-A1, p. 4]

While the importance of life-cycle emissions in future vehicles has been clear in AISI case studies, UC Davis examples, and other academic research, it is important to note other organizations, such as Ricardo, mentioned above, Toyota7, Mercedes and domestic original equipment manufacturers (OEMs) are using LCA as an important tool to understand and manage all aspects of vehicle-related emissions. [EPA-HQ-OAR-2010-0799-9477-A1, p. 5]

One objection often raised regarding the use of life cycle principles in regulations is the perceived complexity. This is a concern to car manufacturers because of the large number of parts used to manufacture vehicles and the large number of suppliers in the supply chain. While specific details must be worked out, research by Kendall suggests that a bill-of-materials (BOM) approach, much like that used by Mercedes8 in its LCA calculations and development of Environmental Certificates for its vehicles, represents a simple approach. [EPA-HQ-OAR-2010-0799-9477-A1, p. 5] [EPA-HQ-OAR-2010-0799-9477-A1, p. 5]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 90-92.]

A schematic of the process for using the BOM for LCA calculations in a vehicle is provided in Figure 2. [See Figure 2 at docket number EPA-HQ-OAR-2010-0799-9477-A1, p. 6]

The flow diagram in Figure 2 could establish a life cycle emissions reference point based on vehicle footprint by: [EPA-HQ-OAR-2010-0799-9477-A1, p. 6]

1. Starting with 2018 vehicles of specific footprints and determining use-phase emissions in the current, tailpipe method, then expanding the approach by acquiring BOM data for the same vehicles.

2. Translating the BOM into life cycle emissions using Argonne National Lab's GREET model, or equivalent and using Oak Ridge National Lab's "Transportation Energy Data Book," or equivalent, for vehicle lifetime miles, a critical input to the GREET life cycle emissions calculation.

3. Using known CO_{2e} equations to establish a footprint-based reference for 2022 vehicles by adding the materials-related life cycle emissions to the use-phase emissions, creating a realistic total emissions limit. This is shown in Figure 3. [See Figure 3 at docket number EPA-HQ-OAR-2010-0799-9477-A1, p. 7]

In the example above, the line entitled "2022 LCA reference" represents a "shift up" of the car curves to account for life cycle emissions using existing BOM data. Please note this is one approach and is intended to show only the feasibility of life cycle based regulations. It is likely that other methods may be possible. [EPA-HQ-OAR-2010-0799-9477-A1, p. 7]

LCA methods are the most straightforward way to account for total emissions. Life cycle emission data exist today for automotive materials as do models for calculating life cycle emissions of vehicles; this is vitally important as materials will carry with them their emissions factors just as they do their strength, density, thickness, etc. The important task is to consider how these data and models can be used in future regulations and to use the time available between now and the proposed 2018 mid-term review to prepare regulations which will ensure a net reduction in emissions from light-duty vehicles. [EPA-HQ-OAR-2010-0799-9477-A1, p. 7]

In summary, AISI emphasizes the following points.

1. As vehicles become more fuel efficient, materials manufacturing emissions will become an increasingly larger contributor to total life cycle emissions to the point they cannot be ignored. Many studies indicate this will begin to occur around 2020.

2. A continued focus on tailpipe-only regulations may lead to an increase in total emissions from light-duty vehicles

3. LCA principles and materials life cycle data are well known and should allow regulators to introduce life-cycle emissions-based regulations by the time such regulations are needed, around 2022. [EPA-HQ-OAR-2010-0799-9477-A1, p. 8]

1 Comparative LCA Model, Roland Geyer, UCSB (download from http://www.worldautosteel.org/Projects/LCA-Study/2010-UCSB-model.aspx)

2 Various reports on use of LCA methodology, University of Michigan, Center for Sustainable Systems, Greg Keoleian,(download from http://css.snre.umich.edu/publications/all)

3 Photovoltaics Offer Low-Carbon Sun-to-Wheels Transportation without Energy Sprawl, Roland Geyer and David Stoms (UCSB Bren School) and James Kallos (Norwegian University of Science and Technology, November 4, 2010, (download from http://lcacenter.org/lcax/presentations-final/172.pdf)

4 Preparing for a Life Cycle CO_2 Measure, A Ricardo Engineering Report released by Low Carbon Vehicle Partnership, August 25, 2011 (download from http://www.lowcvp.org.uk

5 Life Cycle Greenhouse Gas Emissions Standards for Passenger Vehicles – The Policy Context, Alissa Kendall, Ph. D., and Lindsay Price, University of California, Davis, December 30, 2011

6 An Assessment of Mass Reduction Opportunities for a 2017-2020 Model Year Vehicle Program, Lotus Engineering Inc., The International Council on Clean Transportation. (2010)

7 Steps Towards Sustainable Mobility, Bill Reinert, Toyota Motor Sales, May 7, 2007, (download from http://www.discovery.org/scripts/viewDB/filesDBdownload. php?command=download&id=1345.

8 Environmental Certificate Mercedes Benz C-Class http://www.daimler.com/dccom/0-5-1312394-1-1312442-1-0-0-0-0-0-16158-0-0-0-0-0-0-0-0.html

Organization: Center for Sustainable Systems, University of Michigan

Due to the various sources of GHG emissions from electrified vehicles, we feel that a life-cycle approach should be considered in order to best evaluate and set standards for all vehicle technologies. This is particularly important for EVs since the GHG emissions are upstream, while the majority of the emissions for CVs is due to combustion of fuel during vehicle operation. A life-cycle approach, to evaluating vehicle emissions, would fully account for emission sources due to upstream, vehicle operation and vehicle production life-cycle phases. Furthermore, lifecycle analysis would allow for analogous comparisons between vehicle technologies to ensure that the overall light-duty vehicle GHG emission reductions are realized. [EPA-HQ-OAR-2010-0799-9493-A1, p.2]

Regional variation in GHG intensity of electricity, as pointed out in Section III-C-2 of the proposed 2017-2025 rule, is also an important consideration which should be addressed in vehicle standards. As part of the U.S.-China Clean Energy Research Center for Clean Vehicles, we have conducted research on the total life-cycle GHG emissions from conventional and electrified vehicles using a total vehicle life-cycle (or cradle-to-grave) approach, the results of which are currently in review.3 Our analysis of a representative midsize plug-in hybrid vehicle has shown that there is over a 100 gram per mile GHG emissions variation between vehicles charged in the lowest and highest GHG intensive North American Electric Reliability Council (NERC) regions (based on an assumption of 63.5% utilization of electric mode). Our analysis showed that the Midwest Reliability Council and Southwest Power Pool North American Reliability Council (NERC) regions showed higher life-cycle GHG emissions in electric mode than for gasoline mode. Our results further showed that this difference is even greater for a representative battery electric vehicle, with a difference of over 150 life-cycle GHG grams per mile. These results highlight the importance of a life-cycle approach. [EPA-HQ-OAR-2010-0799-9493-A1, p.2]

We recognize the difficulty in instituting a life-cycle framework into the proposed GHG standards since this type of analysis has not been applied to vehicle standards in past rules. To account for the difficulty in incorporating all vehicle life-cycle stages in the standards we recommend incorporating life-cycle stages as reliable data and methodology becomes available. For instance, data on the upstream GHG emissions from electric power plants is available from sources such as EPA's eGrid database.4 Vehicle production life-cycle data for specific vehicles is less established, although frameworks such as Argonne National Laboratory's GREET Vehicle Cycle model, do exist.5 By adding in these other emission sources, which result from a significant portion of vehicle emissions shifting upstream, an inclusive approach will result in a more complete and robust standard. [EPA-HQ-OAR-2010-0799-9493-A1, p.2]

Since the contribution of GHG emissions to climate change is the same regardless of the source location, we feel that only a complete vehicle life-cycle regulatory approach will result in the necessary emissions reductions from the U.S. vehicle fleet. We would be pleased to provide more detail regarding our recent analysis of life-cycle GHG emissions for electrified vehicles. Please contact Dr. Keoleian by email at gregak@umich.edu or by phone at 734-764-3194. [EPA-HQ-OAR-2010-0799-9493-A1, pp.2-3]

---

3 - MacPherson, N. D., Keoleian, G. A., Kelly, J. C. (2012). 'Fuel Economy and Greenhouse Gas Emissions Labeling for Plug in Hybrid Vehicles from a Life Cycle Perspective.' Journal of Industrial Ecology. In review.

4 - EPA. (2011). "eGRID 2010." EPA.

5 - Wang, M. (2007). GREET 2, Version 2.7, Argonne National Laboratory.

Organization: Kendall, A.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 166-170.]

I hope my comments today will demonstrate that the EPA should continue advancing research by extending its scope of analysis from the tailpipes to the life cycle, including upstream impacts of materials and vehicle technology.

Previous life cycle assessments of passenger vehicles estimated use-phase emissions constitute 85 to 95 percent of life cycle greenhouse gas emissions. So standards that address fossil fuel consumption through fuel economy standards or CO_2 from the tailpipe have functioned to successfully limit or reduce life cycle emissions and will probably do so in the near future as well.

However, two trends suggest that tailpipe-only standards could miss important tradeoffs in technology and design decisions in the future. The first trend is that many technologies that reduce greenhouse gas emissions during operation increase emissions during production. This has been shown for advanced materials used in mass production and also electric power train. The second trend is that when we use reduced greenhouse gas emissions during vehicle use, the relative importance of production-related emissions increases. These trends have been highlighted previously including in the NHTSA draft Environmental Impact Statement and a recent CARB report for their advanced Clean Cars program.

EPA's greenhouse gas emission standards and NHTSA'S CAFE standard are performance-based, allowing for flexibility in how vehicle producers achieve compliance. They can select from an enormous range of technologies and innovations, each of which have unique upstream burdens associated with them. This means that among future vehicles, there may be significant differences in upstream emissions. And if upstream emissions are significant enough, there's a potential for vehicles with lower tailpipe emissions but higher life cycle emissions to be favored.

We undertook research to address these issues. The research was funded by the AISI and the World Auto Steel organization and with additional support from U.C. Davis, the U.C. Davis Institute of Transportation Studies. A summary of our research and findings is currently undergoing peer review in a scholarly journal.

Using a case study approach, we undertook a streamlined LCA for a future vehicle and tested whether tailpipe-only standards could result in the preference for vehicles with lower use-phase emissions but higher life cycle emissions. We used a vehicle designed -- developed in Lotus Engineering 2010 report, a model year 2020 [sic] Toyota Venza. Lotus redesigned the Venza for improved fuel economy while meeting predefined cost constraints and targets for equivalent consumer performance. They did this through light-weighting and power train actions such as hybridization. The high-development vehicle described in Lotus's report was the basis for our model.

To perform the LCA, we connected the bill of materials generated by computer-aided engineering software to life cycle inventory data. Life cycle inventories characterize the upstream emissions associated with material production and forming processes. Using this approach, we found the use phase responsible for 71 to 76 percent of life cycle emissions, which aligns with many previous studies of advanced power train vehicles.

We also performed a variation on the analysis where we altered Lotus's high-development vehicle by replacing the lightweight body structure with one that was 100 kilograms heavier. This was referred to as the low-development structure in the Lotus report. This heavier body structure eliminated some carbon-intensive lightweight materials, primarily magnesium and some aluminum. These materials were replaced with mild and advanced high-strength steel. The change in vehicle weight led to a decrease in fuel economy of 3 miles per gallon, which in turn increased CO_2 emissions during operation. Despite these increased emissions during vehicle use, the new design reduced total life cycle emissions by a significant amount, which approximated to 10 to 20 grams of CO_2 equivalent per mile, depending on vehicle service life.

To put this in perspective, the difference in emissions between the two designs is greater than any of the off-cycle credit provisions and similar in magnitude to many of the air-conditioning credits that the EPA has already considered in its rulemaking.

Our research process also demonstrated that by using the detailed bill of materials generated in computer-aided engineering software, we could produce a streamlined LCA quite efficiently. Since computer-aided engineering tools are widespread in the automotive industry, conducting LCAs may be less burdensome than anticipated.

To summarize, our analysis suggests that there is a potential for a tailpipe-only CO_2 standard to favor vehicles with higher life cycle emissions over those with lower life cycle emissions, shifting greenhouse gas emissions from the tailpipe to production sites. Continued research in tracking of upstream emissions for future vehicles may help manage the risk of selecting vehicle design and technologies where upstream emissions overwhelm use-phase savings. In addition, including upstream emissions in the standard could provide vehicle producers with an additional degree of flexibility to achieve CO_2 production.

Organization: Society of the Plastics Industry, Inc. (SPI)

Life Cycle Analyses of Plastics Demonstrate Favorable Environmental Performance [EPA-HQ-OAR-2010-0799-9492-A1, p.7]

SPI recognizes that the criteria contained in the Energy Policy and Conservation Act (EPCA), by which NHTSA must develop its standards, do not directly address life cycle considerations of the materials used in automotive vehicles. As a result, information on energy use during production of plastics and their chemical feedstocks, along with data on recyclability, are not directly relevant to this rulemaking. However, available information provides support for the life-cycle performance of plastics and related materials. [EPA-HQ-OAR-2010-0799-9492-A1, pp.7-8]

Compared to their alternatives, many plastic products require less energy for production, especially for use in automotive parts. Given that the use phase of a vehicle accounts for 80-90% of the life cycle GHG emissions, it would seem that regulatory measures that aim to reduce emissions during this phase where technologically feasible would be the most effective way to reduce vehicle GHG emissions. This is further supported by LCA data which demonstrates a net savings in GHG emissions when the weight reduction in the use phase is compared to the creation of GHGs elsewhere in the life cycle for the plastic components used, such as with fuel tanks. However, while it is an informative and useful tool, we share the caution and concern expressed by the ACC with the use of LCA in public policy applications given the inherent subjectivity and limitations. [EPA-HQ-OAR-2010-0799-9492-A1, p.8]

Organization: United States Steel Corporation

CAFE was initiated in 1975 in the wake of the 1973 Oil Embargo with the objective reducing dependence on foreign oil. That program adopted miles per gallon, measured in equivalent tailpipe grams of CO_2 per mile, as the metric to achieve reductions in oil consumption. It was the right approach to achieve the stated objective. [NHTSA-2010-0131-0256-A1, p. 1]

However, extending that same metric toward the new objectives of reduction of energy use and greenhouse gas emissions associated with vehicles will not achieve the intended outcome, but in contrast will result in increased total energy use and CO_2 emissions. In fact, the magnitude of these unintended consequences will increase as the fuel economy and grams of CO_2 per mile become more stringent between now and 2025. [NHTSA-2010-0131-0256-A1, p. 1]

These comments requests the EPA and NHTSA to accomplish a technical assessment of the feasibility of incorporating Life Cycle principles into regulation in support of the anticipated 2018 mid-term evaluation that will lead to an informed final agency action. Attachment 1 provides a more detailed analysis of this argument as well as the sources of references supporting documents. [NHTSA-2010-0131-0256-A1, p. 1]

To explain, a vehicle consumes energy and emits CO_2 during all phases of its life which includes manufacturing, driving, and end of life disposal. Considering all phases of a vehicle's life accurately measures its true carbon footprint. [NHTSA-2010-0131-0256-A1, p. 2]

In today's vehicles, the driving phase CO_2 emissions represent 85 percent of a vehicle's total carbon footprint arguably justifies allowing regulators to ignore the other phases of impact. However, as the fuel economy requirements double from 27.5 mpg today to 54.5 mpg in 2025, the driving phase emissions will be cut in half, thus increasing the importance of other vehicle life phases. Also, consider that many of the technologies (and materials) necessary to achieve these fuel economy improvements are energy and CO_2 intensive in the manufacturing phase and will increase the vehicle manufacturing phase CO_2 emissions, altering end-of-life impact in both relative and absolute measures. [NHTSA-2010-0131-0256-A1, p. 2]

Several recent studies demonstrate that vehicles aiming to achieve the future fuel economy and tailpipe emissions targets will have a 50-50 split between CO_2 emissions associated with the driving phase and other phases. Under the proposed regulations 50 percent or more of the total CO_2 emissions associated with these future vehicles will fall outside of the regulation. [NHTSA-2010-0131-0256-A1, p. 2]

Many of the technologies required to achieve the proposed 54.5 miles per gallon target have high manufacturing emissions. Examples of this are materials that compete with steel, such as aluminum, magnesium, and carbon fiber, which are six to twenty times more energy and carbon intensive to produce on a pound per pound basis than steel. While these materials may improve fuel economy and tailpipe CO_2 emissions in the driving phase, those improvements are not sufficient to offset the upstream CO_2 emissions associated with producing these materials. [NHTSA-2010-0131-0256-A1, p. 2]

To address these unintended consequences and achieve optimal environmental resource allocations, future regulations should evaluate the CO_2 emissions associated with all of the vehicle's life. This will ensure that technologies are not deployed that improve driving phase emissions while increasing a vehicle's overall carbon footprint. In this regard, we have been working with the EPA and NHTSA over the past several years to consider a more appropriate methodology which resulted in the section III.G.5 of the NPRM requesting additional information on this topic, for which U. S. Steel would like to thank and commend the EPA and NHTSA for their open mindedness on this issue. [NHTSA-2010-0131-0256-A1, p. 2]

There are other advantages to a vehicle CO_2 regulatory approach that incorporates life cycle principles over the current tailpipe emissions approach beyond the obvious advantage of actually achieving the intended outcome of reduced energy use and CO_2 emissions. [NHTSA-2010-0131-0256-A1, p. 2]

First, such an approach can enable vehicle makers with increased design flexibility in complying with the regulations which will result in lower cost vehicles and improved environmental performance. Vehicle makers have provided examples where the lowest life cycle CO_2 technology solution is also the low cost solution. In contrast, these examples also demonstrate that selection of the technology to improve fuel economy and tail pipe emissions alone would have resulted in increase manufacturing costs while increasing the carbon footprint of the vehicle. Regulations that drive vehicle makers toward solutions that increase cost and total carbon emissions do not make sense. Regulation that incorporates life cycle thinking will address such unintended consequences. [NHTSA-2010-0131-0256-A1, pp. 2-3]

A second advantage is that it would drive the vehicle supply chain to reduce the carbon intensity of their products because of the commercial advantage it would provide them. That is low carbon suppliers would provide a competitive advantage to their customer, the vehicle manufacturer, in complying with the regulations. Regulations, properly executed, would result in a race to the CO_2 bottom as manufactures competed to be the low carbon supplier. [NHTSA-2010-0131-0256-A1, p. 3]

A study sponsored by the steel industry and conducted by the University of California Davis proposes a methodology for CAFE regulation that incorporates life cycle thinking while maintaining the simple grams of CO_2 per mile metric on current EPA-DOT vehicle stickers today and that will dovetail into the existing CAFE regulations. This methodology addresses the unintended consequences and results in real carbon reduction associated with vehicles using information readily available to and easily executed by the vehicle makers. [NHTSA-2010-0131-0256-A1, p. 3]

This proposed life cycle methodology still needs further development in order to be incorporated into regulations, but great strides are being made and should be ready for trial in the coming years. Already, several automakers are utilizing life cycle tools during vehicle design. [NHTSA-2010-0131-0256-A1, p. 3]

The steel industry is building a consortium of stakeholders to further develop this life cycle methodology and identify the details to ensure its feasibility in regulation. Properly devised, we believe life-cycle tools incorporated into the regulation will result in a better framework that increases flexibility for auto designers and improves transparency, while enhancing the environmental integrity of the underlying regulation. The current 2017- 2025 light duty vehicle emission rules call for a mid-term evaluation that will lead to final agency action. We believe that a complete evaluation of the feasibility of incorporating life cycle thinking into vehicle emissions regulation is possible within the mid-term evaluation phase. We will continue to work closely with the EPA and NHTSA on this issue and urge the agencies to actively solicit advice and input from multidisciplinary experts prior to the mid-term review. [NHTSA-2010-0131-0256-A1, p. 3]

In 110 year history of United States Steel Corporation, we have conducted our business practices according to a framework of sustainable business conduct and corporate citizenship established by one of our founders, Judge Elbert H. Gary. These principles, known as the Gary Principles, are established in nine uncomplicated statements. The first of these states, “I believe that when a thing is right, it will ultimately and permanently succeed”. In light of that principle, life cycle thinking applied to climate change regulation is the right thing and we believe it will ultimately succeed. However, ultimately can be a long time with unintended and harmful consequences occurring before the right thing is finally deployed. There is an opportunity during the course of the 2017-2025 vehicle emissions regulations to implement the right solution and avoid unintended consequences. Vehicle emissions regulations that incorporate lifecycle principles is the right approach to achieve positive environmental and economic objectives. Accordingly, we urge regulatory policymakers to begin to investigate the application of life cycle analytics and metrics into future vehicle emissions regulations. [NHTSA-2010-0131-0256-A1, pp. 3-4]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 207-208.]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 209-210.]

So how does this conflict with the national objective of using CO_2 emissions and energy use of vehicles to address climate change? As I stated, many technologies are required to achieve the proposed 54.5 miles per gallon target of high manufacturing emissions. Examples of this: The materials that compete with steel such as aluminum, magnesium and carbon fiber, which are 6 to 20 times more energy- and carbon-intensive in the manufacturing phase on a pound-per-pound basis.

While these materials may improve fuel economy and tailpipe CO_2 emissions in the driving phase, those improvements are not sufficient to offset the upstream CO_2 emissions associated with producing these materials.

To address these unintended consequences and achieve optimal environmental resource allocation, future regulations should evaluate CO_2 emissions associated with all the vehicle's life. This will ensure that technologies are not deployed and improve the driving phase emissions while increasing a vehicle's overall carbon footprint.

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 210-213.]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 214-215.]

The intent and the examples we provided in our discussions with the EPA and NHTSA would include all the materials, but there's a bill of materials that are associated with the vehicle, and it's a standard deliverable that every vehicle comes with, and those can be interpreted with the database as the materials.

So I agree that for OEM to chase the target footprint for the whole supply chain for the thousands of suppliers that produce the vehicle won't be possible. The approach we are recommending uses the database which are available such as the national GREET model that have this data already included in there and it comes very simplified, and there are examples by the OEM of the production vehicles today that have done that.

And, also, we have shared this with, at the recommendation, to the Alliance of Automotive Manufacturers and made the same kind of discussion. Of course, adding another layer of regulation on top of these ones were not seen very positively.

So, when we got through the presentation of this idea of design increases design flexibility; they saw an opportunity in that they would have more ability to comply with the regulations; and, so, they were interested in more information, and we will continue to work with them.

Organization: United Steel Workers (USW)

Additionally, life cycle-based vehicle regulations would establish the United States as the world leader in manufacturing vehicles with the lowest possible emissions, directly resulting in job growth and retention in the domestic manufacturing sector. This is particularly important to the more than 350,000 men and women USW represents who make products – like steel - that are used in auto and light-duty vehicles. [EPA-HQ-OAR-2010-0799-9580-A2, pp. 1-2]

Life-Cycle Greenhouse Gas Emissions [EPA-HQ-OAR-2010-0799-9580-A2, p. 2]

Recent studies at the University of California at Santa Barbara[1] (UCSB) and the University of Michigan[2] have validated the use life-cycle assessment (LCA) principles in determining the true impact of vehicles on total greenhouse gas emissions. A University of California at Davis[3] (UC-Davis) study examined the consequences of continuing to apply tailpipe-only (that is, driving cycle only) regulations that exclude other critical sources of GHG emissions such as those that occur during materials manufacturing. [EPA-HQ-OAR-2010-0799-9580-A2, p. 2]

One objection often raised regarding the use of life cycle principles in regulations is the perceived complexity. This is a concern to car manufacturers because of the large number of parts used to manufacture vehicles and the large number of suppliers in the supply chain. While specific details must be worked out, the UC-Davis study[3] suggests that a bill-of-materials [BOM] approach could simplify the problem. A schematic of the process for using the BOM for LCA calculations in a vehicle is provided in Figure 3. [EPA-HQ-OAR-2010-0799-9580-A2, p. 2] [For Figure 3 please refer to EPA-HQ-OAR-2010-0799-9580-A2, p. 2]

LCA methods are the most straightforward way to account for total emissions. Life cycle emission data exist today for automotive materials [as do models for calculating life-cycle emissions of vehicles]; this is vitally important as materials will carry with them their emissions data just as they do their strength, density, thickness, etc. The important task is to consider how these data and models can be used in future regulations and to use the time available to prepare regulations which ensure a net reduction in emissions from light duty vehicles. [EPA-HQ-OAR-2010-0799-9580-A2, p. 3]

As vehicles become more fuel efficient, materials manufacturing emissions will become an increasingly larger contributor to total life cycle emissions. Several studies indicate this will begin to occur around 2020. [EPA-HQ-OAR-2010-0799-9580-A2, p. 3]

LCA principles and materials life-cycle data are well-known and should allow regulators to introduce life cycle emissions-based regulations by the time such regulations are needed, around 2020. [EPA-HQ-OAR-2010-0799-9580-A2, p. 3]

---

1 - Comparative LCA Model, Roland Geyer, UCSB (download from http://www.worldautosteel.org/Projects/LCA-Study/2010-UCSB-model.aspx)

2 - Various reports on use of LCA methodology, University of Michigan, Center for Sustainable Systems, Greg Keoleian,(download from http://css.snre.umich.edu/publications/all)

3 - Life Cycle Greenhouse Gas Emissions Standards for Passenger Vehicles – The Policy Context, Alissa Kendall, Ph. D., and Lindsay Price, University of California, Davis, December 30, 2011

Organization: World Resources Institute (WRI)

The GHG Protocol team at the World Resources Institute (WRI) would like to offer the following comment to the inquiry on page 75112, section 5 about the current state of life cycle GHG accounting. The GHG Protocol (www.ghgprotocol.org) has recently published two new GHG accounting and reporting standards: Corporate Value Chain (Scope 3) and Product Life Cycle. These standards were initiated based on stakeholder requests for a more comprehensive, life cycle based approach to measuring and mitigating GHG emissions. [EPA-HQ-OAR-2010-0799-7086, p. 1]

Both standards were developed with the participation of over 2300 stakeholders including industry, academia, NGO, and government representatives. During development, the draft standards were road tested by over 60 companies including Ford Motor Company (see the enclosed link) and WorldAutoSteel. Since publications, these standards have already been adopted and endorsed by several large consumer goods companies. In October 2011, Ford announced that they were expanding their GHG measurement program to include scope 3 emissions based on the GHG Protocol Standard (reference attached). [EPA-HQ-OAR-2010-0799-7086, p. 1]

The support we received throughout this progress shows the need for life cycle based GHG accounting. Considering the full life cycle of a product exposes not only additional GHG risk but also reduction opportunities along the supply chain that otherwise would not be discovered. Additionally, taking a life cycle approach to GHG accounting can help avoid unintended consequences associated with shifting GHG burden, especially for new and emerging technologies. Given the extensive technical research by leading experts and broad consensus developed through a three year long multi-stakeholders process, we think GHG Protocol standards provide a much needed tool to help companies, organizations, and governments perform life cycle GHG Accounting. We hope you will consider and use our standards as a tool to help you assess the life cycle GHG impacts of vehicles. [EPA-HQ-OAR-2010-0799-7086, pp. 1-2]

Organization: World Steel Association

In regard to the referenced Docket, the World Steel Association (worldsteel) commends the US EPA for its acknowledgement of the life cycle impacts of vehicle emissions. While we recognize that a life-cycle approach to emissions regulations is a significant paradigm shift, we believe it is the best methodology to truly realize a vehicle carbon footprint reduction. [EPA-HQ-OAR-2010-0799-7766-A1, p. 1]

Significant investments and efforts have been made over the years to apply Life Cycle Assessment (LCA) to products and services to reduce environmental impacts, not only through industry efforts, but through government-driven initiatives as well. While LCA is well known and accepted in scientific circles and government circles around the world, both the United Nations Environment Programme's Life Cycle Initiative and the Society of Environment Toxicology and Chemistry's regional LCA groups (LCA Advisory Group in North America and LCA Advisory Committee in Europe) have organized independently to study and advise on LCA. The World Steel Association is a Board member of this UNEP/SETAC Life Cycle Initiative. [EPA-HQ-OAR-2010-0799-7766-A1, p. 1]

However, the lack of consistency in incorporating LCA into policy and legislative measures fails to recognize these significant achievements, but most importantly fails to capitalize on the greenhouse gas (GHG) emissions reduction potential or comprehend the significant unintended consequences of increased CO2 emissions that are likely to occur unless it is addressed. The automotive industry is a clear example of this: tailpipe emissions remain the overwhelming measurement for GHG emissions in the sector. [EPA-HQ-OAR-2010-0799-7766-A1, p. 1]

Life Cycle inventory data for automotive material applications such as steel, aluminum and other competing products is robust and continues to improve and expand. Considerable academic work is being done to support the application of LCA to regulatory policies such as those aimed at improving the environmental performance of light duty vehicles. [EPA-HQ-OAR-2010-0799-7766-A1, p. 1]

As detailed in the comments submitted by WorldAutoSteel, and the American Iron and Steel Institute (AISI), more advanced internal combustion engine (ICE) technologies emerging in today's cars as well as the future direction of greener vehicles, will reduce tailpipe emissions, calling for a more integrated approach. [EPA-HQ-OAR-2010-0799-7766-A1, p. 1]

- As advanced technologies in ICE progress, tailpipe emissions will lessen, and the relative importance of vehicle manufacturing emissions will increase. The introduction of alternative powertrains, such as Battery Electric vehicles will leave more than half of the total vehicle life cycle emissions unaccounted for in the regulations. Regulations based on the tailpipe will become obsolete. Also, automaker measures taken in an effort to address tailpipe-focused regulations have a great potential to actually cause more harm through unintended consequences.
- LCA is the best methodology to encompass the full vehicle carbon footprint.
- LCA encourages the entire supply chain to optimize their environmental performance as this will become a qualifier in order to be an automotive industry supplier. [EPA-HQ-OAR-2010-0799-7766-A1, p. 2]

A life-cycle approach will drive design and manufacturing flexibility in complying with the regulations, opening the door for even more holistic, creative solutions. [EPA-HQ-OAR-2010-0799-7766-A1, p. 2]

Organization: WorldAutoSteel

WorldAutoSteel and its member companies are keenly aware of vehicle emissions regulations in the world today and would like to take this opportunity to commend the U.S. EPA for their consideration of Life Cycle Assessment (LCA) as you develop the next generation of U.S. emissions standards. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1]

We believe that a Life Cycle Assessment approach is the only way to effectively reduce vehicle carbon footprint. Regulating only tailpipe or use phase emissions could lead to industry responses that actually make things worse. Consider the use of light weight materials to reduce vehicle mass: It does decrease use-phase emissions, but since the production of light weight materials is typically GHG intensive, the emissions during vehicle production are likely to increase significantly. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1]

If the increase in embedded production emissions is greater than the decrease in use-phase emissions, this approach to vehicle light-weighting actually increases total emissions - an unintended consequence. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1]

Vehicle light-weighting is also costly, since it typically relies on expensive materials and requires retooling of manufacturing lines. There is evidence that redesigning power trains offers a better environmental return on investment than light-weighting. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1]

The problems created by ignoring emissions from vehicle production will be further aggravated by future low-carbon fuels and drive-train technologies. While a typical gasoline-powered vehicle currently emits only around 15% of its GHG during production, the use of cellulosic ethanol or a shift towards battery or hybrid electric vehicles would dramatically increase the share of vehicle production emissions. A recent Ricardo Study commissioned by the U.K.'s Low Carbon Vehicle Partnership estimates that vehicle production will grow to 57% of the total life cycle emissions due in large part to the introduction of the battery electric powertrain technology. The production portion of these embedded emissions therefore becomes more dominant and decisions made, such as material selection, become far more critical. For a battery electric vehicle powered entirely by renewable electricity, vehicle production emissions could account for as much as 85% - a complete reversal from today's ICE-powered vehicles. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1]

Without a life cycle assessment strategy in place, decisions will be made that may decrease fuel consumption, but with the unintended consequence of significantly increasing these embedded emissions. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1]

A more thorough way of measuring automotive GHG emissions is by using LCA, which takes into account all of the emissions created during the life of a product from raw material production to product end-of-life. Only when a vehicle's total life-cycle emissions are accounted for can the net environmental impact of different designs be compared. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1]

LCA methodology and practice have been developing since the early 1970s. Today, it is a mature assessment tool with global standards. Independent of legislation many car manufacturers are already using life cycle thinking and LCA, recognizing its importance and effectiveness in product and process design. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1, p. 2]

LCA is equally accepted and used by material producers. In fact, together with many of their member companies, the trade associations of the steel, aluminum, and plastic industries are among the most active members of the global LCA community. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1, p. 2]

Many environmental agencies around the world support life cycle assessment, including the European Commission which calls it "the best framework for assessing the potential environmental impacts of products currently available." Environmental regulators and policy makers have begun to draft legislation with a life cycle perspective, such as California's Low Carbon Fuel Standard3, but need to do so more frequently and consistently. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1, p. 2]

Life-cycle-based automotive GHG regulation is feasible and can be achieved by amending rather than replacing current standards. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1, p. 2]

An automotive life cycle GHG emission standard accounts for the joint emissions from fuel combustion, fuel production, and vehicle production and recycling. Fuel production emissions need to be included so that driving fuel cell or battery electric vehicles do not appear emission free, even though hydrogen and electricity production can be fairly GHG-intensive. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1, p. 2]

[See figure on page 2 of Docket number EPA-HQ-OAR-2010-0799-7174-A1, p. 1, p. 2]

The main task of accounting for vehicle production is to avoid unintended consequences such as the one discussed earlier. Science-based rules need to be established about how to measure emissions from vehicle production. A good starting point would be to multiply the materials composition of a vehicle, which is readily available in automaker bill of materials, with the GHG intensity of each material, also readily available, which would include adjustments due to materials recycling. This would cover the majority of emissions from vehicle production and recycling. Dividing the emissions from vehicle production and recycling by total driven distance, also readily available, yields a measure in grams of CO_2 equivalent per km and can be readily added to the fuel cycle measure. This is illustrated in the figure above for two compact class vehicles with differing materials compositions. This approach is simple for the vehicle makers to implement and is sufficient to avoid the unintended consequences that will occur with tailpipe only emissions. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1, p. 2]

Automotive life cycle GHG emission standards are feasible and will benefit the climate. Life Cycle Assessment is included in other industry emissions standards; however, life-cycle-based environmental regulation is in its infancy and requires an investment of resources to bring this approach to a mature state. We feel this can be accomplished in support of the interim review period anticipated in 2018. Nevertheless, the regulation of automotive GHG emissions provides a unique opportunity to align regulatory practice with the state of the art in environmental product policy and launch a new area of enlightened and successful environmental legislation. [EPA-HQ-OAR-2010-0799-7174-A1, p. 1, p. 3]

Response:

EPA recognizes that there are GHG emissions associated with vehicles beyond those emitted during vehicle operation or the “use” phase, including emissions from component and vehicle manufacturing and end-of-life disposal.[26] We thank the commenters who responded to our request for studies on this topic by providing information on their own or external research. We also appreciate the World Resources Institute’s comment highlighting two recent GHG accounting and reporting standards related to life-cycle assessments. EPA is glad to see the advances in research on this important issue and plans to continue to monitor new work in this area.

[26] For a discussion of GHG emissions associated with the production and distribution of fuel (including emissions due to electricity generation used to power EVs and PHEVs), see Sections 4 and 6 of this document.

The GHG standards we are finalizing for MY2017-MY2025 do not incorporate vehicle manufacturing or end-of-life emissions. We agree with comments by the American Chemistry Council and the Society of the Plastics Industry, Inc. that these emissions are typically small relative to GHG emissions from vehicle operation, and therefore regulating emissions from the use phase is an effective method for reducing GHG emissions from vehicles.

However, we acknowledge the point made by other commenters that the relative significance of manufacturing emissions, and other non-use phase emissions, will increase as vehicles' fuel economy improves over time. Some advanced vehicle technologies and materials designed to reduce GHG emissions at the tailpipe may also be more energy and carbon intensive to manufacture than conventional vehicles and result in vehicle production accounting for a higher fraction of total life-cycle GHG emissions (e.g., electric vehicles powered by a low-carbon grid or certain light-weighting materials).

Kendall highlighted one such example from her research at the University of California, Davis comparing life-cycle emissions from two modeled MY2020 vehicle designs. She found a more fuel-efficient vehicle (which utilizes magnesium and aluminum to reduce mass) to have higher overall life-cycle GHG emissions than a heavier, less fuel-efficient model that incorporates less of these materials. We recognize that such tradeoffs are possible and plan to monitor how materials usage for future vehicles changes over time. However, as discussed in chapter 3 of the Joint TSD, the agencies believe that manufacturers will be able to meet the MY2017-2025 GHG standards through a combination of technologies, without relying on a level of mass reduction that requires a high penetration of these light-weighting materials. Therefore, EPA believes that these standards are unlikely to significantly impact vehicle production emissions and the overall balance of GHG emissions (i.e., production versus use phase) for the light-duty fleet due to the use of these materials.

We also believe there is currently too much uncertainty about the life-cycle impacts of future advanced technologies to conduct the type of detailed, transparent, and replicable vehicle-specific assessments that would be needed in a regulatory context. The GHG standards being finalized in this rule are based on uniform test procedures that hold automobile manufacturers accountable for emissions during vehicle operation. By contrast, full life-cycle accounting would require automobile manufacturers to account for GHG emissions associated with a vehicle's complete material supply chain and would require assumptions about how materials and components would be used at the end of a vehicle's life, which are particularly uncertain for future and emerging technologies such as electric vehicle batteries.

Kendall and several organizations from the steel industry suggested a possible approach for incorporating vehicle production emissions into GHG standards by linking a vehicle's bill of materials to an established GHG emissions model. While such a framework may be possible, it would not eliminate many of the challenges associated with finding a comprehensive and consistent set of emissions data and assumptions that would be fair and robust across all technologies. Also, the bill of materials may not capture differences in material origin that could impact GHG emissions (e.g., the percentage of recycled content, and the location and processes used for production). NHTSA conducted a literature review of life-cycle studies for certain vehicle technologies as part of its Environmental Impact Statement for this rulemaking.[27] The range of different models and approaches utilized in the surveyed studies and the sensitivity of the results to study assumptions further illustrate these challenges.

Moreover, in addition to the evident difficulties in accounting for life-cycle emissions relating to upstream manufacturing in a reliable, transparent, and replicable manner, these section 202 (a) standards are in the end for control of vehicular emissions. Compliance in virtually all instances is measured at the tailpipe.[28] Standards reflecting manufacturing life-cycle GHG emissions would be more wide-ranging, changing the focus of the program at least in part from vehicular emissions to manufacturing emissions. The Clean Air Act provides direct means for control of stationary source GHG emissions, and EPA does not believe it appropriate, at least at this time, to approach these issues indirectly by means of section 202 (a) vehicle emission standards. See also the discussion in preamble section III.C.2.c.v, related to upstream accounting of emissions from sources generating electricity used to power electric and plug-in hybrid electric vehicles explaining that this rule establishes a vehicle emission program, not a fuel based program.

We note the recommendation of several organizations to further investigate incorporating life-cycle emissions, including manufacturing emissions, into later model year vehicle regulations as part of the agency's mid-term evaluation. EPA plans to consider a broad range of factors in its mid-term evaluation in order to determine whether the MY2022-2025 GHG standards are appropriate under section 202(a) of the CAA. EPA will develop and compile up-to-date information for the review through a collaborative and transparent process, including public notice and comment. See section III.B.3 of the preamble for more information on the mid-term evaluation. As noted above, EPA intends to continue to monitor new research related to vehicle life-cycle assessment and would therefore be interested in reviewing any additional work conducted to evaluate vehicle-specific production and end-of-life GHG emissions based on the bill of materials (BOM) or other approaches.

[27] See Ch. 6, "Literature Synthesis of Life-cycle Environmental Impacts of Certain Vehicle Materials and Technologies," Docket No. NHTSA-2011-0056.

[28] As explained in section III.C.2.c.v of the preamble, the rule accounts for upstream emissions attributable to energy use by EVs and PHEVs in limited circumstances. While this upstream value does not reflect a single means of generating electricity, the aggregated emissions from electricity generating facilities and their various fuels can be estimated with reasonable certainty, and so differ from evaluating the upstream GHG emissions attributable to the vast range of individual manufacturing facilities and processes.

15. Economic Assumptions Used in Analyses

15.1. On-Road Fuel Economy Gap

Organizations Included in this Section

U.S. Coalition for Advanced Diesel Cars

Organization: U.S. Coalition for Advanced Diesel Cars

Accurately account for the on-road Miles Per Gallon (MPG) gap. [NHTSA-2010-0131-0246-A1, p.2]

On-Road MPG Gap [NHTSA-2010-0131-0246-A1, p.11]

EPA is fully aware that the gap between CAFE certification and on-road fuel economy in the real world has been growing for years. The following table, which is derived from data as published in EPA's annual Light Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975-2010 ("Trends Report") demonstrates the growing gap. [NHTSA-2010-0131-0246-A1, p.11]

As shown above, the gap between CAFE and 5-cycle label mpg, which was just 2.2 miles per gallon in 1975, has increased to 5.8 mpg through 2010, or a gap of more than 20.5 percent. While the fleet average gap was an even 20% in 2005, it jumped to 20.5% in 2010, following a decade's long upward trend. In terms of GHG emissions, the gap is now close to 26 percent between emissions that are measured under certification tests and emissions that occur in real-world driving. EPA is aware of this growing gap and also is aware that certain technologies are driving the fleet average gap to increase much faster than others. [NHTSA-2010-0131-0246-A1, p.12] [For the figure referenced 'above', please refer to NHTSA-2010-0131-0246-A1, p.11]

"This greater impact occurs primarily because a number of the fuel efficient aspects of hybrid vehicles produce their maximum benefit under conditions akin to the FTP and HFET tests, and are somewhat less beneficial during aggressive driving, colder ambient temperatures and when the air conditioner is turned on." [NHTSA-2010-0131-0246-A1, p.12]

The following exhibit shows the growing gap between the 2-cycle CAFE tests and 5-cycle label fuel economy, based on EPA's 2012 Fuel Economy.gov database of all light duty vehicles available in the U.S. market.[12] [NHTSA-2010-0131-0246-A1, p.12] [For the associated 'exhibit' please refer to NHTSA-2010-0131-0246-A1, p.12]

Just as EPA found in its 2006 analysis, the fuel economy gap for hybrid electric vehicles is far greater than the fleet average. In fact, the on-road gap for several HEVs is well above 30%. Under rapidly increasing fuel economy standards, the on-the road gap will continue to grow unless test procedures are brought up to date. [NHTSA-2010-0131-0246-A1, pp.12-13]

When calculating the benefits of the proposed rule, EPA fails to recognize the diminishing correlation between lab and on-the-road fuel economy. Instead, EPA risks to freeze the gap at 20 percent for purposes of measuring benefits consumers will realize under the rules, where the CAFE mpg is multiplied by 0.80 to estimate on-road fuel economy. As shown in the table above, although the Trends Report shows a gap of 20% for 2005, by 2010 the gap had risen to 20.5%. Instead of relying on fleet average label values from the Trends report, EPA and NHTSA, beginning on page 4-4 of the Joint TSD, explain that they are relying on the Federal Highway Administration's (FHWA) estimation of the fuel economy cars and light-duty trucks achieve as Americans drive in the real world. In describing the reasons that they are using a constant 20% on-the-road gap, rather than a growing gap as evidenced in the Trends Report, the agencies state: [NHTSA-2010-0131-0246-A1, p.13]

'We are not aware of the precise methodology used to develop the distinct on-road fuel economy estimates for cars and trucks developed by FHWA." [NHTSA-2010-0131-0246-A1, p.13]

The Coalition recommends that the agencies look at U.S. DOT Publication No. FHWA-PL-121-031, published August, 2011. This document provides a detailed description of the methodology FHWA uses to estimate on-the-road fuel economy for light duty vehicles as it attempts to mathematically allocate how much fuel is consumed by each class of vehicle in the nation (cars, motorcycles, busses and heavy trucks, etc.) On page 8 of this report, FHWA states that the EPA Trends Report 5-cycle label values are the source for estimating on-the-road fuel economy for vehicles in the fleet. In summary, FHWA uses EPA 5-cycle label fuel economy as an input to its complex model to allocate fuel use by vehicle type while EPA does not use the same procedure. [NHTSA-2010-0131-0246-A1, p.13]

Since EPA is actively promoting hybridization through its rulemaking, we question why it has elected to freeze the on-road gap at 20% when calculating benefits, since its own data shows this gap has and will continue to expand through the duration of the rule. If the EPA is not planning to update test procedures for purposes of administering fleet average rules and reporting fuel economy to consumers on EPA labels, then we urge the agency to show the range of benefits it is able to calculate as the gap between laboratory and real, on the road fuel economy continues to grow through 2025. [NHTSA-2010-0131-0246-A1, p.13]

---

12 - Data from EPA/DOE www.fueleconomy.gov 2012 Fuel Economy Datafile. Analysis by the Martec Group.

<u>Response:</u>

This comment is discussed in TSD 4.2.1. As noted there, the U.S. Coalition for Advanced Diesel Cars suggested that the on-road gap used in the proposal was overly conservative, and that advanced technology vehicles may have on-road gaps larger than 20%. The agencies recognize this potential issue – future changes in driver behavior or vehicle technology may change the on-road gap. The Coalition states that the EPA 2012 Trends Report shows that the gap for gasoline vehicles grew from 20% in 2005 to 20.5% in 2010, and that therefore the 20% value used by the agencies is understated. We note that in recognition of the potentially greater gap for electrification technologies, the agencies are using a 30% adjustment for wall electricity; but more broadly, to the extent that the Coalition is suggesting that the agencies extrapolate the growth trend in the gap into the future, the agencies do not agree that the estimate of the future on-road gap would be appropriately estimated by extrapolating the historical relationship between the test procedure and real world fuel consumption and emissions. That historical rate of change occurred as a result of the specific technological changes in vehicles over that timeframe. In the future, different technologies will be employed, that are likely to affect the gap differently. As an example, while some technologies such as electrification may increase the on-road gap, other off-cycle technologies such as tire pressure management systems, air conditioning improvements and aerodynamic improvements may decrease it. Thus, the agencies are continuing to use the same on-road gap methodology as in the proposal for this final rulemaking, but will monitor the EPA fuel economy database as these vehicles enter the fleet.

With regard to the comments regarding FHWA-PL-121-031, we appreciate the reference, although, we believe the commenters mean FHWA-PL-11-031. We have removed the relevant sentences from the text.

15.2. Vehicle Lifetimes and Survival Rates

No comments were received on this topic.

15.3. Vehicle Miles Traveled

15.3.1. Issues of Car-Truck VMT Used for Credit Transfers

No comments were received on this topic.

15.3.2. VMT Growth Projections

No comments were received on this topic.

15.3.3. Rebound Effect

Organizations Included in this Section

Consumer Federation of America (CFA)
Defour Group LLC
International Council on Clean Transportation (ICCT)
Plant Oil Powered Diesel Fuel Systems, Inc.

Organization: Consumer Federation of America (CFA)

- The rebound effect in the national cost-benefit analysis should be smaller. [EPA-HQ-OAR-2010-0799-9419-A1, p. 14]

Rebound effect: When U.S. consumers drive vehicles that get more miles to the gallon, they save money on their gasoline bills. They have more money in their pockets to spend. Whether or not they choose to use some of that extra spending money to drive more, they are still better off.19 From a national cost-benefit point of view, the rebound effect should be subtracted from the fuel savings, but from the point of view of the individual consumer, the analysis must assume that all of the savings increase consumer welfare and that consumers choose to use those savings in a manner that maximizes their individual welfare. For this reason, the rebound effect should be subtracted in the national cost benefits analysis but not the consumer pocketbook analysis.[EPA-HQ-OAR-2010-0799-9419-A1, p. 52]

---

19 We have argued that the rebound effect should be taken into account only in the national cost-benefit analysis and then modelled as an income effect, not a price effect. That is, the consumer would devote extra dollars of disposable income to gasoline expenditures reflecting the marginal value of gasoline. This would put the current rebound effect in the range of 5%, which is what more recent studies have found.

Organization: Defour Group LLC

V. Social Benefits and Costs of the 49.6 mpg Standard

In Table VIII-27b, page 715 of the PRIA, the agencies estimate a net social loss of $2.2 billion in MY 2025, which in a 17 million unit sales year comes to a loss of just over $100 per vehicle. This estimate is the sum of $2.5 billion in "Reduced Health Benefits from Criteria Emissions," $9.7 billion in "Climate Damages from CO_2 Emissions," and $4.4 billion in "Reduced Petroleum Market Externalities," less a $9.6 billion "Change in [loss of] Fuel Tax Revenues" and $9.3 billion in "Increased Costs of Congestion, etc." [EPA-HQ-OAR-2010-0799-9319-A1 p. 10]

These estimates reflect a rebound effect – the impact of reduced fuel costs on increased vehicle driving and thus increased fuel consumption -- of just 10% and totally ignore the impact of the so-called clunker effect, which is the effect of higher vehicle prices and consumer welfare losses on the retention of older and higher emitting used vehicles.12 If, consistent with the mainstream literature, we assume a 20% rebound effect (see Part VII) and, following Goulder et al, a clunker effect of 31.5%,13 the estimates of emissions reductions and fuel tax revenue losses in the table should be reduced by 45% and the estimates of congestion and other externality costs (including highway accident externality costs) should be increased by a factor of 2.14 The net result is a social welfare loss of $900 per vehicle (as always, rounded to the nearest $100 per vehicle).15 [EPA-HQ-OAR-2010-0799-9319-A1 p. 10]

This initial estimate is substantially understated. The higher rebound effect combined with the clunker effect means that criteria pollution emissions will actually increase as a result of the standard, as criteria pollution is the product of vehicles miles traveled, which increases with the rebound effect, and emissions per vehicle on the road, which rises because of the clunker effect as more higher emitting used vehicles remain on the road. Gruenspecht found, for example, that because of the clunker effect, California's Zero Emission Standard for MY 2003 would actually increase criteria pollution emissions by 3 to 15 times the amount of the estimated emissions reductions for new vehicles.16 [EPA-HQ-OAR-2010-0799-9319-A1 p. 10]

VIII. The Rebound Effect: Crucial Determinant of Private and Social Welfare Effects

As we have shown, estimates of the rebound effect – the offsetting increase in fuel consumption caused by increased driving in response to higher fuel economy and thus lower fuel costs –are critical to the estimates of both private and social benefits of the standards. A higher rebound effect means lower private fuel savings and lower estimates of climate and energy security benefits. It also means proportionately higher estimates of congestion and accident externality costs that must be subtracted from the nowreduced climate and energy security estimates. [EPA-HQ-OAR-2010-0799-9319-A1 p. 16]

We find that the agencies' use of a 10% rebound effect understates the actual level by at least a factor of two. The agencies justify their 10% estimate on the basis of two studies: a forthcoming study of rebound effects that is as yet unavailable to the public, but which the author, Dr. Greene, graciously provided to these reviewers, and an earlier study by Small and Van Dender, which Greene (appropriately) rejects as an inadequate reflection of reality and as a violation of economic first principles. Dr. Greene found a negative (albeit statistically insignificant), relationship between fuel economy (mpg) and vehicle miles traveled (vmt) as opposed to the predicted, intuitively appealing positive value. However, when several errors in his study are corrected, it supports other recent studies that imply fuel price elasticities and thus rebound effects of 30% and higher. [EPA-HQ-OAR-2010-0799-9319-A1 p. 16]

Of particular concern in Greene's study is the aggregation problem – a problem that can cause dramatic over estimates of implicit consumer discount rates and underestimates of the responsiveness of automotive fuel economy levels to fuel prices.26 Work by Resources for the Future economist Elsheba Spiller, for example, shows that Greene's use of one overall car and light truck light-duty fleet could bias his results downward by as much as 51%. That is because it fails to allow enough margins over which auto buyers can adjust their purchasing decisions in response to changing fuel prices and levels of fuel economy. If there is only one level of aggregation – the entire fleet of cars and light trucks, it may not be possible to tell whether a rising level of fuel prices or fuel costs is causing a shift within the aggregate fleet to more fuel-efficient vehicles. The modeler's regression study could show little or no response on the aggregate when there has been a substantial movement to higher mpg vehicles at lower levels of aggregation.27 [EPA-HQ-OAR-2010-0799-9319-A1 p. 16]

In Greene's study light truck vehicle miles traveled (vmt) exceeded that of passenger cars by as much as 1,500 miles per year, which has nothing to do with the influence of fuel cost on vmt. So as the light truck market share and thus vmt increased over the period, Greene's proxy for fuel cost, gallons per mile (the reciprocal of fuel economy or miles per gallon), also rose, causing a spurious positive correlation between his measure of fuel cost and vmt. It is not surprising, then, that his point estimate for the influence of fuel costs on vehicle miles traveled (vmt) is positive – that as fuel economy falls and thus his measure of "fuel costs" rises, his model finds that consumers will drive their vehicles more, not less (and conversely). [EPA-HQ-OAR-2010-0799-9319-A1 p. 17]

It would also seem that gallons per mile is not a good measure of fuel cost, which requires the dollar sign in the numerator. Without the price of gasoline in the numerator, the measured level of fuel costs -- gallons per mile -- can increase even when fuel cost per mile is falling and can fall when fuel cost per mile is actually rising. Certainly, real-world consumers would be foolish to look at mpg or its reciprocal in a vacuum. [EPA-HQ-OAR-2010-0799-9319-A1 p. 17]

We agree with Dr. Greene that his result – that as fuel costs rise auto owners do not respond by reducing their driving (and possibly even increase their driving) -- is counter intuitive. Indeed, it violates the most well-established finding in all of economics, what economists call the “First Law of Demand” – that, all else equal, when the price of a good or service rises, less is demanded, not more or none at all.28 [EPA-HQ-OAR-2010-0799-9319-A1 p. 17]

His rationale for finding that owners do not reduce their driving when fuel costs rise is that binding fuel economy standards cause vehicle prices to rise and that increased amortization of the higher purchase prices partially offsets the reduction in fuel costs. To be sure, binding mandates do raise the average price of the new car fleet. But much of the increase is an increase in fixed costs that, unlike reductions in fuel costs, does not affect the marginal and thus variable cost of driving. Much of the increase is dissipated immediately after the vehicle is taken home from the showroom and a further amount later by vehicle obsolescence that is related solely to age and not to the wear and tear that comes with vehicle miles traveled. [EPA-HQ-OAR-2010-0799-9319-A1 p. 17]

The only empirical evidence Greene offers in support of a negative or zero rebound effect is Greene’s downward-biased estimate and that of Small and Van Dender – the other study on which the agencies rely for their estimate of a 10% effect. But Greene, correctly, in our view, rejects the Small and Van Dender rebound study, the update of which now finds a 15% rebound effect,, because, as he says, it “does not represent an adequate representation of the effect of fuel economy standards,” and because, as he also points out, it finds a lack of statistical significance for the fuel price variable, which “creates doubts about the validity of the methodology.” Indeed, economists at NERA Consulting found that Small and Van Dender failed to account for cost of living differences across the metropolitan areas covered by his study, so that seemingly high fuel prices in some areas were actually lower than fuel prices in other areas. Correcting for this error and for certain econometric shortcomings, they found a statistically significant rebound effect of a positive 0.24.29 [EPA-HQ-OAR-2010-0799-9319-A1 p. 18]

As Greene observes, “Most studies [of rebound effects] base their estimates on the elasticity of vehicle travel with respect to fuel cost per mile, thereby constraining the elasticity of fuel price to be equal and opposite in sign to the elasticity of fuel economy.” As he also notes, they make this assumption because “the two affect fuel cost per mile in equal and opposite ways.”30 Greene’s own study rejects that hypothesis, finding a (longrun) fuel price elasticity of 0.30 and finding a statistically insignificant fuel cost elasticity. [EPA-HQ-OAR-2010-0799-9319-A1 p. 18]

Greene cites two other studies of this issue. He reports that one (Schimek31) “estimated the elasticities of vehicle travel with respect to fuel price and with respect to fuel economy individually,” finding, in Greene’s words, that fuel price elasticity and fuel economy elasticity – the rebound effect – were “almost precisely equal and opposite in sign as theory would predict.”

Greene co-authored the other study, which, in his words, did not reject the hypothesis of "equal and opposite effects" for the fuel price and mpg elasticities. Greene ignores yet two other studies, one of which was performed by Yale Professor Pinelopi Goldberg, current editor-in-chief of the American Economic Review, and both of which found fuel price and fuel cost elasticities of equal and opposite magnitude.32 Clearly, the weight of the literature is on the side of equal and opposite effects. [EPA-HQ-OAR-2010-0799-9319-A1 p. 18]

In our view, the agencies should, therefore, take account of recent research by Spiller and by Greene himself, that finds fuel price elasticities far higher (in absolute values) than the minus 0.20 reported in much of the econometric literature. Greene finds an elasticity of minus 0.30. As previously noted, Spiller finds base elasticities of minus 0.30, rising to as "high" as minus 0.43 when aggregation errors are taken into account33 – suggesting similar real-world values for the rebound effect. At a minimum, an estimate of at least 25% seems warranted at this time. [EPA-HQ-OAR-2010-0799-9319-A1 p. 19]

Finally, Greene finds that there has been a secular decline in the rebound effect in response to rising incomes, mirroring the results of Small and Van Dender's regressions. However, as we have shown, those regression studies contain serious errors that bias the estimates of rebound effects and their mirror image, fuel price elasticities (in absolute values), dramatically downward. What's more, the decline that he tracks occurred during a period of record low fuel prices and recent research, including Spiller's for the years 2001 through 2009 and his own, finds a sharp uptick even as fuel prices have rebounded to record highs. This suggests that as fuel prices have risen, fuel costs have become a higher percentage of the household budget, which renders households more, not less responsive to fuel prices and thus fuel costs. It further suggests that as time goes on rebound effects may rise along with rising fuel prices and as consumer expectations catch up with those increases over the years. EPA-HQ-OAR-2010-0799-9319-A1 p. 19]

---

12 - Howard Gruenspecht, "Zero Emission Vehicles: A Dirty Little Secret," Resources (Winter 2001) at http://www.rff.org/rff/Documents/RFF-Resources-142-zeroemmis.pdf

13 - Lawrence Goulder, Mark Jacobsen, and Arthur van Benthem, "Unintended Consequences from Nested State & Federal Regulation: The Case of Pavely Greenhouse-Gas-per-Mile Limits," Stanford, University of California at San Diego, NBER, and Resources for the Future, Available at SSRN: http://ssrn.com/abstract=1491895, page 26.

14 - If the rebound effect of 20% reduces fuel savings and attendant ghg and energy security benefits to 80% of those in the table and if the clunker effect cuts that 80% by another 31.5%, the net effect is a 55% reduction of those values. Raising the rebound effect from 10% to 20% implies a doubling of the estimate for the externality costs of raising the standards, which bear a straight-line relationship to the rebound effect.

15 - Total Social Benefits in Table VIII-27b, page 715 of the PRIA come to $16.7 billion in MY 2025. Total Social costs come to the sum of Lost Fuel Tax Revenues of $9.6 billion and

Increased Congestion (and accident) Costs of $9.3 billion, or $18.9 billion, for a net social welfare loss of $2.2 billion, which divided by 17 million unit sales comes to a loss of $129 per vehicle. The 45% offset for the combined leakage associated with the rebound and clunker effects reduces total benefits to $9.15 billion and reduces fuel tax revenue losses to $5.26 billion. The doubling of the rebound effect raises Increased Congestion (and accident) Costs to $18.6 billion. Total net costs or welfare losses are increased to $14.7 billion, or $864 per vehicle.

16 - Gruenspecht, Ibid.

26 - See Meghan Busse, Christopher Knittel, and Florian Zettlemeyer, "Pain at the Pump: The Effect of Gasoline Prices on New and Used Automobile Markets, University of California Energy Institute, UC Davis Institute of Transportation Studies and National Bureau of Economic Research (September 2011), James Sallee, Sarah West, and Wei Fan, "The Effect of Gasoline Prices on the Demand for Fuel Economy in Used Vehicles: Empirical Evidence and Policy Implications," May 24, 2011, funded by the Energy Initiative at the University of Chicago and by the Keck Foundation of Macalister College, and Elisheba Spiller, "Household Vehicle Bundle Choices and Gasoline Demand," Resources for the Future and Duke University, January and July 2011 at http://emf.stanford.edu/files/docs/322/SPILLER.pdf and http://fds.duke.edu/db/aas/Economics/phd/elisheba.spiller/files/Elisheba%20Spiller%20Job%20Market%20Paper.pdf (two separate papers).

27 - Spiller, Ibid.

28 - Of course, "all else is not equal" in his analysis because he fails to account for the secular movement from lower VMT and lower gallons per mile cars to higher VMT and higher gallons per mile trucks.

29 - NERA Economic Consulting, Evaluation of NHTSA's Benefit-Cost Analysis of 2011-2015 CAFE Standards, Alliance of Automobile Manufacturers (2008), Appendix B.

30 - Ibid, pages 3 and 7.

31 - P.aul Schimek, "Gasoline and Travel Demand Models Using Time Series and Cross-Section Data from the United States," National Research Council/Transportation Research Board, Transportation Record 1558, 83-89

32 - Pinelopi Goldberg, "The Effects of the Corporate Average Fuel Efficiency Standards in the US," Journal of Industrial Economics, (1998) and Antonio Bento, Shanjun Li, and Kevin Roth, "Is There an Energy Paradox in Fuel Economy?" A note on the Role of Consumer Heterogeneity and Sorting Bias," Resources for the Future, November 2010.

33 - See Spiller supra note 23.

Organization: International Council on Clean Transportation (ICCT)

12. Historical VMT rebound estimates should not be used, as they do not consider the impacts of personal income, vehicle efficiency, and fuel prices. Only dynamic models of the future VMT rebound effect are appropriate and should be used in the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

12) VMT Rebound Effect

The agencies used a fixed estimate of 10% for the rebound effect. This estimate was not based upon the latest research, but instead was a compromise between the latest research and outdated historical data:

'In summary, the 10 percent value was not derived from a single estimate or particular study, but instead represents a compromise between historical estimates and projected future estimates.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 24]

'As we discussed in the 2012-2016 rulemaking and in Chapter 4 of the Joint TSD, this value was not derived from a single point estimate from a particular study, but instead represents a reasonable compromise between the historical estimates and the projected future estimates.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 24]

The agencies quoted the latest research from Small and VanDender and David Greene demonstrating that the rebound effect is linked to personal income and vehicle efficiency, as well as fuel prices, and has been declining over time. EPA also referenced recent work by Kenneth Gillingham, who provides suggestive evidence that consumers may be less responsive to changes in fuel efficiency than to changes in fuel prices. Yet, when it came time to select the number used for the rebound effect, outdated studies with strictly historical effects were given equal weight to the recent studies projecting the future VMT effect. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 24-25]

The proposed rule asks for the submission of new data regarding estimates of the rebound effect and comments on the methodology for applying the rebound effect. Additional data is not needed. The Greene and Small and VanDender work is the proper basis for calculating the rebound effect. They made a major contribution to the field by incorporating economic impacts and the cost of driving into calculations of price elasticity of demand. This is much more appropriate than assuming a fixed 10% rebound effect that does not take into account future changes in vehicle efficiency, fuel prices, and future income. Only future projections of the rebound effect that include the impacts of personal income, vehicle efficiency, and fuel price should be used to calculate the future rebound effect. [EPA-HQ-OAR-2010-0799-9512-A1, p. 25]

Organization: Plant Oil Powered Diesel Fuel Systems, Inc.

1. The Proposed GHG Standards are inconsistent with law because do not regulate greenhouse gasses. Instead, their main thrust is to regulate fuel economy. Fuel economy is not an accurate surrogate for greenhouse gas emissions because of the rebound effect, whereby an improvement in diesel engines' fuel efficiency has, in the aggregate, the paradoxical result of increasing

consumption of the energy resource necessary to run the engines, and consequently, increasing GHG emissions. While the Proposed Regulations acknowledge the factual existence of the rebound effect, their analysis of it is incomplete and unduly limited. The expert opinion of Dr. Harry D. Saunders ("Dr. Saunders") demonstrates that the Proposed Regulations, as drafted, "grossly overestimate the savings in total overall energy consumed, and CO_2 emissions reduced," resulting from the Proposed Rules. Declaration of Dr. Saunders ("Saunders decl."), paragraph 18 (Exhibit 1). [EPA-HQ-OAR-2010-0799-10337-A2, pp. 1-2]

a. re-do their assessment of the rebound effect on GHG emissions resulting from the Proposed GHG Standards, in light of Dr. Saunders's information and opinion (Exhibit 1 [Docket number EPA-HQ-OAR-2010-0799-9882-A2]); [EPA-HQ-OAR-2010-0799-10337-A2, p. 2]

While relying on other, preexisting EPA Regulations, the main mechanism that the Proposed GHG Standards utilize for reducing fuel consumption and GHG emissions is fuel economy. The Agencies couple improvements in fuel economy with a corresponding equivalent decrease in GHG emissions, CO_2 being by far the biggest constituent of GHG emissions from mobile sources. [EPA-HQ-OAR-2010-0799-10337-A2, p. 3]

The Agencies acknowledge that a rebound effect exists, but they limit consideration of the rebound effect to narrow grounds: the result that improved fuel economy will lead to an increase in vehicle miles traveled ("VMT"). [EPA-HQ-OAR-2010-0799-10337-A2, p. 3]

POP DieselTM herewith submits evidence responding to the Agencies' appeal for more information on the rebound effect. This evidence is in the form of the declaration by Dr. Saunders, a leading American scholar and researcher on the rebound effect. Saunders decl. (Exhibit 1). In summary, Dr. Saunders states that the rebound effect, properly understood, has both direct and indirect manifestations in the economy. The Proposed Regulations' treatment of the rebound effect ignores all indirect effects. Saunders decl., paragraphs 14-15 (Exhibit 1). [EPA-HQ-OAR-2010-0799-10337-A2, pp. 3-4]

The Agencies' consideration of direct rebound is limited to only one aspect of direct rebound: an increase in vehicle miles traveled ("VMT") caused by lowered engine operating costs due to improved fuel efficiency. Saunders decl. (Exhibit 1). The Proposed Regulations estimate a 10 percent rebound effect due to increased VMT occasioned by more fuel efficient light duty engines. However, a study of the passenger vehicle market in Germany put this figure of rebound caused by increased VMT at 58 percent. Saunders decl., at paragraph 12 (Exhibit 1). [EPA-HQ-OAR-2010-0799-10337-A2, p. 4]

A recent article from the Wall Street Journal illustrates an aspect of the direct rebound effect that the Agencies do not consider, but automakers acknowledge: the head of marketing for Chevrolet states that improved fuel economy spurs demand for bigger sport utility vehicles and pick-up trucks. "Americans Embrace SUV's Again," Dec. 2, 2011, at page 1 (Exhibit 2). This phenomenon lowers, if not defeats, the overall fuel economy savings that would result if consumers stayed with more fuel efficient, smaller motor vehicles. The Proposed Regulations play into this shift towards bigger, higher fuel consuming vehicles, which erases expected gains from improved fuel economy. [EPA-HQ-OAR-2010-0799-10337-A2, p. 4]

A recent study by C.R. Knittel of the Massachusetts Institute of Technology gauges the direct rebound effect in the light duty market, including shifts to bigger engines and vehicles, and not just VMT, at 75 percent. Saunders decl., at paragraph 6 (Exhibit 1). Others raise the prospect that engine efficiency rules like those incorporated into the Proposed Regulations may lead to “energy backfire,” a condition of greater than 100 percent rebound, “wherein an energy efficiency gain leads to an absolute increase in overall energy use.” Saunders decl., paragraph 8 (Exhibit 1) (referring to study from Austria). [EPA-HQ-OAR-2010-0799-10337-A2, pp. 4-5]

Furthermore, the Agencies underplay the uncertainty of their estimates of the rebound effect. Saunders decl., paragraph 16 (Exhibit 1). This underestimated uncertainty undermines the credibility of their predictions for total overall fuel savings resulting from the Proposed Regulations’ mandate for better fuel economy. Saunders decl., paragraph 17 (Exhibit 1). All of the foregoing flaws in the Agencies’ analysis of the rebound effect increase the chance that due to the true magnitude of the rebound effect, the Proposed Regulations may not, in fact, reduce GHG emissions, but may backfire and make them worse. [EPA-HQ-OAR-2010-0799-10337-A2, p. 5]

The Latest Evidence of the Rebound Effect Shows That the Proposed Regulations Will Actually Backfire and Produce More New Greenhouse Gas Emissions Than They Save.

In support of POP Diesel™'s position criticizing reliance on Fuel Economy Standards to achieve Greenhouse Gas Reductions, POP Diesel™ submits herewith in their entirety two copyrighted academic studies:
1. Christopher Knittel, "Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector," American Economic Review 2012, 101 (December 2011): 3368-3399 (Exhibit 1). This study points out that sales-weighted CAFE standard has changed little since 1983 because automakers have increased the size of vehicles in their fleets to take advantage of mandated improvements in fuel economy.
2. Kate S. Whitefoot and Steven J. Skerlos, "Design Incentives to Increase Vehicle Size Created from the U.S. Footprint-Based Fuel Economy Standards," Energy Policy 41 (2012), 402-411 (Exhibit 2). This article quantifies the effectiveness or lack of effectiveness of the footprint-based approach taken in the Proposed Regulations to countering the rebound effect. The Agencies have not conducted such a quantitative analysis. This article concludes that, for instance, in 2017, a rebound effect of at least 71 percent will ensue and that the rebound effect will more likely than not be above 100 percent, producing a backfire condition by which the Proposed Regulations' dependence on Fuel Efficiency Standards will actually increase the overall amount of energy consumed and greenhouse gases emitted. [These comments were submitted late on July 31, 2012, EPA-HQ-OAR-2010-0799-11820]

Response:

Commenters suggested that EPA should use values both lower and higher than our proposed value of the VMT rebound effect. We did not find that the commenters presented any persuasive new data or analysis that justify revising the 10 percent value at this time, so we continued to assume a 10 percent value in the final rule (i.e., we assume a 10 percent decrease in fuel cost per mile from our standards would result in a 1 percent increase in VMT). We relied on a wide range of peer-reviewed literature to inform our estimate of the VMT rebound effect, including recent studies and projected estimates as well as a larger body of historic literature using both aggregate and household level data. As we discussed in the preamble (section III.H.4.c) and Chapter 4.2.5.3 of the Joint TSD, the 10 percent value was not derived from a single point estimate or from a particular study, but instead represents a reasonable compromise between historical estimates and projected future estimates.

The Consumer Federation of America (CFA) suggested that we use 5 percent in our national analysis since it would better reflect the income effect (consumers having more money in their pockets to spend on driving) and not the price effect (consumers wanting to drive more because it costs less) associated with lower driving costs. Much of the literature we reviewed to inform our analysis of the rebound effect controls for income (since all sources of income, not just income associated with fuel savings, can influence VMT) and, therefore, only captures the price effect.

CFA also suggested that any additional driving due to the rebound effect increases consumer welfare and therefore the rebound effect should not be subtracted in the consumer pocketbook analysis. However, in both our proposed and final rules, we did not incorporate the rebound effect in our consumer payback analysis (i.e., we calculate the consumer payback associated with reference case VMT, which does not include rebound VMT). See RIA Chapter 5.5. As CFA recommends, we only considered the additional fuel consumption and fuel costs associated with rebound driving in our overall, national-level analysis of costs and benefits. Additionally, we quantify the value that consumers derive from additional rebound driving in our analysis of national-level costs and benefits.

The Defour Group suggested using an estimate of 20 percent or higher for the VMT rebound effect. The Defour Group cited potential methodological shortcomings in two studies that informed our analysis of the rebound effect (Greene and Small and Van Dender[29]); suggested that EPA should instead consider findings from studies evaluating the price elasticity of demand for gasoline; and further suggested that the magnitude of the rebound effect might increase rather than decrease in the future. The Defour Group also commented that Greene's study was not available for public review and that EPA relied solely on studies from Greene and Small and Van Dender in selecting the 10 percent value.

We found a number of errors and misrepresentations in the Defour Group's interpretation of Greene and Small and Van Dender's studies.[30] For example, the commenter suggests that

[29] While not specified in their comments, we assume the Defour Group is referring to the online version of Greene, David, 2012. "Rebound 2007: Analysis of U.S. light-duty vehicle travel statistics," *Energy Policy*, vol. 41, pp. 14-28 (which was publically available on the journal's website as of February 9, 2010) and Small, K. and K. Van Dender, 2007a. "Fuel Efficiency and Motor Vehicle Travel: The Declining Rebound Effect." *The Energy Journal*, vol. 28, no. 1, pp. 25-51. We referenced both studies in the NPRM and placed copies in the docket (EPA-HQ-OAR-2010-0799-0759 for Greene's paper and EPA-HQ-OAR-2010-0799-0755 for Small and Van Dender's paper).

[30] The examples included here are illustrative and are by no means exhaustive. There are a plentitude of errors and misrepresentations of equal magnitude throughout the Defour Group's comment. Additional examples include a statement, without citation, that Small and Van Dender updated their study and now find a 15% rebound effect; however Small and Van Dender have reported no such estimate. The Defour Group also states that Greene

Greene's study rejects the findings from Small and Van Dender's study, however, Greene's study actually provides broad confirmation of their work using a different dataset and method.[31] As another example, the Defour Group critiques Greene's purported use of gallon/mile as a surrogate for fuel costs whereas Greene actually used $/mile in his analysis. As yet another example, the Defour Group suggests that, in contrast to findings in Greene's study and to a certain extent in Small and Van Dender's study, the weight of literature supports the hypothesis that elasticities of VMT with respect to fuel prices and fuel efficiency are of equal and opposite magnitude, however, neither of the studies the Defour Group cited seems to support this claim.[32]

The Defour Group references findings in research from Spiller[33] as evidence that the rebound effect should be higher than 10 percent and compares these findings to Greene's analysis of the rebound effect. The findings in Spiller's research, however, are related to the price elasticity of demand for gasoline. This type of elasticity, while a useful point of comparison, is not appropriate for measuring the VMT rebound effect because it reflects consumer selection of vehicle fuel efficiency (both via vehicle choice as well as vehicle

---

finds that auto "owners do not reduce their driving when fuel costs rise", which is not true. Greene does not conclude that auto owners do not respond to changes in fuel costs. Greene is simply unable to find a statistically significant relationship between VMT and fuel efficiency (i.e., he is unable to find empirical evidence), but he goes on to evaluate the rebound effect by looking at VMT responsiveness to changes in fuel cost per mile rather than fuel efficiency and he produces statistically significant results (indicative that auto owners are responsive to fuel costs, but not necessarily fuel efficiency).

[31] For example, Greene states in the conclusion of his study, "The results obtained here with national time series data are quite consistent with Small and Van Dender's estimates using state level time series, cross sectional data." (pg. 27). Greene's inability to find a statistically significant elasticity of VMT with respect to fuel economy "is not new, having been previously reported by Small and Van Dender." (pg. 26). Greene goes on to explain on pg. 26, "What is new is the finding that the hypothesis that the elasticities of vehicle travel with respect to fuel price and fuel efficiency (gallons per mile) are equal, as predicted by theory, is now rejected by the national time series data." This hypothesis is mainstream, having been adopted by many modelers examining the rebound effect, not just Small and Van Dender (we discuss this topic in section 4.5 of the Joint TSD as a potential reason why rebound estimates in the literature may overestimate the magnitude if, for example, people are more responsive to fuel prices than to fuel efficiency).

[32] The first study they cited did not find evidence that a change in the price per mile of driving impacts VMT (Goldberg, Pinelopi, 1998, "The Effects of the Corporate Average Fuel Efficiency Standards in the US", *Journal of Industrial Economics*, vol. XLVI) (Docket EPA-HQ-OAR-2010-0799). There is no mention of rebound in the second study they cited as it focuses on willingness to pay for fuel efficiency, not VMT responsiveness to fuel efficiency or fuel prices (Bento et al., 2010, "Is There an Energy Paradox in Fuel Economy? A Note on the Role of Consumer Heterogeneity and Sorting Bias", Resources for the Future Discussion Paper available at http://www.rff.org/RFF/Documents/RFF-DP-10-56.pdf) (Docket EPA-HQ-OAR-2010-0799).

[33] Spiller, E. "Household Vehicle Bundle Choices and Gasoline Demand," Resources for the Future and Duke University, paper from January 2011availavble at http://fds.duke.edu/db/aas/Economics/phd/elisheba.spiller/files/Elisheba%20Spiller%20Job%20Market%20Paper.pdf and PowerPoint from July 2011 available at http://emf.stanford.edu/files/docs/322/SPILLER.pdf. (Docket EPA-HQ-OAR-2010-0799)

operation and maintenance) in addition to VMT.[34] Along these lines, the Defour Group cites two other studies (Busse et al.[35] and Sallee et al.[36]) that find fuel prices have a much stronger impact on consumer purchase of fuel efficient vehicles than previous studies have found, but again these findings are not directly relevant to estimating the VMT rebound effect since the rebound effect is a measure of the additional VMT as a result of increased fuel efficiency, which is a separate consumer behavior (modeled differently) than consumer choice of fuel efficiency. In addition, the Busse et al. and Sallee et al. studies draw their conclusions based on analysis of the used vehicle market, which may not behave in the same way as the new vehicle market.

The Defour Group also suggests that the magnitude of the rebound effect could increase if fuel prices rise in the future, since this will cause fuel costs to represent a greater share of household budgets, which in turn makes households more responsive to fuel costs. While this is not implausible, the same logic holds that the rebound effect would continue to decline if other driving costs (such as the time cost of driving associated with income and congestion levels, and costs of other vehicle ownership and operational categories such as insurance, maintenance, and tolls) increase enough to counteract the effect of higher fuel prices. Income is anticipated to increase in the future and, as we discuss in the Chapter 4.2.5.2 of the Joint TSD, Small and Van Dender (2007) and Hymel, Small, and Van Dender (2010) find that the rebound effect is more strongly dependant on income than on fuel costs.

With respect to the Defour Group's comment on the availability of Greene's study, EPA included in the NPRM docket the version that was accepted into the journal, *Energy Policy*, and published in early 2012.[37] This version was also available online at the journal's website as of February 2010. Finally, the Defour Group's assertion that EPA justified our selection of a 10

[34] We sought comment in the MYs 2012-2016 rulemaking on using the elasticity of demand for gasoline to estimate the VMT rebound effect. We received one comment during that rulemaking, from ICCT, that this elasticity should not be used to guide the choice of a value for the VMT rebound effect.

[35] Busse, M., Knittel, C., and Zettelmeyer, F.. "Pain at the Pump: The Effect of Gasoline Prices on New and Used Automobile Markets", September 2011. (Docket EPA-HQ-OAR-2010-0799)

[36]The authors of this study clearly note that it is preliminary and incomplete and request that it be cited only with permission. It is not clear if the Defour Group had permission to cite it in their comments. Sallee, J., West, S., and Fan, W., "The Effect of Gasoline Prices on the Demand for Fuel Economy in Used Vehicles: Empirical Evidence and Policy Implications," May 24, 2011, funded by the Energy Initiative at the University of Chicago and by the Keck Foundation of Macalister College. (Docket EPA-HQ-OAR-2010-0799).

[37] We included the following citation in the NPRM preamble (76 FR at 75126) and in Chapter 4.2.5.2 of the Draft Joint TSD:
Greene, David, "Rebound 2007: Analysis of National Light-Duty Vehicle Travel Statistics," February 9, 2010. This paper has been accepted for an upcoming special issue of Energy Policy, although the publication date has not yet been determined. (Docket EPA-HQ-OAR-2010-0799)

percent rebound value solely on the basis of two studies is not accurate, as we discuss above, in preamble section III.H.4.c, and at section 4.2.5.3 of the Joint TSD.

The Defour Group also suggests that there will be a potential delay in fleet turnover (i.e., the retirement of used vehicles and their replacement by new models) as a result of our rule, which the Defour Group refers to as "the clunker effect" in its comments. We discuss this topic (which is unrelated to the VMT rebound effect) in section III.H.11.a of the preamble. In brief, the effect of this rule on the use and scrappage of older vehicles is influenced by a number of factors, including the rule's impacts on vehicle prices, the fuel efficiency of new vehicle models, the fuel efficiency of used vehicles, and the total sales of new vehicles. If the value of fuel savings resulting from improved fuel efficiency to the typical potential buyer of a new vehicle outweighs the average increase in new models' prices, sales of new vehicles could rise, the used vehicle market may increase in volume as new vehicle buyers sell their older vehicles, and scrappage rates of used vehicles may increase slightly. This will cause both an influx of more efficient vehicles into the used vehicle market and an increase in the turnover of the vehicle fleet, thus accentuating the anticipated effect of the rule on fleet-wide fuel consumption and CO_2 emissions. The opposite scenario, as the commenter suggests, is also possible. Because we do not have good estimates of the relationships between the new and used vehicle markets, we have not attempted to estimate explicitly the effects of the rule on the used vehicle market, scrappage of older vehicles, and the turnover of the vehicle fleet. EPA's analysis of the effects of the rule on new vehicle sales, however, reasonably indicates that it is possible for the rule to increase vehicle sales through its role in promoting social learning, reducing risk and uncertainty for manufacturers, and promoting innovation (as discussed in section III.H.11.a of the preamble). Our response to this commenter on vehicle sales impacts is available in section 18.7 of this RTC document.

The International Council for Clean Transportation (ICCT) suggested we should rely solely on projected estimates of the VMT rebound effect that account for future incomes and fuel prices, which tend to be lower than 10 percent for the years covered by this rule. We recognize the merit of projected estimates of the VMT rebound effect that take into account future incomes, fuel efficiency, and fuel prices over the period impacted by our rulemaking, particularly since the recent studies ICCT cites (from Greene and from Small and Van Dender) have found evidence that the VMT rebound effect is declining over time (see Joint TSD section 4.2.5.2). However, as discussed above, we determined it was appropriate to consider projected estimates from recent studies as well as the larger body of literature on this topic, reflecting a range of different analytical methods and results, in selecting the most appropriate value to use in this rulemaking.

Plant Oil Powered Diesel Fuel Systems, Inc. (POP Diesel) cited a recent study in Germany (Frondel et al., 2011) based on household survey data as evidence that EPA had underestimated the VMT rebound effect. We focused on U.S.-based studies of the VMT rebound effect to inform our regulatory analysis because driver behavior in the U.S. may differ from driver behavior in other countries (e.g., there is likely to be less elastic demand for VMT in the U.S. than Germany because of longer driving distances and fewer transportation alternatives).[38] The declaration from Dr. Saunders that POP Diesel referenced in its comments also suggested that EPA relied too heavily on older analyses that use older data and that recent studies using recent data tend to show a rebound effect that is larger than 10 percent. As discussed above, we relied on a wide range of studies to inform our analysis, which were based on data that spanned multiple decades. Recent studies have actually found evidence that the rebound effect has declined in recent years and could be less than 10 percent in the years covered by our rule (as we discuss in preamble section III.H.4.c and Joint TSD Chapter 4.2.5.2). POP Diesel also suggested that EPA and NHTSA's uncertainty analysis was too narrow (referencing the declaration from Dr. Saunders which cites the agencies' range as 5-15 percent). EPA and NHTSA, however, conducted sensitivity and uncertainly analyses over a broader range of estimates of the direct VMT rebound. EPA's sensitivity analysis covered a range of 0-20 percent (see EPA RIA section 4.5.1) and NHTSA's uncertainty analysis, which we reference in the introduction to preamble III.H, covered a range of 5-30 percent. Even assuming the higher end of these ranges for rebound, EPA would not have changed the standards. Among other things, the benefits of the rule would still vastly exceed the costs.

POP Diesel also suggested that EPA should account for the energy and GHG emissions impact associated with the so-called "indirect rebound effects" (distinct from the VMT rebound effect) of consumers using the increased disposable income they gain from fuel savings to purchase goods and services that were produced with energy or that consume energy. We are not aware of any data on the magnitude of potential indirect rebound effects, if any, from our rule. Research on indirect rebound effects is nascent and POP Diesel did not provide analysis in its comments indicating an appropriate method or value to use to estimate these putative effects from our rule.[39] We therefore believe it is unreasonable to consider potential indirect rebound effects, if any, from our rule based on the commenter's speculative assertions. Furthermore, as noted in the previous footnote, there are additional benefits to consumers associated with increased consumption of goods and services, which would be important to consider if we were

[38] Frondel, Manuel and Vance, Colin, 2011. "Re-Identifying the Rebound – What About Asymmetry?", Ruhr Economic Papers #276. (Docket EPA-HQ-OAR-2010-0799)

[39] The declaration from Dr. Saunders that POP Diesel referenced in their comments cited only one study on indirect rebound effects (Druckman et al., 2011 , "Missing carbon reductions? Exploring rebound and backfire effects in UK households", *Energy Policy*, vol. 39, pp. 3572-3581.) (Docket EPA-HQ-OAR-2010-0799). While this UK-based study could offer insights into how to estimate indirect rebound effects, the method is not appropriate for use in our rule for many reasons. First, the U.S. economy and consumer behavior is likely to differ from other countries (e.g., Americans have different product and service preferences and our products and services have different levels of embedded energy). Similar data and models may not exist to replicate the UK study in a U.S.-context. Second, the study is designed to examine behavioral strategies (e.g., lowering thermostats, reducing food waste, and biking instead of using a car) rather than improving technology. Among other things, the study does not consider capital expenditures associated with energy savings that could dampen any increase in disposable income (e.g., our rule increases the cost of new vehicles, which decreases disposable income). Third, the study does not consider the potential for economic restructuring in response to decreased energy consumption (i.e., it does not consider "general equilibrium" effects), which could lead to either lower or higher energy consumption as a result of our rule. Fourth, the authors recognize that there is a major limitation of the study: they have only a very small number of expenditure categories in their model and there is considerable disparity in GHG intensities of commodities within each category (p. 3578). Finally, the authors do not attempt to quantify the additional benefits to consumers associated with increased consumption of goods and services, which would be important to consider if we were assessing the overall costs and benefits associated with potential indirect rebound effects from our rule.

assessing the overall costs and benefits associated with potential indirect rebound effects from our rule.

POP Diesel also commented that there is a potential for consumers to shift to larger, more powerful vehicles that are less fuel-efficient in response to our standards. POP Diesel described this as a direct rebound effect; however, since this behavior does not influence VMT, we consider it to be another type of indirect effect unrelated to the direct VMT rebound effect. As discussed above, we are not aware of any data on the magnitude of potential indirect rebound effects from this rule, let alone whether they would be significant. POP Diesel's specific assertion that people will spend some of the money they expect to gain from fuel savings on larger, more powerful vehicles is highly uncertain. It assumes that not only would consumers not be put off by what are likely to be higher vehicle prices, but would purchase disproportionate numbers of the more expensive large footprint vehicles because of the perceived fuel savings. First, as we discuss in preamble III.H.1.a and in response to comments in section 18.1, predicting consumer preferences (and therefore the future fleet mix) is challenging. It is difficult to isolate the influence of fuel efficiency standards from other factors (e.g., fuel prices, consumer taste, demographics) on consumer vehicle choice. It is not yet clear whether vehicle choice models can provide reasonable predictions of future fleet mixes with and without our rule. While it is possible people will buy bigger, more powerful cars in response to our rule, it is also possible they will do the opposite. Comments from the Institute for Policy Integrity suggest our rule could actually make fuel-efficient vehicles more popular and that we have therefore underestimated the benefits of our rule (see its discussion of "positionality" and the "bandwagon effect" in EPA-HQ-OAR-2010-0799-9480-A1, pp. 19-21). Second, the commenter does not seem to account for the fact that our rule sets attribute-based standards (whereby every size vehicle has an emissions target), which reduces incentives to change the size distribution of vehicles in the fleet (see preamble section II.C and joint TSD chapter 2.1 and 2.2).[40] In late-filed comments on July 31, 2012, POP Diesel submitted a study from Whitefoot and Skerlos[41] claiming it as evidence that our rule will lead to vehicle upsizing that results in a large rebound

[40] Ironically, the Knittel study cited in the declaration from Dr. Saunders that POP Diesel submitted with their comments, and cited again by POP Diesel in their late-filed comment of July 31, 2012, maintains that manufacturers will have to downsize their fleets to meet even the MY 2016 standards (Knittel, Christopher R., 2011, "Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector." *American Economic Review*, 101(7): 3368–99) (Docket EPA-HQ-OAR-2010-0799). See Knittel at 3388. Although EPA disagrees (as explained at RIA 1-40 and section 18.1 of this RTC, this rule includes costs of maintaining all vehicle attributes of the existing fleet, including size, weight, torque, and horsepower), this study appears to contradict POP Diesel's ultimate point. Furthermore, the Knittel study does not discuss rebound effects, so EPA does not see that the study can properly be cited as support for a quantified rebound effect between 1980-2006 as suggested in the Saunders declaration.

[41] Whitefoot, Kate and Skerlos, Steven, 2012. "Design Incentives to Increase Vehicle Size Created from the U.S. Footprint-Based Fuel Economy Standards," *Energy Policy* 41, pp. 402-411 (EPA Docket EPA-HQ-OAR-2010-0799).

effect that negates much, if not all, of the estimated fuel and GHG savings. This study does not deal with rebound effects (nor does it purport to), and EPA disagrees that the standards will result in a significant upsizing of the fleet in any case.[42] We respond to comments on car and light truck footprint curve shapes and level of the standards, including comments from Whitefoot and Skerlos and other commenters who cite this study, in section 2.2.2 of the RTC (see also a summary of our response in the previous footnote).

Our analysis of this rule has shown that it is possible to maintain vehicle characteristics (including safety, size, and horsepower) and improve fuel economy (see EPA RIA at 1-40). It should also be possible, though of course with increased cost, to have more fuel economy as well as more size, safety, and/or horsepower. Nothing in our rule precludes these changes in vehicles. We have assumed, however, that the fleet mix will not need to change in response to this rule since we have factored in the cost of preserving the vehicle utility present in the existing fleet. If, as POP Diesel suggests, changes occur in response to market forces, it is reasonable to assume that those changes will reduce the costs or increase the benefits associated with consumer ownership of the vehicles. We will review the environmental implications of any changes in the vehicle fleet during the mid-term evaluation (see preamble section I.B.5 for information on the mid-term evaluation).

[42] In its late-filed comments, POP Diesel states that the Whitefoot and Skerlos study posits a rebound effect of at least 71 percent will ensue and that the rebound effect will more likely than not be above 100 percent, producing a backfire condition. In fact, the Whitefoot and Skerlos study does not discuss any type of rebound effect, much less the quantified values attributed to the study by the commenter. Rather, the primary focus of the study is on issues of curve shape and standard stringency. The authors analyze the 2012-2016 CAFE standards (not the standards proposed in this rule), and do so assuming different inputs than the agencies actually used in the MYs 2012-2016 rule regarding the baseline fleet, the cost and efficacy of potential future technologies, and the relationship between vehicle footprint and fuel economy. Were the agencies to use the Whitefoot and Skerlos methodology with the actual inputs to the MYs 2012-2016 rules, it is likely that different results would be obtained from those in the Whitefoot and Skerlos study. We have responded to these issues in detail in section 2.4 of the Joint TSD, RTC 2.2.2, and preamble section II.C. We also explain that the gradual extension of the cutpoint in the right hand portion of the truck curve does not create an incentive to upsize. See preamble section II.C.5.b and Joint TSD section 2.5.2. Thus, this study does not deal with rebound effects at all (nor does it purport to), and EPA disagrees that the standards will result in a significant upsizing of the fleet in any case. We therefore believe that POP Diesel has significantly mischaracterized the Whitefoot and Skerlos study, and that it does not support the commenter's assertions regarding rebound effects. We also note that the other study submitted by POP Diesel, by Knittel, postulates a reverse effect: that manufacturers will necessarily have to downsize the fleet to meet the standards. Although we disagree (see footnote discussing the Knittel study, which precedes the previous footnote citing the Whitefoot and Skerlos study), the study is illustrative of the range of views in the literature on the potential effects of the standards.

16. Analysis of GHG Emissions Reductions and Their Associated Effects

16.1. Impact on GHG emissions

Organizations Included in this Section

Alliance of Automobile Manufacturers
National Wildlife Federation (NWF)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Union of Concerned Scientists (UCS)
U.S. Coalition for Advanced Diesel Cars
Weiner, L.

Organization: Alliance of Automobile Manufacturers

Weighted Average CO_2 Content for Diesel Fuel [EPA-HQ-OAR-2010-0799-9487-A1, p.91]

Footnote 164 on page 74933 of the NPRM states that the Agencies used 10,200 grams/gallon as an estimated weighted average CO_2 content for diesel fuel. This is not consistent with the 2012-16MY rule, where the Agencies had used the estimated weighted average CO_2 content for diesel fuel of 10,180 grams/gallon. (See footnote 20 of the 2012-2016 Light-Duty Vehicle Greenhouse Gas and CAFE rulemaking; 75 Fed. Reg. 25324, 25330 (May 7, 2010)) To stay consistent, 10,180 should be used in the 2017-25MY rule. [EPA-HQ-OAR-2010-0799-9487-A1, pp.91-92]

Organization: National Wildlife Federation (NWF)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 29.]

Taken together with light- and heavy-duty standards being implemented now, the proposed standards will cut carbon pollution by over 650 million metric tons by year by 2030, about 10 percent of the total carbon pollution today. This is a historic step forward to combat our climate challenge.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 123-124.]

Finally these standards will keep 280 million metric tons of carbon pollution out of the atmosphere. That's the equivalent of shuttering 72 coal-fired power plants for one year.

Organization: Union of Concerned Scientists (UCS)

Environmental Benefits

The proposed standards will also deliver significant reductions in the greenhouse gas emissions that cause climate change. Based on UCS analysis, the 2017-2025 standards would reduce global warming pollution by as much as 290 million metric tons (MMT) in 2030 alone. This is equivalent to shutting down 62 (600 megawatt) coal-fired power plants for an entire year. When combined with the final standards for MYs 2012-2016, the National Program will reduce U.S. greenhouse gas emissions by more than 630 MMT in 2030. [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 216.]

Based on UCS analysis, the 2017 through 2025 standards alone would reduce global warming pollution by as much as 290 million metric tons in 2030. This is equivalent to shutting down 62 600-mega watt coal-fired power plants for an entire year. Cumulatively, this program will reduce emissions by more than 1.7 billion metric tons through 2030.

Organization: U.S. Coalition for Advanced Diesel Cars

The success of the new rules ultimately will be judged by reductions in real-world petroleum barrels and real-world GHG tons from 2017 through 2025. [NHTSA-2010-0131-0246-A1, p.2]

Organization: Weiner, L.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 106.]

In relation to carbon pollution, the reduction of carbon pollution by implementing these standards, as you well understand, is another significant benefit. Cutting carbon pollution by 2 billion metric tons is equivalent to the annual emissions from 474 coal-fired power plants. And as I'm sure you are aware, coal-fired power plants are very high makers of carbon pollution. This is a considerable reduction of a dangerous greenhouse gas. The reality, as we know, is that global efforts in reducing climate change have been slow.

Response:

EPA appreciates the many commenters (NWF; Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council; UCS; Weiner, L.) who recognized the significant GHG reductions that we expect from this rule. We agree with the U.S. Coalition for Advanced Diesel Cars that the success of our rule is tied to the real-world fuel and GHG savings it will achieve, which we have estimated using best available methods.

With respect to the Alliance of Automobile Manufacturer's comment, the CO_2 content for diesel fuel in EPA's analysis is consistent with the MYs 2012-2016 rulemaking value (10,180 grams/gallon) (see section 4.3.6 of the RIA). The 10,200 gram/gallon value presented in footnote 164 on page 74933 of the NPRM was an approximate value.

16.2. Climate Change Impacts from GHG Emissions and Other Climate-Forcing Agents

Organizations Included in this Section

Adams, G.
American Medical Association of California
Axford, H.
Cafagna, R.
Ceres
Cuenca, M.
Environmental Defense Fund (EDF)
Faria, R.
Haroldson, C.
Institute for Energy Research (IER)
International Council on Clean Transportation (ICCT)
Lennon, S.
Links, W.
Manufacturers of Emission Controls Association (MECA)
National Wildlife Federation (NWF)
Parker, M.
Paul, M.
Pearce, F.
Smith, G.
Steffanoff, N.
Steyn, R.
Sullivan, T.
Union of Concerned Scientists (UCS)
Van Coppenolle, J. and L.

Organization: Adams, G.

I do care about cutting US dependence on fossil fuel in general because I do NOT like what global warming is doing to the weather. I am afraid that drought, flood, high winds, and crazy weather in general are likely to drive the price of food sky-high. [EPA-HQ-OAR-2010-0799-1550-A1, p. 1]

Organization: American Medical Association of California

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 46.]

Without strong action to reduce greenhouse gases, rising temperatures due to climate change will lead to even higher suffering from increases in ozone pollution, pollen production, expanded heat waves, devastating wildfires and accompanying wildfire smoke exposures. These will also impact our most vulnerable communities the hardest.

Organization: Axford, H.

Lastly, EPA claims these regulations are necessary because of carbon dioxide emissions. But EPA admits that this rule will, at most, reduce global temperature by 0.0184 °C by 2100. Two hundredths of a degree Celsius is not enough to have an impact on the climate and therefore, EPA cannot claim any climate benefits from this mandate. [EPA-HQ-OAR-2010-0799-9149-A1, p. 2]

Organization: Cafagna, R.

Lastly, EPA claims these regulations are necessary because of carbon dioxide emissions. But EPA admits that this rule will, at most, reduce global temperature by 0.0184 °C by 2100. Two hundredths of a degree Celsius is not enough to have an impact on the climate and therefore, EPA cannot claim any climate benefits from this mandate. [EPA-HQ-OAR-2010-0799-11689-A1, p. 2]

Organization: Ceres

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 75.]

Strong standards will also serve to mitigate climate change risks and the very significant economic as well as environmental and human disruption that a changing climate will likely cause -- and, in fact, is already causing.

Organization: Cuenca, M.

Lastly, the EPA claims these regulations are necessary because of carbon dioxide emissions. However the EPA admits this rule will, at best, reduce global temperature by 0.0184 °C by 2100. Less than two hundredths of a single degree Celsius is not enough to have an impact on the climate therefore, the EPA should not claim any climate benefits from this silly mandate. [EPA-HQ-OAR-2010-0799-10142-A1, p. 2]

Organization: Environmental Defense Fund (EDF)

Our petroleum addiction has significant environmental consequences. The combustion of oil in our nation's fleet of light-duty vehicles emits about 20 percent of total U.S. greenhouse gases emissions. Carbon dioxide and other potent heat-trapping gases contribute to climate change, which can threaten us at home and abroad. [EPA-HQ-OAR-2010-0799-9519-A1, p. 2]

The U.S. Global Change Research Program has found that climate changes "are already affecting water, energy, transportation, agriculture, ecosystems, and health." Its 2009 Assessment predicts that water resources will be further stressed, crop and livestock production will be increasingly challenged, coastal areas will be increasingly threatened, and human health will be impacted due to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. [EPA-HQ-OAR-2010-0799-9519-A1, p. 2]

The number of people at risk due to droughts will increase because many low-rainfall areas are projected to receive less rain and because rising temperatures and evaporation will cause soils to dry. Seasonal snow packs in the Western United States will shrink, endangering water supplies relied upon by Western communities. The number and extent of wildfires, insect outbreaks, and tree mortality in the interior West, the Southwest, and Alaska will likely expand. And damaging impacts outside of the United States may harm our trade, humanitarian, and national security interests. [EPA-HQ-OAR-2010-0799-9519-A1, p. 2]

Natural disasters in 2011 wielded the costliest toll in history — a massive $380 billion worth of losses from earthquakes, floods, tornadoes, hurricanes, wildfires, tsunamis and more. And that figure does not include the expenses associated with sickness or injuries triggered by the disasters.10 [EPA-HQ-OAR-2010-0799-9519-A1, p. 2]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 287-288.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 173.]

With respect to climate security, the combustion of oil in our nation's fleet of passenger vehicles accounts for about 20 percent of U.S. greenhouse gas emissions. Together with the first-phase standards, the proposed standard under consideration will cut heat-trapping carbon dioxide pollution by over 6 million metric tons.

These emission reductions are an important part of a national and global effort to ward off the worst consequences of climate change. The U.S. Global Change Research Program has found that climate change is already affecting water, energy, transportation, agriculture ecosystems and health.

Organization: Faria, R.

Lastly, EPA claims these regulations are necessary because of carbon dioxide emissions. But EPA admits that this rule will, at most, reduce global temperature by 0.0184 °C by 2100. Two hundredths of a degree Celsius is not enough to have an impact on the climate and therefore, EPA cannot claim any climate benefits from this mandate. [EPA-HQ-OAR-2010-0799-9834-A1, p. 2]

Organization: Haroldson, C.

Climate change concerns are becoming increasingly debunked and should no longer be a concern. [EPA-HQ-OAR-2010-0799-11137-A1, p. 1]

Organization: Institute for Energy Research (IER)

This comment explains that EPA, and by extension NHTSA, fail to justify increasing the greenhouse gas emissions standards for light-duty vehicles. EPA's rule does not affect the pace of climate change in any meaningful way. Therefore, this rule is fatally flawed or the endangerment finding is fatally flawed. After all, EPA is regulating greenhouse gases in order to reduce climate change. [EPA-HQ-OAR-2010-0799-9573-A1, p. 1]

EPA fails to provide any justification to regulate greenhouse gas emissions from light-duty vehicles. In fact, EPA's proposed rule clearly demonstrates that greenhouse gas emissions from light-duty vehicles do not "endanger public health or welfare" as required by section 202 of the Clean Air Act. For these reasons, EPA should not regulate greenhouse gases using the Clean Air Act. [EPA-HQ-OAR-2010-0799-9573-A1, p. 23]

Organization: International Council on Clean Transportation (ICCT)

18. Black carbon is an important climate-forcing agent. EPA should regulate black carbon indirectly via stringent limits on particulate matter and expedite the congressionally mandated black carbon study report followed by all appropriate steps to regulate this pollutant as a climate-forcing agent. [EPA-HQ-OAR-2010-0799-9512-A1, p. 4]

18) Black Carbon

Black carbon is the light-absorbing fraction of particulate matter that causes warming. In January 2012 an article published in the journal Science found emission standards for new light- and heavy-duty vehicles, as well as scrappage of high emitting vehicles, to be one of a handful of measures to control black carbon that are necessary to guarantee stabilization of global average temperatures no greater than 2°C above temperatures in the pre-industrial period.[81] [EPA-HQ-OAR-2010-0799-9512-A1, p. 51]

EPA acknowledges the climate benefits of reductions in particulate matter emissions that would be generated by this rule, though they would be smal1.82 However, EPA does not evaluate the concomitant reductions in black carbon, nor does it propose to regulate black carbon. Previously the agency cited its concern that no definitive scientific assessment on the climate impacts of black carbon had been made.83 EPA has been directed by Congress to conduct a review of black carbon climate science to be completed in 2010, but this is now overdue and remains unpublished. [EPA-HQ-OAR-2010-0799-9512-A1, p. 51]

Other actions on black carbon are worth noting. In December 2010, the executive body of the Convention on Long Range Transport of Air Pollution directed its Working Group on Strategies and Review to consider the inclusion of black carbon in the revision of the Gothenburg Protocol.[84]In May 2011 the Arctic Council put forward an assessment of emissions and mitigation options for control of black carbon climate impacts on the Arctic. In June 2011, the

International Maritime Organization adopted a workplan to investigate the definition, measurement, and control options for black carbon. In November 2011, the Arctic Monitoring and Assessment Program published a report on the impact of black carbon on Arctic Climate. And in January 2012, CARB issued a staff report that captures the current state of scientific knowledge and remaining areas of investigation for black carbon.[85] These actions reflect a growing international scientific and policy interest in identifying mechanisms to regulate the climate impacts of black carbon. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 51-52]

There is reason to believe that black carbon emissions from current on-road vehicles have been underestimated. Testing conducted by EPA and CARB staff of PFI engines caused an upward revision of emission factors for PM in the California emissions inventory from less than 1 mg per mile to 4 mg per mile.[86]This suggests that black carbon emissions have also been underestimated, although speciation of these emissions was not conducted. High cold start emissions contributed the bulk of this increase, but oil burning and engine degradation also contribute. According to our calculations, a light-duty vehicle emitting on average 0.004 g PM/mile would represent approximately 2.4 g CO_2-eq/mile black carbon emissions assuming 75% of PM is black carbon and the GWP-100 value, is 800.[EPA-HQ-OAR-2010-0799-9512-A1, p. 52]

Both the US EPA and CARB have regulatory provisions for non-CO_2 climate forcing agents, such as methane, nitrous oxide, and hydrofluorocarbons. The IPCC in its Fourth Assessment Report quantified estimated that the radiative forcing of black carbon ranks third among the climate pollutants. Meanwhile, research conducted more recently by Ramanathan and Carmichael concluded that IPCC estimates of radiative forcing are overly conservative, putting black carbon second after carbon dioxide in terms of global contribution to radiative forcing.[87] From this perspective, black carbon deserves greater priority than other climate forcing agents currently regulated by EPA. [EPA-HQ-OAR-2010-0799-9512-A1, p. 52]

We recognize that EPA must initiate a process to bring black carbon into the basket of regulated climate forcing agents, so regulation under this rulemaking may be premature. In light of this, we strongly urge the agency to consider (a) regulating black carbon indirectly via stringent limits on particulate matter in future rulemakings; and (b) expeditiously finalizing the congressionally mandated black carbon study report to inform future direct regulation of this pollutant. [EPA-HQ-OAR-2010-0799-9512-A1, p. 52]

---

81 (Shindell et al, 2012)

84 http://www.unece.org/fileadmin/DAM/env/documents/2010j eb/ eb/ eb%20decisions/Decision_2 010.2.e.pdf

85 CARB. 2011 Appendix U Proposed Technical Support Document: LEV III Climate Change Impacts of Black Carbon Particles. Sacramento, CA: California Air Resources Board. November, 2011. See http://www.arb.ca.govjregactj2012jleviiighg2012jlevappu.pdf

86 CARB, 2012

87 Dr. V. Ramanathan and G. Carmichael, 2008

Organization: Lennon, S.

EPA cannot claim any climate benefits from this mandate. [EPA-HQ-OAR-2010-0799-9019-A1, p. 1]

Organization: Links, W.

Lastly, EPA claims these regulations are necessary because of carbon dioxide emissions. But EPA admits that this rule will, at most, reduce global temperature by 0.0184 °C by 2100. Two hundredths of a degree Celsius is not enough to have an impact on the climate and therefore, EPA cannot claim any climate benefits from this mandate. [EPA-HQ-OAR-2010-0799-10348-A1, p. 2]

Organization: Manufacturers of Emission Controls Association (MECA)

There is a significant linkage between ground level ozone concentrations and climate change impacts. One example was detailed by a group of researchers from the United Kingdom in a 2007 *Nature* publication. In this work, ground-level ozone was shown to damage plant photosynthesis resulting in lower carbon dioxide uptake from plants that have been exposed to higher levels of ozone. Other studies have shown that increasing average annual temperatures are likely to result in even higher levels of ozone in the environment. Emission reductions aimed at lowering ambient ozone levels, such as lower emissions of volatile organic compounds (VOCs) and NO_x, will have a positive impact on climate change, as well as human health. Policies that aim to reduce ambient ozone levels may also become more necessary and important to either mitigate the climate change impacts of ground level ozone or to mitigate higher ozone levels that result from climate change. [EPA-HQ-OAR-2010-0799-9452-A3, p.4]

Black carbon is a major component of particulate matter emissions from mobile sources and is believed to have a significant net atmospheric warming effect by enhancing the absorption of sunlight. Black carbon is a mix of elemental and organic carbon emitted by fossil fuel combustion, bio-mass burning, and bio-fuel cooking as soot. Black carbon is a dominant absorber of visible solar radiation in the atmosphere. Anthropogenic sources of black carbon are transported over long distances and are most concentrated in the tropics where solar irradiance is highest. Because of the combination of high absorption, a regional distribution roughly aligned with solar irradiance, and the capacity to form widespread atmospheric brown clouds in a mixture with other aerosols, emissions of black carbon are thought to be the second strongest contribution to current climate change, after CO_2 emissions. [EPA-HQ-OAR-2010-0799-9452-A3, p.5]

According to scientists at the Scripps Institute of Oceanography and University of Iowa, soot and other forms of black carbon could have as much as 60% of the current global warming effect of carbon dioxide. Black carbon plays a major role in the dimming of the surface and a correspondingly large solar heating of the atmosphere. For example, the retreat of the Himalayan-Hindu Kush glaciers is one of the major environmental problems facing the Asian region. The glacier retreat has accelerated since the 1970s and several scientists have speculated that solar heating by soot in atmospheric brown clouds and deposition of dark soot over bright snow surfaces may be an important contributing factor for the acceleration of glacier retreat. A recent study published in a 2009 issue of *Nature Geoscience* (vol. 2, 2009) by researchers from the NASA Goddard Institute and Columbia University found that black carbon is responsible for 50% of the total Arctic warming observed from 1890 to 2007 (most of the observed Arctic warming over this timeframe occurred from 1976 to 2007). [EPA-HQ-OAR-2010-0799-9452-A3, p.5]

It is estimated that 70% of the black carbon emissions from mobile sources are from diesel-fueled vehicles, with the assumption that 40% of gasoline PM is black carbon and 60% of diesel PM is black carbon. Up to 25% of the carbon footprint of a heavy-duty diesel truck is associated with black carbon exhaust emissions. Since black carbon particles only remain airborne for weeks at most compared to carbon dioxide, which can remain in the atmosphere for more than a century, removing black carbon would have an immediate benefit to both global warming and public health. The black carbon concentration and its global heating will decrease almost immediately after reduction of its emission. For these reasons and the growing body of scientific evidence that links black carbon emissions with climate change, MECA believes that EPA should include black carbon emissions as part of its overall greenhouse gas emission control strategy. [EPA-HQ-OAR-2010-0799-9452-A3, p.5]

Black carbon from diesel vehicles can be significantly reduced through emission control technology that is already commercially available. High efficiency diesel particulate filters (DPFs) on new and existing diesel engines provide nearly 99.9% reductions of carbon emissions. During the regeneration of DPFs, captured carbon is oxidized to CO_2 but this filter regeneration still results in a net climate change benefit since global warming potential of black carbon has been estimated to be as high as 4,500 times higher than that of CO_2 on a per gram of emission basis. To meet EPA's 2007-2010 heavy-duty engine PM standards, essentially all new, on-road heavy-duty diesel engines are now equipped with high efficiency DPFs. It is estimated that the installation of DPFs will reduce PM emissions from U.S. heavy-duty diesel vehicles by 110,000 tons per year. Current California and EPA light-duty emission standards for diesel particulate matter also require the use of a high efficiency DPF on new light-duty diesel vehicles. [EPA-HQ-OAR-2010-0799-9452-A3, pp.5-6]

Because older diesel engines emit significant amounts of PM, there are also significant opportunities to reduce black carbon emissions through diesel retrofit programs that make use of retrofit DPF technology. The number of vehicles retrofitted, the number of programs, and the interest in new programs for DPFs have grown significantly over the past few years with more than 250,000 DPFs installed as retrofits to date in a variety of world markets. Retrofit filters can provide large benefits in human health through reductions in diesel PM and climate change benefits through reductions in black carbon emissions on both existing, on-road and off-road diesel engines. California has already tackled black carbon emissions from existing mobile sources through its ambitious Diesel Risk Reduction Plan and their associated regulatory initiatives that target the reduction of diesel particulate emissions from existing diesel engines over the next fifteen years. In many of these California regulatory programs existing diesel engines will need to be retrofit with high efficiency DPFs or replaced/repowered with engines that are equipped with high efficiency filters by OEMs. Similar regulatory programs could be implemented within other states or by EPA to reap the public health and climate change co-benefits associated with reductions in black carbon emissions. Incentive funding programs like California's Carl Moyer program or the federal Diesel Emission Reduction Act (DERA) also can be used as a strategy for mobile source retrofit programs at the state or federal level that target black carbon reductions. Incentive funds for filter retrofits might also be generated by a state or national greenhouse gas cap-and-trade programs. [EPA-HQ-OAR-2010-0799-9452-A3, p.6]

In the case of gasoline vehicles, additional climate change benefits could be obtained by lowering federal gasoline fuel sulfur levels to enable the use of lean NO_x adsorber catalysts on gasoline lean-burn engines. [EPA-HQ-OAR-2010-0799-9452-A3, p.6]

Organization: National Wildlife Federation (NWF)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 28-29.]

Carbon pollution is warming our climate locally and worldwide. These changes threaten people and global security right now, and they are a most profoundly threatening force against the future of wildlife. Rising temperatures, flood, fires, droughts and ecosystem alterations are creating direct habitat loss, increased invasive species and other threats for wildlife species, and many of those species may not adapt.

Organization: Parker, M.

Lastly, EPA claims these regulations are necessary because of carbon dioxide emissions. But EPA admits that this rule will, at most, reduce global temperature by 0.0184 °C by 2100. Two hundredths of a degree Celsius is not enough to have an impact on the climate and therefore, EPA cannot claim any climate benefits from this mandate. [EPA-HQ-OAR-2010-0799-9017-A1, p. 2]

Organization: Paul, M.

Lastly, EPA claims these regulations are necessary because of carbon dioxide emissions. But the EPA **ADMITS•• that this rule will, at most, reduce global temperature by 0.0184°C by 2100... [EPA-HQ-OAR-2010-0799-9027-A1, p. 2]

THAT'S JUST TWO **HUNDREDTHS** OF A DEGREE CELSIUS !!! [EPA-HQ-OAR-2010-0799-9027-A1, p. 2]

Therefore, EPA CANNOT CLAIM any appreciable climate benefits from this mandate. Just 2/100ths of a degree Celsius IS ••NOT•• ENOUGH TO HAVE AN IMPACT ON THE CLIMATE OF THE EARTH AND... [EPA-HQ-OAR-2010-0799-9027-A1, p. 2]

Organization: Pearce, F.

The EPA claims these regulations are necessary because of carbon dioxide emissions. Global Warming has been exposed to be nothing but a scam created through falsified data. Even then the EPA admits that the additional regulations would reduce global temperature minimally at best. [EPA-HQ-OAR-2010-0799-10343-A1, p. 1]

Organization: Smith, G.

'Reduce carbon dioxide pollution by over 6 billion metric tons over the life of the program equivalent to the emissions from the United States in 2010.' Who cares? CO_2 is not a problem. It has zip to do with global warming and our air is more pure than it has been for 200 years. [EPA-HQ-OAR-2010-0799-8438-A1, p. 1]

Organization: Steffanoff, N.

Lastly, EPA claims these regulations are necessary because of carbon dioxide emissions. But EPA admits that this rule will, at most, reduce global temperature by 0.0184 °C by 2100. Two hundredths of a degree Celsius is not enough to have an impact on the climate and therefore, EPA cannot claim any climate benefits from this mandate. [EPA-HQ-OAR-2010-0799-9335-A1, p. 2]

Organization: Steyn, R.

* EPA claims its proposed increase is necessary to reduce carbon dioxide emissions, supposedly to reduce global warming. Again, EPA has NO statutory authority to regulate greenhouse gases such as carbon dioxide, which is not a pollutant and indeed is vital to the biosphere's life cycle. Moreover, EPA admits that this rule will, at most, reduce global temperature by 0.0184 °C by 2100. Two hundredths of a degree Celsius is not enough to have an impact on the climate. Therefore, EPA cannot claim any climate benefits from this mandate. [EPA-HQ-OAR-2010-0799-8724-A1, p. 2]

* The very scientific basis upon which EPA bases its illegal rule-making to reduce greenhouse gases is under increasing challenge. According to a recent editorial in the Wall Street Journal signed by a two dozen respected, senior scientists and engineers, "...a large and growing number of distinguished scientists and engineers do not agree that drastic actions on global warming are needed." [EPA-HQ-OAR-2010-0799-8724-A1, p. 2]

Organization: Sullivan, T.

Lastly, EPA claims these regulations are necessary because of carbon dioxide emissions. But EPA admits that this rule will, at most, reduce global temperature by 0.0184 °C by 2100. Two hundredths of a degree Celsius is not enough to have an impact on the climate and therefore, EPA cannot claim any climate benefits from this mandate. Besides, the theory of global warming is a failure, since none of their predictions are coming true. Not one. CO_2 is harmless, and is in fact beneficial to plant life, and thus to all animal life including mankind. [EPA-HQ-OAR-2010-0799-10341-A1, p. 2]

Organization: Union of Concerned Scientists (UCS)

Finally, strong standards will help reduce the heat-trapping emissions that cause global warming. Current and projected climate change impacts pose significant risks to public health, the economy, and the environment. Delaying action now and waiting for the future before initiating accelerated action to reduce global warming emissions would be more costly than initiating action now. [EPA-HQ-OAR-2010-0799-9713-A1, p. 2]

Organization: Van Coppenolle, J. and L.

Climate change, as you at the EPA should well know, is not just theory and not a diabolical scheme on the part of climate scientists to punish corporations. It is a threatening reality that should have been vigorously addressed a decade or more ago. [EPA-HQ-OAR-2010-0799-1284-A1, p. 1]

You at the EPA have the opportunity to address a major component of climate change with the proposed new standards. Please take this opportunity to do as much as reasonably possible to mitigate that phenomenon. [EPA-HQ-OAR-2010-0799-1284-A1, p. 1]

Response:

Commenters in this section fall into three categories, one supportive of the rule's impact on reducing future climate change, one discussing the role of black carbon and other non-GHG forcing agents in climate change, and one dismissive of the rule either because the magnitude of the estimated impacts are small or because of doubts regarding the science underlying those impacts. Each category will be addressed in turn.

The EPA agrees with the commenters who support the benefits of the rule. We agree with Ceres, EDF, NWF, UCS, the Van Coppenolles, and Weiner that these standards will serve to mitigate climate change risks by reducing emissions of the greenhouse gases which are reasonably anticipated to endanger human health and welfare. We also agree with the American Medical Association that certain groups such as children, the elderly, and the poor are most vulnerable to climate-related health effects.

Issues regarding black carbon were raised by ICCT and MECA. These organizations urge the regulation of black carbon (potentially through limits on PM) and request the expediting of the black carbon report to congress. Since the proposed rule, EPA has recently released a Report to Congress addressing black carbon.[43] EPA continues to recognize that black carbon is an important climate forcing agent and takes very seriously the emerging science on black carbon's contribution to global climate change in general and the high rates of observed climate change in

[43] EPA, March 2012. *Report to Congress on Black Carbon* (EPA-450/R-12-001) available at http://epa.gov/blackcarbon

the Arctic in particular. See generally 77 FR at 38991-993 (June 29, 2012) (proposal for revised PM NAAQS discussing effects of black carbon on climate). However, issues of control of black carbon are beyond the scope of this rulemaking, which implements section 202 (a) of the CAA and focuses on control of the vehicular GHG emissions of CO_2, CH_4, N_2O and HFCs. MECA also mentioned the effects of NOx on climate. As discussed above, changes in NOx emissions are included as an input into the MAGICC model. However, the effects due to NOx changes alone have not been isolated, and because NOx emissions lead to decreased levels of methane in addition to increased levels of ozone, the net effect on climate of changes in NOx emissions is unclear.

A number of commenters criticized the rules. The most common criticism was that because the climate impacts were small, that two hundredths of a degree Celsius is not enough to have an impact on the climate (Axford, Cafagna, Cuenca, Faria, Lennon, Links, Parker, Paul, Pearce, Smith, Steffanoff, Steyn, Sullivan), and that therefore EPA cannot claim any benefits from the standards. EPA responds that, as stated in section III.F.2 of the Preamble, no one rule is expected to prevent climate change by itself. As stated in the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule (74 FR at 66543), "The commenters' approach, if used globally, would effectively lead to a tragedy of the commons, whereby no country or source category would be accountable for contributing to the global problem of climate change, and nobody would take action as the problem persists and worsens."[44] While this rule does not single-handedly eliminate climate change, it is an important contribution to reducing the rate of change, and this reduction in rate is global and long-lived. EPA appropriately placed the benefits of reductions in context in the rule, by calculating the likely reductions in temperature and comparing them to total projected changes in temperature over the same time period. In addition, EPA used the social cost of carbon methodology in order to estimate a monetization of the benefits of these reductions (see section III.H.6), and the net present value resulting from the CO_2 reductions due to this rule (between years 2017 and 2050) was calculated to be between tens to hundreds of billions of dollars. The D.C. Circuit pointedly rejected the argument that EPA should refrain from issuing GHG standards under section 202 (a) due to claimed lack of mitigating effect on the endangerment, and further held that "the emission standards would result in meaningful mitigation of greenhouse gas emissions" in the form of "960 million metric tons of CO2e over the lifetime of the model year 2012-2016 vehicles". Coalition for Responsible Regulation v. EPA, No. 09-1322 (June 26, 2012)) slip op. p 43; projected emissions reductions of this MYs 2017-2025 rule are projected to be approximately double those of the MYs 2012-2016 rule.

Some commenters (Haroldson, Pearce, Steyn) additionally claimed that climate change science is "becoming increasingly debunked" and "a scam created through falsified data". However, these commenters provide no support for their assertions except for one quote from an

[44] The Supreme Court likewise spoke to this issue, stating that "[a]gencies, like legislatures, do not generally resolve massive problems" like climate change "in one fell regulatory swoop." Massachusetts v. EPA, 549 U.S. at 524. They "whittle away at them over time." Id. The Supreme Court additionally emphasized that "reducing domestic automobile [greenhouse gas] emissions is hardly a tentative step" toward addressing climate change, inasmuch as "the United States transportation sector emits an enormous quantity of carbon dioxide into the atmosphere." Id. Thus, "[j]udged by any standard, U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations." Id. at 525.

editorial in the Wall Street Journal. These claims are contrary to the conclusions of the major scientific assessments by the National Academies, the US Global Change Research Program, and the Intergovernmental Panel on Climate Change. Responses to similar but more detailed comments may also be found in the Response to Comments and the Response to Petitions for the original Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act (74 FR 66496, December 15, 2009). Finally, see Coalition for Responsible Regulation v. EPA, No. 09-1322 (June 26, 2012) (D.C. Circuit) slip op. p. 30, upholding all of EPA's findings and stating "EPA had before it substantial record evidence that anthropogenic emissions of greenhouse gases 'very likely' caused warming of the climate over the last several decades. EPA further had evidence of current and future effects of this warming on public health and welfare. Relying again upon substantial scientific evidence, EPA determined that anthropogenically induced climate change threatens both public health and public welfare. It found that extreme weather events, changes in air quality, increases in food- and water-borne pathogens, and increases in temperatures are likely to have adverse health effects. The record also supports EPA's conclusion that climate change endangers human welfare by creating risk to food production and agriculture, forestry, energy, infrastructure, ecosystems, and wildlife. Substantial evidence further supported EPA's conclusion that the warming resulting from the greenhouse gas emissions could be expected to create risks to water resources and in general to coastal areas as a result of expected increase in sea level."

16.3. Changes in Global Climate Indicators Associated with the GHG Emissions Reductions

Organizations Included in this Section

Institute for Energy Research (IER)

Organization: Institute for Energy Research (IER)

A. ACCORDING TO EPA, THIS PROPOSED RULE WILL ONLY REDUCE GLOBAL TEMPERATURE 0.0076–0.0184 °C BY 2100—TOO LITTLE TO AFFECT CLIMATE IN A MEANINGFUL WAY OR BE DETECTABLE AGAINST BACKGROUND NATURAL VARIABILITY

This proposed rule to regulate greenhouse gas emissions from light-duty vehicles (as well as EPA's endangerment finding for greenhouse gases under section 202 of the Clean Air Act), and Massachusetts v. EPA are all predicated on the assumption that regulating greenhouse gas emissions from light-duty vehicles will reduce the impacts of climate change in a meaningful way. According to this proposed rule, however, the climatic benefits from reducing greenhouse gas emissions from light-duty vehicles are very, very small. Because the climatic benefits are so small, this rule will not affect climate change in a meaningful way. [EPA-HQ-OAR-2010-0799-9573-A1, p. 2]

1. Climate Concerns in Massachusetts v. EPA—regulating vehicle emissions should result in a “meaningful contribution” to “global warming”

In Massachusetts v. EPA the Supreme Court argued that greenhouse gas emissions were causing a number of harms including, “the global retreat of mountain glaciers, reduction in snow-cover extent, the earlier spring melting of ice on rivers and lakes, [and] the accelerated rate of rise of sea levels during the 20th century relative to the past few thousand years . . . .” [EPA-HQ-OAR-2010-0799-9573-A1, p. 3]

The Court continued to explain global warming harms:

If sea levels continue to rise as predicted, one Massachusetts official believes that a significant fraction of coastal property will be ‘either permanently lost through inundation or temporarily lost through periodic storm surge and flooding events.’ Remediation costs alone, petitioners allege, could run well into the hundreds of millions of dollars. [internal citations omitted] [EPA-HQ-OAR-2010-0799-9573-A1, p. 3]

The failure to regulate greenhouse gas emissions, according to the Court, “contributes” to Massachusetts’ injuries and therefore, EPA could take steps to remedy the injuries caused by climate change. The Court further argued that “reducing domestic automobile emissions is hardly a tentative step” and EPA could regulate greenhouse gas emissions from motor vehicles because, “[j]udged by any standard, U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and hence . . . to global warming.” [emphasis added] [EPA-HQ-OAR-2010-0799-9573-A1, p. 3]

2. Climate Concerns in EPA’s Proposed Endangerment Finding

On December 15, 2009, EPA found that greenhouse gases in the atmosphere “endanger public health and public welfare.” In the endangerment finding, EPA argued that increased levels of greenhouse gases were leading to increased temperatures, decreased Arctic sea ice extent, increased precipitation, an increase in sea level rise, increased forest fires, reduced snowpack, increased droughts, and “endangers the water resources important for public welfare” among other concerns. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 3-4]

3. Climate Concerns in EPA’s Proposed Rule to Regulate GHGs from Light-Duty Vehicles 2017–2025

As EPA explains in the current proposed rule, “light-duty vehicles, heavy-duty trucks, buses, and motorcycles—accounted for 23 percent of all U.S. GHG in 2007.” Because greenhouse gas emissions from light-duty vehicles represent a large portion of U.S. greenhouse gas emissions, EPA argues light-duty vehicles contribute to the effects of climate change: [EPA-HQ-OAR-2010-0799-9573-A1, p. 4]

the health effects of climate change linked to observed and projected elevated concentrations of GHGs include the increased likelihood of more frequent and intense heat waves, increases in ozone concentrations over broad areas of the country, an increase of the severity of extreme weather events such as hurricanes and floods, and increasing severity of coastal storms due to rising sea levels. These effects can all increase mortality and morbidity, especially in vulnerable populations such as children, the elderly, and the poor.

The proposed rule also states there is a “critical need to address global climate change.” [EPA-HQ-OAR-2010-0799-9573-A1, p. 4]

4. Despite these concerns, the proposed rule does not affect climate in a meaningful way, but instead results in, at most, 0.02°C less warming by the year 2100

According to statements from the Supreme Court and EPA on the need to address climate change, this rule would not affect global warming or climate change in any meaningful way. This is because, according to EPA’s modeling, the proposed rule would result in an incredibly small reduction in the increase in global temperature. According to EPA: [EPA-HQ-OAR-2010-0799-9573-A1, p. 4]

The results of the analysis demonstrate that relative to the reference case, projected atmospheric CO_2 concentrations are estimated by 2100 to be reduced by 3.29 to 3.68 part per million by volume (ppmv), global mean temperature is estimated to be reduced by 0.0076 to 0.0184 °C, and sea-level rise is projected to be reduced by approximately 0.074– 0.166 cm, based on a range of climate sensitivities. The analysis also demonstrates that ocean pH will increase by 0.0018 pH units by 2100 relative to the reference case. [EPA-HQ-OAR-2010-0799-9573-A1, p. 5]

A reduction of global temperature by 0.0076–0.018°C 90 years in the future is too small an amount to affect heat waves, air quality, precipitation, intense storms, harm agriculture, wildlife, or ecosystems in any way. A decrease in sea level rise of 0.0074–0.166 cm, 90 years in the future will not reduce the loss of costal property that the Supreme Court was concerned about in Massachusetts v. EPA. [EPA-HQ-OAR-2010-0799-9573-A1, p. 5]

Because EPA’s regulation of greenhouse gases from light-duty vehicles does not impact global warming in a meaningful way, EPA’s regulation is not rational. Either global warming and climate change is a problem that can and should be addressed in a meaningful way through the regulation of greenhouse gas emissions from vehicles or EPA should not be regulating greenhouse gases from vehicles. Instead, EPA claims global warming is a problem but takes no meaningful steps to do anything about it. This is not rational. [EPA-HQ-OAR-2010-0799-9573-A1, p. 5]

EPA’s regulations themselves are very significant. The regulations would double fuel economy standards from 2010 to 2025. But even this will not result in a meaningful reduction in the increase in temperature. Therefore, it does not appear that U.S. greenhouse gas emissions from light-duty vehicles endanger public health and welfare. [EPA-HQ-OAR-2010-0799-9573-A1, p. 5]

In the proposed rule, EPA obfuscates the fact that the rule does not make any meaningful contribution to global warming by stating that the climate impacts are merely “small.” EPA states: [EPA-HQ-OAR-2010-0799-9573-A1, p. 5]

Although the projected reductions and improvements are small in comparison to the total projected climate change, they are quantifiable, directionally consistent, and will contribute to reducing the risks associated with climate change. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 5-6]

EPA's explanation is not sufficient. Just because EPA can quantify something using a computer model or a hand-held calculator, does not mean that it is either detectable or meaningful. [EPA-HQ-OAR-2010-0799-9573-A1, p. 6]

For instance, Hansen et al. 2006 reported that that the precision of their estimate of the annual global temperature anomaly is only known (with 95% confidence) within a range of +/-0.05°C. Thus the error in our measurement of the global temperature is more than twice as great as the highest level of temperature savings calculated by the EPA (which is 0.0184°C). [EPA-HQ-OAR-2010-0799-9573-A1, p. 6]

The error is compounded when calculating a trend over the long-term (like out to the year 2100—or a timescale of about a century). For instance, using a least-squares statistical fit to the temperature annual global temperature anomalies in Hansen's dataset from 1900–2011 shows that the temperatures have risen at a rate of 0.681 +/- 0.074°C per century. So for a century-long trend, the error is more than 4 times as large as the EPA's highest amount of temperature savings. [EPA-HQ-OAR-2010-0799-9573-A1, p. 6]

While EPA's temperature savings is quantifiable, it is not detectable. Since it is not detectable, it means that we cannot assess any sort of scientific meaningfulness from such a change. [EPA-HQ-OAR-2010-0799-9573-A1, p. 6]

This lack of scientific meaningfulness in EPA's regulation is a problem. EPA is supposed to protect the public health and welfare. EPA's regulations should be meaningful, not merely "quantifiable," and "directionally consistent." EPA's statement about quantifiability and directionality would be equally true if greenhouse gas emissions standards were increased by 1 gram per mile (i.e. 249 grams per mile instead of 250). But instead of tightening the standard to 249 grams per mile, EPA sets the standard at 163 grams per mile in 2025. EPA gives no rational basis for choosing 163 grams per mile instead of 249 grams per mile. [EPA-HQ-OAR-2010-0799-9573-A1, p. 6]

For all practical purposes, in the context of human welfare, setting the GHG emission standard at 249 grams per mile would result in the same climate impact as setting the standard at 163 grams per mile. The theoretical temperature impact of a 1 gram per mile standard would be even less than 0.0076–0.018°C, but because 0.0076–0.018°C is so small, the difference would be indistinguishable in the real world. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 6-7]

It should be noted that the EPA Administrator is required to explain the reasonableness of her regulatory response. For example, Motor Vehicle Mfrs.' Ass'n v. State Farm Mut. Auto. Ins. Co., requires the agency to "examine the relevant data and articulate … a 'rational connection between the facts found and the choice made.'" The EPA has not done that in this case—there is no rational connection between EPA finding that greenhouse gases endanger public health and welfare and a rule which does not result in a meaningful impact on the imperiled public health and welfare. [EPA-HQ-OAR-2010-0799-9573-A1, p. 7]

5. The climate impact of the proposed rule, though small, may nevertheless be overstated

It is quite possible that EPA's estimate of the reduction in temperature and sea level rise is an overestimate. EPA used a climate sensitivity of 1.5 to 6°C. More recent science argues that the climate sensitivity is likely to be below or in the low range of this estimate. For example, one recent paper found it likely that that climate sensitivity is between 1.7°C and 2.6°C. Another recent paper found a "Transient Climate Response of 1.3–1.8°C". [EPA-HQ-OAR-2010-0799-9573-A1, p. 7]

Previously, EPA has avoided considering climate sensitivities lower than the AR4 range arguing that the IPCC was correct. In 2010, EPA stated: [EPA-HQ-OAR-2010-0799-9573-A1, p. 7]

"the IPCC indicates the levels of understanding and confidence in quantitative estimates of equilibrium climate sensitivity have increased substantially and there is increased confidence of key processes that are important to climate sensitivity due to improved comparisons of models to one another and to observations. Thus EPA concludes that the use of the climate sensitivity range for the climate analysis for this rule is appropriate and supported by the scientific literature from the major assessment reports." [EPA-HQ-OAR-2010-0799-9573-A1, pp. 7-8]

In this proposed rule, it is good to see EPA consider a climate sensitivity lower than the IPCC's standard climate sensitivity of 2 to 4.5°C. EPA's past response is now inadequate because of more recent science. Furthermore, the more recent science argues for climate sensitivity nearer the low end of the range and discounts the top end of the range EPA used. [EPA-HQ-OAR-2010-0799-9573-A1, p. 8]

The climate sensitivity is important because it forms the basis for EPA's justification for regulating greenhouse gases from light-duty vehicles. If the lower bound for climate sensitivity is correct, the impact of this proposed rule would only be about 0.008°C by 2100—an incredibly small amount to say the least. [EPA-HQ-OAR-2010-0799-9573-A1, p. 8]

6. Because these regulations would not affect climate in a meaningful way, this calls into question EPA's Endangerment Finding

This proposed rule is a follow-up to EPA's proposal that greenhouse gases from motor vehicles "endanger public health or welfare" under section 202 of the Clean Air Act. The 2017-2025 light-duty vehicle standard demonstrates that the Endangerment Finding is on shaky ground. If greenhouse gas emissions from motor vehicles "endanger public health or welfare," it stands to reason that this proposed rule should lead to meaningful climatic benefits. However, because this proposed rule would only lead to a reduction in global temperature by 0.0076–0.0184°C by 2100 that is both climatically meaningless and undetectable against background natural variability, this rule does not create a meaningful impact. [EPA-HQ-OAR-2010-0799-9573-A1, p. 8]

7. Conclusion to Section A

Because this rule fails to affect climate in a meaningful way, and because reducing climate harms is the point of EPA's regulatory authority under Massachusetts v. EPA and the proposed endangerment finding, EPA should not regulate greenhouse gases from light-duty vehicles. [EPA-HQ-OAR-2010-0799-9573-A1, p. 8]

Response:

The Institute for Energy Research (IER) makes two major claims in order to argue against the standard. First, that the estimated reductions in climate change in the rule do "not affect climate in a meaningful way." This argument has been addressed in Section 16.2. As noted there, the commenter's argument has been decisively and pointedly rejected by the D.C. Circuit. It also bears mention that regardless of the degree to which this rule will, in and of itself, ameliorate global climate change, EPA has clear discretion under section 202 (a) to issue these standards following its positive endangerment finding. Section 202 (a) does not specify any minimum level of effectiveness for standards. Rather, section 202 (a) directs EPA to set the standards at a level that is reasonable in light of applicable compliance cost and technology considerations. Like any other technology based standard, the rule's stringency is not dependent on any particular environmental outcome but rather on a weighing of the statutorily specified criteria relating to feasibility, cost and available lead time. The second claim by IER is that the climate impact of the rule has been overstated. IER references two new studies in order to argue that the climate sensitivity of the Earth system to a doubling of carbon dioxide concentrations is at or below the low end of the range used by the EPA (which was 1.5 to 6.0 degrees C). While this new research is of interest, these studies are not definitive. The EPA has reasonably relied on comprehensive assessments like those of the National Academies, US Global Change Research Program, and IPCC because assessments cover the full range of the literature and place the individual studies in context.

The first study cited by IER is Schmittner et al., 2011, which estimates a likely range of climate sensitivity of 1.7 to 2.6 degrees C. This climate sensitivity is on the low end of the IPCC estimates. This study is a useful contribution, but depends on a single computer model as well as on estimates of conditions during the last glacial maximum (such as temperature and forcing) that are difficult to calculate. For example, the authors acknowledge that their estimates of global mean temperatures in the last glacial maximum are 30 to 40 percent smaller than previous estimates, and only 2.2 degrees C cooler than present, and a recent review of paleoclimate studies shows that the Schmittner et al. estimate of global glacial temperatures remains an outlier (Braconnot et al., 2012[45]). Meanwhile, other recent studies estimating climate sensitivity have come to the conclusion that the IPCC range is possibly an underestimate rather than an overestimate (Pagani et al., 2009[46]). Therefore, it would be premature at this time to conclude based on Schmittner et al. that the climate sensitivity range used by the EPA is either an over or an underestimate.

[45] Braconnot P. et al., Evaluation of climate models using palaeoclimatic data, Nature Climate Change (2012), doi:10.1038/nclimate1456. (Docket EPA EPA-HQ-OAR-2010-0799)
[46] Pagani, M., Z. Liu, J. LaRiviere, and A. Ravelo, 2010: High Earth-system climate sensitivity determined from Pliocene carbon dioxide concentrations. *Nature Geoscience*, 3, 27-30. (Docket EPA EPA-HQ-OAR-2010-0799)

The second paper cited by IER estimated the "Transient Climate Response" (TCR), and IER incorrectly compares this TCR estimate to the range of equilibrium climate sensitivity estimates used by the EPA. Transient sensitivity is a measure of the temperature change precisely at the time of doubling of CO_2 concentrations, before the climate system has come to equilibrium, in contrast to the climate sensitivity which is related to the temperature response after the system has come to equilibrium. The IPCC fourth assessment report, in Table 8.2 (Randall et al., 2007[47]), shows how the TCR compares to the climate sensitivity in a number of climate models. The climate sensitivity in this table ranges from 1.3 to 2.3 times the TCR. Applying these ratios to the TCR estimates provided by the commenter results in a range of CS from 1.7 to 4.2, which is similar to the likely range of 2 to 4.5 provided by the IPCC.

Therefore, the EPA finds that the range of climate sensitivity used in this rule is appropriate, and that the analysis of climate impacts was appropriate and reasonable.

[47] Randall, D.A., R.A. Wood, S. Bony, R. Colman, T. Fichefet, J. Fyfe, V. Kattsov, A. Pitman, J. Shukla, J. Srinivasan, R.J. Stouffer, A. Sumi, and K.E. Taylor (2007) *Climate Models and Their Evaluation*. In: *Climate Change2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. (Docket EPA EPA-HQ-OAR-2010-0799)

17. Analysis of Impacts on Non-GHG Emissions

Organizations Included in this Section

American Lung Association of the Mid-Atlantic
Clean Fuels Development Coalition (CDFC)
Growth Energy

Comments on GDI and PM

Organization: Clean Fuels Development Coalition (CDFC)

OEMs NEED CLEANER FUELS IN ORDER TO FULLY AND COST EFFECTIVELY COMPLY WITH THE RULE.

To meet the aggressive targets established by this rule, OEMs will employ advanced engine technologies that would benefit from and require fuel quality improvements in order to meet the fuel efficiency and lower carbon goals without worsening other forms of pollution and contributing to air quality backsliding. The OEMs will bundle multiple advanced engine technologies to meet the stricter targets. Notably, the Agencies project that for spark ignition (SI) engines, gasoline direct injection (GDI) will be an especially important compliance tool, and they expect the OEMs to rapidly adopt it, projecting 85% penetration by 2016, and 100% by 2020 and beyond. However, as will be discussed more below, absent fuel composition changes, experts warn that for all of its mileage efficiency and carbon reduction benefits, GDI technology is expected to result in substantial increases in urban ambient particulate matter, especially the highly pathogenic $PM_{2.5}$ that includes UFPs.5 Unfortunately, if regulators ultimately decide to deal with that problem by requiring the OEMs to install filters and traps on SIDI engines (as is now done with diesel engines), adverse consequences are likely to ensue. Engine efficiencies and costs to consumers will be compromised. The Agencies will limit the ability of the OEMs to utilize engineering expertise to develop the optimal solution to reach the goals of this regulation. Experts warn that gasoline UFPs are so much smaller than diesel PM, use of filters will be ineffective, cost prohibitive, and counterproductive, leading to increased carbon emissions and reduced engine efficiency.6 In short, failure to synchronize fuel composition changes with advanced engine technologies could negate many of the positive outcomes this rule is designed to achieve. [EPA-HQ-OAR-2010-0799-9574-A3, p. 3]

As previously discussed, experts warn that advanced engine designs needed for automakers to comply with tighter fuel efficiency rules could lead to a significant increase in the UFP fraction of $PM_{2.5}$ emissions unless fuel composition is upgraded to replace the toxic octane components of Aromatic Group Compounds with Clean Octane components.24 [Attachment E can be found in Docket number EPA-HQ-OAR-2010-0799-9574-A8] [EPA-HQ-OAR-2010-0799-9574-A3, p. 7]

PAHQs are combustion byproducts and derivatives of Aromatic Group Compounds (see Attachment C for the discussion in the 2010 Honda SAE paper), and could be inadvertently and substantially increased by this rulemaking in the absence of fuel composition changes. [EPA-HQ-OAR-2010-0799-9574-A3, p. 7]

As the 2007 Tufts University study warned, this oversight represents a major deficiency in transportation fuels regulatory policy, especially since vehicle GHG reduction technologies expected to come into widespread use as a result of this rule are likely to increase these pollutants dramatically.29 [EPA-HQ-OAR-2010-0799-9574-A3, p. 8]

VEHICLE FILTERS INEFFECTIVE FOR GASOLINE‘S SMALLER PARTICLES.

A number of recent studies have concluded that requiring the OEMs to fit gasoline-powered vehicles with filters or traps, as they have done with diesel engines, would be cost prohibitive, ineffective, and counterproductive. For example, according to the Delphi Powertrain International 2011 SAE study, ". . . the number size distributions show for homogeneous gasoline engines compared to Diesel engines typically a higher number of particles at smaller sizes…the typically smaller particles generated by gasoline engines require a finer filter characteristic…which consistently leads to a negative impact on performance, fuel consumption, and CO_2 emissions." For that reason, we firmly believe that the most cost effective, and technologically efficient, solution to these undesirable tradeoffs is to upgrade fuel standards to significantly reduce Aromatic Group Compounds, which are the primary source of the $PM_{2.5}$ and particle-bound toxics. [EPA-HQ-OAR-2010-0799-9574-A3, p. 7]

Organization: Governors' Biofuels Coalition

Recent reports indicate that the failure to establish tighter fuel standards to complement advanced engine designs could result in dramatic increases in a major health threat in urban areas: fine and ultrafine particulate matter. [EPA-HQ-OAR-2010-0799-9570-A1, p. 2]

Organization: Growth Energy

This Attachment explains why, in the Joint NPRM, the Agencies should have thoroughly examined the impacts of new technologies used to meet the GHG standards on PM emissions. There are many studies that indicate that gasoline direct injection, a technology which will be used to meet the GHG standards, will increase both particulate matter mass and particulate number emissions. The Agencies need to consider an alternative approach, which would include fuel parameter changes that could enable additional engine technologies to be used to improve efficiency and reduce emissions. The Agencies' proposal requires new technology to be used on vehicles using old technology fuels. It has long been recognized that vehicles and fuels operate as a system. To undertake significant changes and increases in the stringency of tailpipe GHG standards without a parallel and integrated examination of potential changes in the fuel used by these vehicles is inappropriate. [EPA-HQ-OAR-2010-0799-9505-A1, p. 22]

I. Relevant Emissions Impacts

The Joint NPRM includes extensive discussion of the technologies, costs, and benefits of the proposal, seeking comments on many aspects of the proposal. In addition, EPA “seeks comment on whether there are any other health and environmental impacts associated with advancements in vehicle GHG reduction technologies that should be considered.” These are the salient points:

- EPA and NHTSA project widespread use of gasoline direct injection (GDI) in meeting the proposed CAFÉ and GHG standards.
- There is substantial evidence that GDI increases PM mass and PM number emissions compared to the conventional port fuel injection (PFI) technology now in widespread use.
- There is also substantial evidence that increased ethanol use will decrease PM mass and PM number emissions from the affected vehicles.
- The EPA and NHTSA proposal does not account for the increased PM emissions from GDI technology.
- The benefits from the proposal are sensitive to the PM effects assumed by the Agencies.
- Therefore, the final rule should evaluate and consider both the increased PM due to GDI use and the potential for more widespread ethanol use to decrease PM mass and number emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 23]

A. EPA and NHTSA project widespread use of gasoline direct injection (GDI) in meeting the proposed CAFÉ and GHG standards.

The proposed rule discusses technologies that can increase fuel economy, indicating that many of the technologies are already available, and that manufacturers will be able to meet the standards through significant efficiency improvements in these technologies as well as a significant penetration of these technologies across the fleet. [EPA-HQ-OAR-2010-0799-9505-A1, p. 23]

The proposed rule indicates:

There are a number of competing gasoline engine technologies, with one in particular that the agencies project will be common beyond 2016. This is the gasoline direct injection and downsized engines equipped with turbochargers and cooled exhaust gas recirculation, which has performance characteristics similar to that of larger, less efficient engines. [EPA-HQ-OAR-2010-0799-9505-A1, p. 24]

The Joint NPRM also provides estimates of the penetration of various technologies in 2021 and 2025. GDI penetrations are forecast to be greater than 90% in both cars and trucks by 2025 as shown in Tables III-42 and III-43. Therefore, widespread use of GDI is one of the technologies that the Agencies are relying on in the proposal. [EPA-HQ-OAR-2010-0799-9505-A1, p. 24]

34 In the recent California GHG rulemaking, the Air Resources Board avoided this issue by assuming that PM mass emissions from PFI and GDI would be similar based primarily on speculative assumptions about future GDI technology and deterioration rates.

The Joint NPRM considers several impacts of the proposal on non-GHGs, both positive and negative. For example, the analysis evaluates the impact that reductions in domestic fuel refining and distribution due to lower fuel consumption will have on U.S. emissions of various pollutants. In addition, the analysis evaluates the increase in emissions from additional vehicle use associated with the rebound effect from higher fuel economy. As the various positive and negative impacts on non-GHGs and considered, the proposal indicates: [EPA-HQ-OAR-2010-0799-9505-A1, p. 30]

Thus the net effect of stricter CAFE standards on emissions of each pollutant depends on the relative magnitudes of its reduced emissions in fuel refining and distribution, and increases in its emissions from vehicle use. [EPA-HQ-OAR-2010-0799-9505-A1, p. 30]

One aspect of these “complex interactions” that certainly merits attention is the potential effect of technological innovation on criteria and toxic pollutants, in the absence of improved in-use fuel standards. As HEI’s February 2011 study noted, the use of GDI technology increases some current gasolines’ particulate emissions. Without NHTSA having directly addressing that study in the DEIS, the Agencies simply note in the NPRM that “the net effect of stricter standards on emissions of each criteria pollutant depends on the relative magnitudes of reduced emissions from fuel refining and distribution, and increases in emissions resulting from added vehicle use.” 76 Fed. Reg. at 74,933. That cursory observation does not meet the requirements of NEPA for a “thorough investigation” and a “candid acknowledgment” of risks. Nat’l Audubon Soc. v. Dept. Navy, 422 F.3d 174, 185 (4th Cir. 2005; see also Natural Resources Defense Council, Inc. v. Morton, 458 F.2d 827, 838 (D.C. Cir. 1972); Kleppe v. Sierra Club, 427 U.S. 390, 410 fn. 21 (1976); 'Ilio'ulaokalani Coalition v. Rumsfeld, 464 F.3d 1083, 1094 (9th Cir. 2006; accord, Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin., 538 F.3d 1172, 1223 (9th Cir. 2008). [EPA-HQ-OAR-2010-0799-9505-A1, p. 31]

B. There is substantial evidence that GDI increases PM mass and PM number emissions compared to the conventional PFI technology now in widespread use.

A recent Myung and Park review of nano-particle emissions from internal combustion engines indicates that GDI engines produce considerably more particles than conventional port fuel injection ones and that “much of the research indicates that GDI engines produce significantly more particulates than conventional PFI engines, especially during the cold start phase and during stratified operation.” Myong and Park provide numerous references to support their findings, including textbooks, literature surveys, research studies using single-cylinder and multi-cylinder engines in which various parameters can be changed, measurements from production engines, and studies of various potential after-treatment systems. [EPA-HQ-OAR-2010-0799-9505-A1, p. 24]

The California Air Resources Board (CARB) in 2010 acknowledged that GDI increased PM mass and number emissions substantially. The CARB report indicated “GDI technology tends to have higher PM mass and particle number emissions than conventional PFI technology.” The

CARB report noted that the published literature points to GDI PM mass emissions in the range of 2 to 20 mg/mi, and indicated that, if not abated, the GDI combustion system has the potential to emit two to eight times more PM mass than PFI vehicles. [EPA-HQ-OAR-2010-0799-9505-A1, p. 24]

Szybist et al., 2011 also report that "while gasoline DI technology is beneficial for fuel economy, it produces an increase in particulate matter emissions in comparison to PFI engines" and provide several references to support that fact. Maricq also notes the DI PM issue: [EPA-HQ-OAR-2010-0799-9505-A1, pp. 24-25]

GDI engines offer a number of opportunities for improved fuel efficiency, such as reduced pumping losses, charge air cooling, and downsizing when turbocharged. But, direct injection of fuel into the engine cylinder is susceptible to incomplete fuel evaporation and to fuel impingement on piston and cylinder walls, both of which lead to combustion of liquid fuel and, consequently, to increased PM emissions. [EPA-HQ-OAR-2010-0799-9505-A1, p. 25]

A recent report by the Health Effects Institute's Special Committee on Emerging Technologies states that the need to improve fuel economy and the need to reduce GHG emissions are driving the introduction of gasoline direct injection (GDI) technology because it improves fuel economy and performance. They state GDI is more expensive than the port fuel injection (PFI) system that it is replacing. They also point out that because of less complete mixing of the fuel vapor and air in GDI systems, particulate emissions of the engine increase, including the number of ultrafine particles (UFPs defined as particles that are less than 100 nanometers (nm) in diameter). Thus additional technological fixes may be required to meet the Tier 2 $PM_{2.5}$ emission standards for GDI vehicles which would incur additional costs. More recently, similar concerns were echoed by Ayala, Brauer, Mauderly and Samet. [EPA-HQ-OAR-2010-0799-9505-A1, p. 25]

With respect to current production vehicles, Piock et al., 2011 present results for particle number and particle mass for a number of production European vehicles that meet the Euro 4 (2005) standards in their Figure 1. The seven GDI vehicles have an order of magnitude higher PM mass and PM number emissions than do the three PFI vehicles. [EPA-HQ-OAR-2010-0799-9505-A1, p. 25]

Because a limit on PM number emissions is under discussion for implementation in 2014 in Europe, effort toward understanding and reducing PM mass and PM number emissions from GDI engines is underway. There are two basic approaches on the emitted by the engine, and (2) aftertreatment particulate filters. It is not clear how successful either of these approaches can be. With manufacturers under strong incentives to optimize engines for fuel economy and cost, optimization for minimum PM mass and number emissions may conflict with optimization for fuel economy or may add additional cost for hardware and development. With regard to particulate filters, Piock et al. indicate: [EPA-HQ-OAR-2010-0799-9505-A1, pp. 25-26]

In principle, particulate filters already in standard use on modern Diesel engine powered passenger cars can be applied to gasoline engines as well. The typically smaller particles generated by gasoline engines require a finer filter characteristics (e.g. cell density, mean pore size and porosity) which consequently leads to a higher exhaust system backpressure with a negative impact on performance, fuel consumption and CO_2 emissions. The addition of a particulate filter system would cause a significant increase of the overall aftertreatment system complexity and cost. [EPA-HQ-OAR-2010-0799-9505-A1, p. 26]

The proposed rule is silent on the potential increase in PM mass and number emissions due to the widespread use of GDI. As noted above, this is a major oversight. EPA and NHTSA have an obligation to insure that any new fuel or technology developed for transportation must not adversely impact health or the environment. [EPA-HQ-OAR-2010-0799-9505-A1, p. 26]

Despite the evidence that widespread use of GDI may increase PM emissions, the proposal does not address the issue. The proposal does note that:

EPA has the discretion under the CAA to consider many related factors, such as the availability of technologies, the appropriate lead time for introduction of technology, and based on this the feasibility and practicability of their standards; the impacts of their standards on emissions reductions (of both GHGs and non- GHGs); [EPA-HQ-OAR-2010-0799-9505-A1, p. 30]

Therefore, even if EPA determines that it cannot implement Growth Energy's proposal at the current time, given the limits on the current rulemaking, the Final Rule should evaluate and consider both the increased PM due to GDI use and the potential for more widespread ethanol use to decrease PM emissions. In considering the increased PM due to widespread use of GDI technology, the final rule should consider the increase in PM mass as well as particle number.34 The emission of, effects from, and potential mitigation of ultrafine particles from vehicles are all active research areas. In addition, various approaches for setting particle number standards for vehicles are being considered in Europe and California. Within the time frame of the regulations in the proposed rule, the importance of ultrafine particles and their control will be understood. [EPA-HQ-OAR-2010-0799-9505-A1, p. 40]

The final rule should also consider potential ways of mitigating the PM increases from GDI use. The mitigation methods examined should include both fuel-related methods and aftertreatment. Higher ethanol use should be thoroughly evaluated. [EPA-HQ-OAR-2010-0799-9505-A1, p. 40]

However, there is no discussion in the in the proposal indicating that EPA considered whether the technologies assumed in the proposal would increase non-GHG emissions. This is an important oversight. Instead, EPA merely assumed that they would not. For example, the proposal indicates: [EPA-HQ-OAR-2010-0799-9505-A1, p. 30]

The agencies' analysis assumes that the per-mile emission rates for cars and light trucks produced during the model years affected by the proposed rule will remain constant at the levels resulting from EPA's Tier 2 light duty vehicle emissions standards. [EPA-HQ-OAR-2010-0799-9505-A1, p. 30]

Organization: Boyden Gray & Associates PLLC

As air toxics, PAHs must be removed under the MSAT provisions, because there are ample substitutes. It is especially important to do this before efficiency technologies such as direct injection are adopted. Such technologies will increase PAH emissions, compounding the problem and necessitating expensive future tailpipe adjustment for pollution that is the fault of the fuel, not the car, and that could be addressed at no cost today. [EPA-HQ-OAR-2010-0799-9506-A1, pp. 8-9]

Organization: Marz, Loren C.

GDI technology (especially lean-burn GDI) may have difficulty meeting future PM emission limits as currently proposed by the California Air Resources Board (CARB) based on several studies (e.g., 'Preliminary Discussion Paper – Proposed Amendments To California's Low-Emission Vehicle Regulations – Particulate Matter Mass, Ultrafine Solid Particle Number, And Black Carbon Emissions.' CARB, http://www.arb.ca.gov/msprog/levprog/leviii/meetings/051810/pm_disc_paper-v6.pdf; Walter Piock et al, "Strategies Towards Meeting Future Particulate Matter Emission Requirements in Homogeneous Gasoline Direct Injection Engines." SAE International, 2011-01-1212, http://delphi.com/pdf/techpapers/2011-01-1212.pdf; Kody Klindt, IAV Automotive Engineering Inc., 'Reducing the particulate emission numbers in DI Gasoline Engines.' http://www1.eere.energy.gov/vehiclesandfuels/pdfs/deer_2010/monday/presentations/deer10_klindt.pdf). This has the potential of effectively requiring particulate filters (GPF) on GDI vehicles, which in turn has the potential of significantly increasing the price of GDI technology and/or reducing the assumed efficiency of GDI technology. [NHTSA-2010-0131-0213-A1, pp.4-5]

<u>Response to GDI-PM Comments:</u>

As discussed in Preamble section III. G.1 and RIA Chapter 6.2, EPA is finalizing greenhouse gas emissions standards that will result in a net reduction of $PM_{2.5}$. In 2030, the EPA estimates that the MY 2017-2025 light-duty standards will reduce total $PM_{2.5}$ inventories by 1,254 short tons. The EPA analyzed the impact the MY 2017-2025 light-duty vehicle GHG rule will have on $PM_{2.5}$ and other non-GHG pollutants in both 2020 and 2030. For $PM_{2.5}$ the EPA estimates reductions in "upstream" $PM_{2.5}$ emissions, including reductions from fuel refining, distribution and transport as a result of the standards, We also estimated "downstream" increase in $PM_{2.5}$ due to people driving more. The rule effectively makes the cost per mile of driving lower for consumers by improving fuel economy, increasing the likelihood that they will drive more. This is known as the "rebound effect." Thus this small downstream $PM_{2.5}$ increase is a result of a predicted change in driving behavior consistent with the economics literature, as well as the past four Corporate Average Fuel Economy (CAFE) rulemakings. In addition, we also estimate a small increase in $PM_{2.5}$ from power plants as electric powertrain vehicles increase in prevalence as a result of this rule.

With regard to advanced engine technologies, such as "gasoline direct injection fuel systems" or GDI, there are various forms of this technology in production today. While some initial designs are not yet optimized for PM emissions performance, the EPA believes that industry will have adopted the cleanest forms of GDI by the timeframe of this rule.

We received several comments on $PM_{2.5}$ emissions from advanced technology vehicles. Growth Energy commented that "There is substantial evidence that GDI increases PM mass and PM number emissions compared to the conventional port fuel injection (PFI) technology now in widespread use… Therefore, the final rule should evaluate and consider both the increased PM due to GDI use and the potential for more widespread ethanol use to decrease PM mass and number emissions." The Clean Fuels Development Coalition and Loren Marz submitted similar comments. EPA agrees with the commenter that testing on initial GDI technology, primarily wall-guided systems, has shown an increase in PM emissions over the FTP as compared to conventional PFI gasoline engines. However as noted above, the technology is still evolving, making it difficult to predict future PM emission performance of GDI vehicles. Testing on initial spray-guided GDI systems has shown less of a PM increase over the FTP, and even reduced PM emissions over the US06 compared to PFI vehicles.[48] Due to the improved fuel economy and reduced emissions offered by spray-guided GDI technology, it is anticipated that spray-guided GDI will replace wall-guided systems in the 2017 to 2025 timeframe.[49] As a result, in the technical assessment conducted by the agencies as part of this rulemaking, the agencies assessed the emissions and fuel consumption improvements associated with spray-guided GDI systems and assumed that their overall in-use PM emission performance was comparable to that of PFI vehicles.

Regarding comments from Clean Fuels Development Council (CFDC) on use of Aromatics as ethanol use in gasoline has continued to rise in response to market forces and RFS, the additional octane provided by ethanol has been used by refiners to reduce the concentration of aromatics (another source of octane) in the gasoline they supply. As shown below in figure below, there has been a 15 percent decrease in aromatics with the rise in ethanol use over the past decade. Some recent research[50] suggests that this aromatics reduction has lead to reductions in both PM emissions and improvement in PM air quality. Instead of allowing aromatics levels to fall naturally as ethanol levels increase, an aromatics standard could ensure that gasoline aromatic levels fell in proportion to the projected increase in ethanol use. With the increased use of ethanol, not only have the aromatic levels in gasoline been declining, but we project that they will continue to decline. The average level of aromatics in gasoline today is around 22 percent, although it ranges from 3 to 47 percent on a batch basis, and 10 to 40 percent on a refinery average basis due to the wide variation in refinery configuration, crude oil source, and available product markets.[51] Some stakeholders have stated that EPA should mandate even larger reductions in the aromatics content of gasoline in order to provide an incentive for increased ethanol use in gasoline beyond RFS levels. They believe that the country would benefit from reduced air pollution (air toxics, PM emissions and secondarily-formed PM) resulting from the reduction in the aromatic content of gasoline. Such regulatory action is clearly outside the scope of this light-duty GHG standards rulemaking. However, given the potential PM emission benefits, it is something that may warrant further study in the future.

[48] "Test Program to evaluate PM emissions from GDI vehicles," Memo from Michael Olechiw to EPA docket EPA-HQ-OAR-2010-0799

[49] The technology modeling for this rule includes a spray guided GDI system. See Joint TSD Section 3.3

[50] "Development of a Predictive Model for Gasoline Vehicle Particulate Matter Emissions," by K. Aikawa, T. Sakurai, J. Jetter. SAE International 2010-01-2115. Published 10/25/2010. SAE International Journal of Fuels and Lubricants, Volume 3, Issue 2. "Particle Emissions from a 2009 Gasoline Direct Injection Engine Using Different Commercially Available Fuels," by I. Khalek, T. Bougher, J. Jetter. SAE International 2010-01-2117. Published 10/25/2010. SAE International Journal of Fuels and Lubricants, Volume 3, Issue 2.

[51] Based on current refinery batch data.

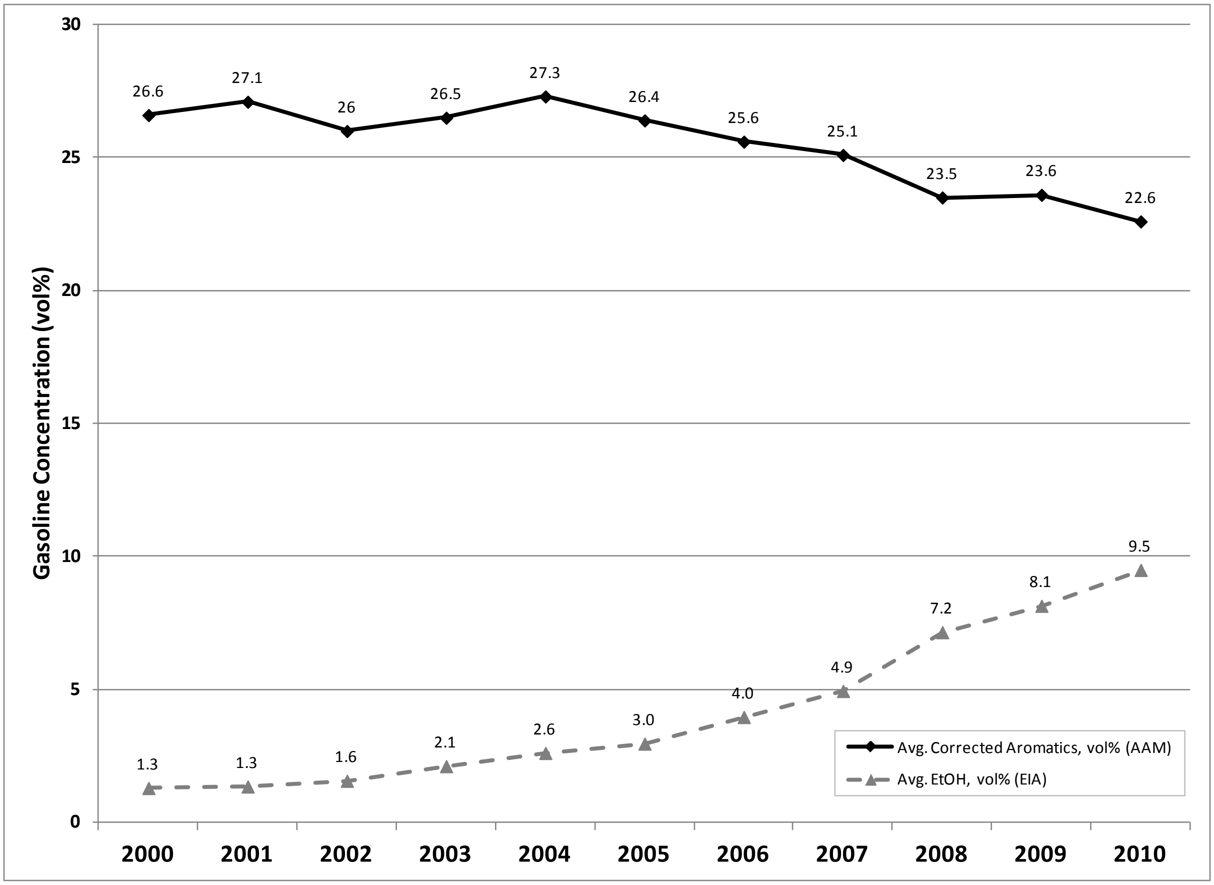

Figure: Aromatics and Gasoline Ethanol Concentration vs. Time

Increases in Pollutants due to the Final Standards

Organization: American Lung Association of the Mid-Atlantic

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 81-82.]

Although reducing traditional air pollution emissions is not the primary focus of the proposed rules, in some scenarios result in increases for particular vehicle pollutants, notably carbon monoxide and aldehydes.

ALA nevertheless recognizes that the general trend across the alternatives considered is to lower emissions of ambient air pollutants when compared with the no action alternative.

Not only does the preferred alternative, the proposed standards, result in significantly lower carbon dioxide emissions.

But these standards also result in lower levels of sulfur dioxide, fine particle pollution, volatile organic compounds, nitrogen oxides, benzene and diesel particulate matter once fleet turnover would be substantially complete by 2040 with the reduction in VOCs and NO_x yielding corresponding increases in ground level ozone.

Organization: Boyden Gray & Associates PLLC

Again, at the very least, EPA must address this issue: if it is going to rely on the CAA for authority to reduce mobile CO_2, it cannot ignore the same statute's requirements to reduce mobile source air toxics, especially if that reduction also reduces CO_2. At the very least, EPA cannot under the CAA cause an increase of one form of regulated pollution that causes serious health problems by reducing another that does not. [EPA-HQ-OAR-2010-0799-9506-A1, p. 10]

There are other factors at work in addition to the rebound effect. The California Air Resources Board's (CARB) pending proposal for lowering PM standards charts the increase in PM that is expected to result from new technologies such as GDI. CARB's proposed tightened PM limits are thus designed to counteract this "backsliding"—an increase in addition to that caused by the rebound effect. But fuel reformation with alcohol blending or CNG could produce reductions and block this "backsliding" at far less cost than tailpipe regulations. At the very least, this issue must be addressed in this proceeding, which will otherwise cause pollution increases that are likely to be held illegal under the CAA and which might never be precluded by any Tier III rule. [EPA-HQ-OAR-2010-0799-9506-A1, p. 10]

Response:

As we state in Section 11 of this Response to Comments document, reducing the aromatic content of gasoline is clearly outside the scope of this LD GHG standards rulemaking. However given the potential PM emission benefits, the Agency is continuing to study the effects of aromatics on vehicle emissions and air quality. The innuendo that this rule will significantly increase emissions of air toxics as a trade-off for controlling GHGs is misplaced. EPA performed national-scale air quality modeling to estimate future year annual $PM_{2.5}$ concentrations, 24-hour $PM_{2.5}$ concentrations, 8-hour ozone concentrations, air toxics concentrations, visibility levels and nitrogen and sulfur deposition levels based on the final vehicle standards and, as detailed in Section 6.2.2 of the RIA, our modeling indicates that there will be only small changes in ambient concentrations of criteria and air toxics pollutants as a result of this rule. The overall small impacts of the final vehicle standards are a function of emissions changes related to VMT increases from rebound, upstream reductions in petroleum consumption from crude oil production and transport, and gasoline production, distribution and transport, and changes in location and amount of electricity generation.

Comments on Regional Modeling

Organization: Clean Fuels Development Coalition (CDFC)

5. Update the CMAQ model to ensure full capture of the benefits derived from the significant reductions in urban $PM_{2.5}$ secondary organic aerosol (SOA) that will occur due to the reductions in gasoline "Aromatic Group Compounds" made possible by E30+ blends' substitution (especially significant for OMB cost – benefit analysis purposes, see discussion on p. 6 and Attachment D). [This attachment can be found in Docket number EPA-HQ-OAR-2010-0799-9574-A7] [EPA-HQ-OAR-2010-0799-9574-A3, p. 1]

As will be discussed in more detail below, the Agencies have stated their intention to incorporate more detailed findings in the final rule from new science and model improvements. For example, the EPA says it will use its updated CMAQv.5.0 model to ―…analyze the impact of the standards on PM2.5, ozone, and selected air toxics.‖ This is potentially significant because EPA has known for years that its CMAQ model was substantially under-reporting the formation of mobile source PM2.5 secondary organic aerosols (SOAs). In urban areas, PM2.5 SOAs primarily originate from mobile sources, most importantly from toluene within the Aromatic Group Compounds. It must be assumed that incorporation of these new findings will also require NHTSA to make adjustments to its draft EIS, which gives insufficient attention to mobile source PM2.5, particularly the future health and welfare costs which will be imposed by increases in gasoline-derived particulate matter emissions, and will most severely impact the nation's highly vulnerable urban population. New science suggests that the particulate bound toxics can be found at elevated levels up to 2,500 meters from congested roadways, thus exposing a vast majority of Americans to these deadly pollutants.

- We also note that the EPA's October 19, 2011, announcement of the completion of its CMAQ 5.0 model means that it will be better able to measure localized pollution impacts, such as those that occur near congested roadways.18 As a 2007 Tufts University study19 and others have warned, EPA's regional modeling approach has seriously masked the true health costs of gasoline Aromatic Group Compounds and their primary role in urban PM emissions.

P. 75109, EXPOSURE AND HEALTH EFFECTS ASSOCIATED WITH TRAFFIC-RELATED AIR POLLUTION. We strongly urge the Agencies to update their database and assumptions with regard to how far mobile source air pollutants can travel at elevated levels. The Agencies, both EPA in the rulemaking, and NHTSA in its EIS, assume populations are exposed only 300 – 500 meters from congested roadways. (Even at this limited range, the Agencies note that 48 million people would be subjected to these elevated pollutant levels.) However, more recent studies (such as 2009 CARB, UCLA, and University of Southern California research) show that mobile source-generated PAHs can be found at elevated levels as far away as 2,500 meters, or more than 1.5 miles. The report states that these findings have "significant exposure implications, since most people are in their homes during the hours before sunrise, and outdoor pollutants penetrate into indoor environments."28 This means that the vast majority of Americans are exposed to pathogenic PAHs and other particle-bound toxics that this rulemaking does not consider. As the 2007 Tufts University study warned, this oversight represents a major deficiency in transportation fuels regulatory policy, especially since vehicle GHG reduction technologies expected to come into widespread use as a result of this rule are likely to increase these pollutants dramatically.29 [EPA-HQ-OAR-2010-0799-9574-A3, p. 8]

Response:

EPA performed national-scale air quality modeling using CMAQ v4.7.1 for the final rule. The air quality modeling for these final standards was initiated prior to February 2012, when CMAQ 5.0 was publically released. CMAQ 4.7.1 was used since it was the most current version of the model available at the time the air quality modeling started. CMAQ v4.7.1 includes updates related to secondary organic aerosol (SOA) chemistry. SOA chemistry research, described in Section 6.2.1.2.2 of the RIA, has led to implementation of new pathways for SOA in CMAQ 4.7, based on recommendations of Edney et al. and the recent work of Carlton et al.[52, 53] In previous versions of CMAQ, all SOA was semivolatile and resulted from the oxidation of compounds emitted entirely in the gas-phase. In CMAQ v4.7, parameters in existing pathways were revised and new formation mechanisms were added. Some of the new pathways, such as low-NO_X oxidation of aromatics and particle-phase oligomerization, result in nonvolatile SOA.

Section 6.1.1.10 of the RIA presents information on exposure and health effects associated with traffic-related air pollution near roads. This information is focused within 500 meters of a road because that range includes the distance that review articles show as the range where most studies indicate that pollutants reach background levels. There is research, such as the 2009 study cited by the commenter, indicating that depending on meteorological conditions, near road pollutants can be transported further than 500 meters.

The CMAQ model, described in Section 6.2.1 of the RIA, does not make any assumptions about exposure at various distances from roads. Instead it models the transport and dispersion of pollutants based on numerous science modules that simulate the emission, production, decay, deposition and transport of organic and inorganic gas-phase and particle-phase pollutants in the atmosphere. In addition, as noted above, there are various forms of advanced engine technologies such as GDI, and EPA believes that over the timeframe addressed by this rule, manufacturers will have adopted the cleanest forms of GDI which are expected to have emission performance comparable to PFI vehicles.

Comments on Health Effects of Acetaldehyde

Organization: Clean Fuels Development Coalition (CDFC)

P. 75107, ACETALDEHYDE. We note that EPA states it is currently “conducting a reassessment of cancer risk from inhalation exposure to acetaldehyde,” which is the only hazardous air pollutant associated with increased use of E30+ blends. Attachment F provides preliminary details on acetaldehyde‘s extremely low ranking in terms of Inhalation Risk Factor (IRF), as reported by DOE, CARB, and other experts (1, 3 butadiene = 100; formaldehyde = 4.6; benzene = 3.0; acetaldehyde = 0.8). We will be submitting a more detailed analysis on this subject for the Tier 3 rulemaking, but, in the meantime, we respectfully request that the Agencies take this information into account as they finalize this rule. [Attachment F can be found in Docket number EPA-HQ-OAR-2010-0799-9574-A10] [EPA-HQ-OAR-2010-0799-9574-A3, p. 8]

---

[52] Edney, E. O., T. E. Kleindienst, M. Lewandowski, and J. H. Offenberg, 2007. Updated SOA chemical mechanism for the Community Multi-Scale Air Quality model, EPA 600/X-07/025, U.S. EPA, Research Triangle Park, NC. Docket EPA-HQ-OAR-2011-0135.

[53] Carlton, A.G., B. J. Turpin, K. Altieri, S. Seitzinger, R. Mathur, S. Roselle, R. J. Weber, (2008), CMAQ model performance enhanced when in-cloud SOA is included: comparisons of OC predictions with measurements, Environ. Sci. Technol. 42 (23), 8798–8802. Docket EPA-HQ-OAR-2011-0135.

Response:

EPA is currently conducting a reassessment of cancer risk from inhalation exposure to acetaldehyde. However, inhalation unit risk factors were not used in any of the analyses for this rule.

18. Analysis of Estimated Costs, Economic and Other Impacts

Organizations Included in this Section

Center for Biological Diversity
Growth Energy
Institute for Energy Research (IER)
Investor Network on Climate Risk (INCR) – Ceres
Mass Comment Campaign (20) (Union of Concerned Scientists-1)
National Association of Clean Air Agencies (NACAA)
New Jersey Senate, Third Legislative District
New York City Council, 35th District
New York State Assembly Committee on Government Operations
New York State Senate, 26th District
Pennsylvania Department of Environmental Protection
Shick, R.
Smith, Frank Houston
State of New York, The Assembly

Organization: Center for Biological Diversity

The Agencies cite the fact that the rulemaking's benefits far outweigh their costs as an indication of its reasonableness. But the opposite is true. In light of the statutory mandate to achieve energy conservation, it is unreasonable to design a rulemaking that so obviously undervalues benefits. Here, technologies that can improve fuel efficiency significantly have been ruled out because of alleged cost concerns by manufacturers. Yet, the rulemaking's benefits exceed its costs by many hundreds of billions of dollars.39 The fuel savings alone pay for the costs of additional technologies many times over, leaving billions of dollars in consumer pockets. The Agencies have thus left substantial, achievable fuel economy improvements and public benefits unrealized due to industry objections. Plainly, a rulemaking that elevates the protection of industry profits over energy conservation is contrary to EPCA and EISA. This calculus underlying the preferred alternative is anything but reasonable. [EPA-HQ-OAR-2010-0799-9479-A1, p. 8]

Response:

EPA agrees with the commenter's assessment that the projected benefits of the final standards far exceed the projected costs. Given the entire impact analysis set forth in the preamble and the RIA, EPA concludes that the final standards are reasonable and feasible. However, the commenter's claim that even more stringent standards would be reasonable (because benefits so far exceed projected costs) does not take into account that the benefits of the rule are dependent on vehicles actually being built and purchased when one takes into consideration issues of cost, consumer acceptance, and available lead time. Note that EPA also responds to comments regarding the stringency of the standards in Section 2.

EPA has analyzed these issues in detail, including a projection of technology penetration rates needed to meet more stringent car and truck standards. As set out in detail in Section III.D.6 of the preamble to the final rule, truck and car standards which are 20 grams/mile more stringent would result in significantly increased penetration rates for advanced technologies. This is true in both MY 2021 and even more so in MY 2025. See Tables III-35 and III-37 for trucks, Tables III-42 and III-44 for cars. In addition, as discussed in that section of the preamble, a 20 g mile more stringent truck standard in MY 2021 would raise issues of available lead time and consumer acceptance for introducing challenging technologies into large pickup trucks. -This rapid influx of technologies (and costs) is also illustrated in figures III-3 and III-4. The tables and figures show that more stringent standards add costs and technologies in a non-linear fashion, as costs greatly increase as the rate of electrification increases. This commenter advocated alternative 4 (cars -20g/mi) as its preferred alternative, which is equivalent to an average of 6.5% annual rate of increase in stringency for cars.

This level of stringency increase leads not only to increased costs, but raises issues of consumer acceptance due not only to the cost increases but in response to a marked increase in technology in vehicles. These technology increases include a doubling of electric vehicles and hybrid electric vehicles. For the MY 2025 standards, our analysis indicates that some manufacturers would be required to use the maximum amount of advanced technology we consider feasible (i.e. the phase-in cap amount) to achieve the 20 grams per mile more stringent standard and in some cases add even further advanced technology (see Table III-54 for the alternative 4 example). A number of commenters have noted that current penetration rates of HEVs are low (see discussion in Response to Comments section 18.1). Preamble III.H.1.b discusses issues related to consumer acceptance of EVs. As discussed there, we consider the projected level of EVs and PHEVs in this rule to be small enough that the market is likely to absorb the vehicles, but we acknowledge that we do not have sufficient information to estimate consumer response to these unconventional technologies. Increasing stringency of the standards would of course raise even more questions about market acceptance. In addition, more aggressive standards would raise significant issues not only of cost and consumer acceptance, but available lead time as well.

Additionally, EPA feels that there are substantial uncertainties about the ability of consumers and automakers to absorb the total cost of a program where the total lifetime benefits equal the costs of the program. Although the commenter does not explicitly espouse such stringent standards, the commenter states that “fuel savings alone pay for the costs of additional technologies many times over, leaving billions of dollars in consumer pockets.” Simultaneously the commenter must acknowledge the market limitations associated with such radically high costs as in the alternative where total costs equals total benefits (which would be significantly more stringent than the standards in this rule). Some, if not all, of the increasing costs associated with this rule will be passed along to consumers (see discussions of cost pass-through in Preamble Section III.H.11.a and Response to Comments Section 18.7.1); thus, it is incorrect to imply that “industry profits” are the primary beneficiary of the standards in this rule relative to more stringent standards. Various public commenters (see discussion in Response to Comments Section 18.1) already raise concerns about public acceptance of the increased costs and new technologies resulting from this rule; other commenters express more optimism. As discussed in Response to Comments Section 18.1, consumer acceptance of the vehicles subject to these standards is necessary for the standards to have the impacts predicted in this rule. We believe that the standards in this rule achieve a reasonable balance in promoting technological innovation while maintaining consumer acceptance. Tighter standards would involve significant uncertainties about these factors.

We note that analyses substantially similar to these were presented in the proposed rule, and the commenter does not raise any questions as to the accuracy of these analyses. EPA has made a reasonable policy choice to encourage more rapid penetration of advanced technology, especially into the heavy truck sector, by means of incentives and credit mechanisms, rather than by adopting aggressive standards under which the projected benefits may not accrue in whole or in part for the reasons just given.

Organization: Institute for Energy Research (IER)

Depending on the discount rate used, and the value attributed to the social benefits from reduced greenhouse gas emissions, EPA estimates that through the year 2050, the proposed rule will have net benefits (i.e. benefits exceeding costs) ranging from $460 billion to $1.7 trillion (in 2009 dollars). [EPA-HQ-OAR-2010-0799-9573-A1, p. 9]

However, EPA's cost-benefit analysis rests upon several dubious assumptions, at times straining to account for various possible benefits from the new rule while ignoring quite plausible drawbacks. Even a cursory inspection of EPA's own breakdown of the numbers should give EPA pause before implementing the rule. Because of the sensitivity of the results to the controversial assumptions, it is not merely that EPA may be overstating the net benefits of the rule. Rather, the new rule may impose large net costs. [EPA-HQ-OAR-2010-0799-9573-A1, p. 9]

Furthermore, EPA's cost-benefit analysis for this rule is fatally flawed. [EPA-HQ-OAR-2010-0799-9573-A1, p. 23]

Response:

EPA disagrees with the commenter's assertion that the cost-benefit analysis is fatally flawed. EPA uses standard economic parameters (including discount rates) to measure the monetary value of the rule's impacts. These parameters, methods and assumptions are based on the best available data at the time and are documented extensively in the Preamble, RIA, and Joint TSD that accompanies this rule.

EPA acknowledges that a wide range of estimates is available for many of the primary inputs that are used in the GHG emissions models. EPA recognizes that each of these values has some degree of uncertainty, which we discuss in the Joint TSD. EPA tested the sensitivity of their estimates of costs and benefits to a range of assumptions about each of these inputs, and found that the magnitude of these variations would not have changed the final standards. EPA conducted sensitivity analyses on discount rates (throughout the rulemaking package, but see specifically preamble III.H.10 and RIA Chapter 7.3), the social cost of carbon (preamble III.H.6 and RIA Chapter 7.2), the rebound effect (RIA Chapter 4.5.1), and battery costs, mass reduction costs, the indirect cost markup factor and on the cost learning curves used in this analysis (RIA Chapter 3.11).

In total, EPA's analysis found that the benefits of the final rulemaking, including fuel savings and many other benefit categories such as the Social Cost of Carbon, far outweigh the costs of the standards. See, for example, preamble Table I-17; preamble section III.H.10.

Organization: Investor Network on Climate Risk (INCR) - Ceres

Finally, strong standards will serve to mitigate the economic risks associated with our continuing dependence on oil as well as climate change. In light of the inevitable rise in oil prices given increased demand from China, India and Brazil, we need strong standards in order to reduce transportation costs for businesses and consumers. In addition, climate change presents significant long-term risks to the global economy, and to investors across all asset classes. Strong standards will serve to mitigate that risk by providing significant GHG reductions; the proposed standards would save approximately two billion metric tons of GHG emissions. [EPA-HQ-OAR-2010-0799-9516-A1, p. 2]

Response:

We agree that world oil demand could be relatively strong over the time frame of this rule and that lower demand for petroleum as a result of this rule could help to lower fuel costs in the U.S. transportation sector. We also agree that climate presents significant long-term risks to the global economy and that our climate impacts analysis and valuation show notable benefits associated with GHG reductions. We refer the commenter to the climate impacts and SCC sections in Preamble Section III.H.6, Section III.F.2, RIA Chapter 7, and the Joint TSD Chapter 4 for more details about the benefits.

Organization: Mass Comment Campaign (20) (Union of Concerned Scientists-1)

The proposed standards can bring significant economic, environmental, and energy security benefits. [EPA-HQ-OAR-2010-0799-1558-A1_MASS, p.1]

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 37-38.]

The estimated benefits of this proposal include a reduction in oil consumption of four billion barrels, a reduction in greenhouse gas emissions of two billion million metric tons, fuel savings on the order of $347 to $444 billion and a monetized net benefit to society in the range of $311 to $421 billion.

Organization: New Jersey Senate, Third Legislative District

The projected annual benefits of such standards by 2030 are enormous:

• $45 billion in savings at the gas pump

• 23 billion gallons of gasoline saved

• 280 million metric tons of global warming pollution avoided [EPA-HQ-OAR-2010-0799-9970-A1, p. 1]

Organization: New York City Council, 35th District

On behalf of my constituents urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rulemaking process.

The projected annual benefits of such standards are enormous. By 2030 the standards would:

• Save Americans $45 billion at the gas pump

• Cut annual oil use by an amount equivalent to our imports from Saudi Arabia and Iraq in 2010

• Reduce annual global warming pollution by the amount equivalent to shutting down 70 coal-fired power plants for one year [EPA-HQ-OAR-2010-0799-9901-A2, p. 1]

Organization: New York State Assembly Committee on Government Operations

On behalf of my constituents urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rulemaking process.

The projected annual benefits of such standards are enormous. By 2030 the standards would:

- Save Americans $45 billion at the gas pump
- Cut annual oil use by an amount equivalent to our imports from Saudi Arabia and Iraq in 2010
- Reduce annual global warming pollution by the amount equivalent to shutting down 70 coal-fired power plants for one year [EPA-HQ-OAR-2010-0799-9453-A2, p. 1]

Organization: New York State Senate, 26th District

On behalf of my constituents I urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rulemaking process.

The projected annual benefits of such standards are enormous. By 2030 the standards would:

• Save Americans $45 billion at the gas pump

• Cut annual oil use by an amount equivalent to our imports from Saudi Arabia and Iraq in 2010

• Reduce annual global warming pollution by the amount equivalent to shutting down 70 coal-fired power plants for one year [EPA-HQ-OAR-2010-0799-9884-A1, p. 1]

Organization: State of New York The Assembly

On behalf of my constituents urge you to maximize the consumer and environmental benefits of these standards by keeping the standards as strong as possible through the rulemaking process.

The projected annual benefits of such standards are enormous. By 2030 the standards would:

• Save Americans $45 billion at the gas pump

• Cut annual oil use by an amount equivalent to our imports from Saudi Arabia and Iraq in 2010

• Reduce annual global warming pollution by the amount equivalent to shutting down 70 coal-fired power plants for one year [EPA-HQ-OAR-2010-0799-10155-A1, p. 1]

Organization: The Catskill Center for Conservation and Development

The projected annual benefits of such standards by 2030 are enormous:

• $45 billion in savings at the gas pump

• 23 billion gallons of gasoline saved

• 280 million metric tons of global warming pollution avoided [EPA-HQ-OAR-2010-0799-9913-A1, p. 1]

Organization: Weiner, L.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 105.]

The scale of benefits far outweighs any opposition: Reducing reliance on foreign oil, saving American families thousands of dollars in gas, cutting pollution, creating jobs and revitalizing the American auto industry as an engine of economic growth and innovation, as you heard.

Organization: Center for Biological Diversity

39 The Agencies state the net benefits of the rulemaking as between $311 billion and $421 billion, at 7 and 3% discount rates, respectively, over the lifetimes of the vehicles sold during MY 2017-2025. NPRM, 76 Fed. Reg. 74859 [EPA-HQ-OAR-2010-0799-9479-A1, p. 8]

Response:

EPA thanks the commenters for pointing out the clear benefits associated with the final standards and agrees that the benefits of the standards far outweigh the costs.

Organization: Shick, R.

If enacted, these new regulations will increase average vehicle costs by $5000 (source: NADA study) and drastically limit consumers' choices as popular and useful vehicles as pickup trucks and SUVs are either removed from the market or simply become unaffordable. [EPA-HQ-OAR-2010-0799-6215-A1, p. 1]

The regulations will also reduce vehicle sales and production which will reduce employment, cause people to drive their vehicles longer, and risk safety by forcing vehicles to be smaller and lighter weight. [EPA-HQ-OAR-2010-0799-6215-A1, p. 1]

I have seen first hand the incredible expense of the technologies required to meet these requirements and they are certainly not justified by the limited potential benefits in fuel savings. Even if fuel usage were drastically reduced, state and federal governments would increase the gasoline taxes to make up for the reduced gasoline tax revenue, thus negating the savings to consumers. [EPA-HQ-OAR-2010-0799-6215-A1, p. 1]

Response:

EPA disagrees with the commenter's assertion that the expense of the technologies is not justified by the potential benefits of fuel savings. Our analysis found that the benefits of the final rulemaking, including fuel savings and many other benefit categories such as the Social Cost of Carbon, far outweighed the costs of the standards. See, for example, preamble Table I-17. How state and federal governments address the impacts of this rule on gasoline taxes is beyond the scope of this rule. The benefit-cost analysis does not include sales tax, because sales tax revenues are a transfer of income, not income created or reduced by this rule.

Regarding the other points the commenter makes, we address these concerns elsewhere in our Response to Comments document: costs are addressed in Section 12.3, safety in Section 13, fuel savings in Section 18.3, vehicle sales in Section 18.7, and employment in Section 18.8.

Organization: Smith, Frank Houston

The range of impacts extend well beyond ... automotive fuel economy, lack of US parity with world CO_2/fuel economy standards NOW & post 2014, 2025 CAFE, US industrial base, US jobs creation/loss, oil imports/energy independence, balance of trade, US economic expansion without requiring TAXPAYER MONEY, preventing the demise of Det3 (& general) US auto industry post 2016, ultimately ... Our US ECONOMY … and … NATION SECURITY. [NHTSA-2010-0131-0240, p.2]

Concerns or Opportunity?

President Obama's 2012 STATE of the UNION address praised the auto industry recovery and the idea/opportunity of exporting US automotive product. [NHTSA-2010-0131-0240-A2, p.6]

Unfortunately, the EU and South Korea will require, by statute, ≤ 140 gCO_2/km in 2015 to avoid severe financial penalties (> USD $25/gram minimum over limit, in some jurisdictions increasing to almost $90/gram by 2020) for each noncompliant vehicle sold. This requires minimum fuel economy of 40 and 44 mpg(US) combine for gasoline and diesel vehicles respectively to avoid these penalties. It is reasonable to believe China and India will be following soon after. Table 4 offers an assessment of the current UK/EU market status to allow appreciation of future expectations. [NHTSA-2010-0131-0240-A2, p.6]

For reference 22.2 (the 2011 US fleet average) and 30 mpg combined are roughly 250 and 182 g CO_2/km respectively. [NHTSA-2010-0131-0240-A2, p.6]

Are there any current or proposed US manufactured vehicles that would NOT be subject to penalties when exported to those 4 regions constituting about 70% [and growing] of world automotive markets in 2011? [NHTSA-2010-0131-0240-A2, p.6]

Will these external CO_2 limits make it more difficult to export US manufactured automotive product based on foreseeable offering and emerging US powertrain technologies? See Table 4 above for UK/EU market status. [NHTSA-2010-0131-0240-A2, p.6]

This may be a serious problem ... except for the niche high end segments where price/cost is of no concern. The down side of this is that the rich can only buy a relatively limited number of vehicles per year. [NHTSA-2010-0131-0240-A2, p.6]

Response:

EPA thanks Mr. Smith for his thoughtful comment. The final standards will move automakers towards more fuel efficient vehicles and move the US toward lower GHG emissions. However, it is up to the automakers to decide how to respond to environmental standards in other countries. We believe that it is possible that the standards will facilitate meeting increasingly stringent international standards, which may reduce coordination costs, and thus overall costs for the standards. We discuss this issue in Preamble III.H.11.a.

18.1. Consumer Impacts/Consumer Welfare/Consumer Acceptance of Vehicles

Organizations Included in this Section

AAA
Alexandria Hyundai
Alliance of Automobile Manufacturers
American Fuel and Petrochemical Manufacturers (AFPM)
Applied Materials
BlueGreen Alliance
BMW of North America, LLC

Competitive Enterprise Institute (CEI)
Consumer Federation of America (CFA)
Consumer Reports
Consumers Union
Dawid, I.
Defour Group LLC
Detroit NAACP
E100 Ethanol Group
Eaton Corporation
Ecology Center
EcoMotors International, Inc.
Edmunds.com
Environmental Defense Fund (EDF
Ford Motor Company
General Motors Company
Gilles, B.
Institute for Energy Research (IER)
Institute for Policy Integrity, New York University School of Law
International Council on Clean Transportation (ICCT)
Michigan State Senate, District 18
National Association of Clean Air Agencies (NACAA)
National Automobile Dealers Association (NADA)
National Caucus of Environmental Legislators
National Wildlife Federation (NWF)
Natural Resources Defense Council (NRDC)
Northeast States for Coordinated Air Use Management (NESCAUM)
Pennsylvania State Senate et al.
Rafter, M.
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Slemp III, R. L.
U.S. Coalition for Advanced Diesel Cars
Union of Concerned Scientists (UCS)
United Automobile Workers (UAW)
Volkswagen Group of America
Volvo Car Corporation (VCC)

Organization: AAA

Since the first CAFE standard was established in 1975, automotive technologies have advanced to provide consumers with a range of choices for automobiles that meet mobility needs, are safe, and fulfill a desire for fuel economy. AAA hopes that the CAFE reforms sought under this rulemaking will continue the progress we have made as a country in improving automobiles from all perspectives. [EPA-HQ-OAR-2010-0799-9484-A1, p. 1]

AAA's interest in CAFE has always been to represent the motorist, while leaving the establishment of specific target numbers to manufacturers, researchers and policymakers. In this capacity, AAA's position and policy has remained that the federal government should establish fuel economy standards that are ambitious enough to result in marked improvements in overall efficiency but realistic enough to maintain passenger safety and consumer choice. [EPA-HQ-OAR-2010-0799-9484-A1, p. 1]

Organization: Alexandria Hyundai

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 64-68.]

Safety, reliability, styling and fuel economy are all key considerations for our customers when selecting a vehicle brand or model.

I believe our customers will continue to value and place great emphasis on fuel economy. And that is one of the reasons I generally support the proposed standards.

I have seen firsthand how customers are open to new platforms and technologies when selecting a new vehicle.

Achieving the 54.5 MPG target will most certainly require a great deal of automotive ingenuity and substantial investment on the part of all key stakeholders.

However, I am certain consumers will continue to demand improvements in fuel economy and purchase vehicles from manufacturer vehicle offerings achieving that target.

I state this example to underscore that while we must remain sensitive to cost increases, consumers will see value in and pay for advancements in technologies that improve their lives and the lives of those around them.

Organization: Alliance of Automobile Manufacturers

Even assuming that the energy cost savings will far exceed the increased up-front vehicle costs, consumer response is difficult to predict. The NPRM describes what the agencies call an "energy paradox" whereby consumers appear not to purchase products featuring levels of energy efficiency that, according to some metrics, might appear to be in their economic self-interest: [EPA-HQ-OAR-2010-0799-9487-A1, p.19]

Of 27 studies, significant numbers of them find that consumers undervalue, overvalue, or value approximately correctly the fuel savings that they will receive from improved fuel economy. The variation in the value of fuel economy in these studies is so high that it appears to be inappropriate to identify one central estimate of value from the literature. Thus, estimating consumer response to higher vehicle fuel economy is still unsettled science. Regarding consumer response to [fuel economy] labeling information on cost savings: Whether the new label will help consumers to overcome the ''energy paradox'' is not known at this point. [EPA-HQ-OAR-2010-0799-9487-A1, p.19]

Are Consumers Purchasing the Technologies Needed to Achieve the Goals of the Rulemaking? [EPA-HQ-OAR-2010-0799-9487-A1, p.23]

Of course, the ultimate question will be whether mainstream consumers will be able and willing to purchase the technologies needed to achieve this country's fuel economy energy security and environmental goals – particularly as the federal and state governments phase out many of the financial incentives that are available today.[10] The proposed regulatory language does not include this single most critical factor. Will mainstream consumers be willing and able to purchase vehicles with more fuel efficient technologies? As the NPRM states, "there is considerable uncertainty in the economics literature about the extent to which consumers value fuel savings from increased fuel economy." [EPA-HQ-OAR-2010-0799-9487-A1, p.23]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 97.]

In fact, consumer acceptance is the most critical – and unpredictable – component of advanced technology vehicle deployment. Manufacturers strive to understand how their advanced technology vehicles will be used and fueled and what combination of pricing, incentives and vehicle attributes are needed to convince mainstream consumers to invest in new technologies. [EPA-HQ-OAR-2010-0799-9487-A1, p.23]

Recognizing the critical role of customers in determining the viability of future vehicle technologies, the NAS wrote: [EPA-HQ-OAR-2010-0799-9487-A1, p.23]

Manufacturers will choose fuel economy technologies based on what they think will be most effective and best received by consumers. Customers also will have a central role in what technologies are actually chosen and will make those choices based partly on initial and operating costs. Subsidies and other incentives also can significantly impact the market acceptance rate of technologies that reduce fuel consumption. Finally, adoption of these technologies must play out in a sometimes unpredictable marketplace and policy setting, with changing standards for emissions and fuel economy, government incentives, consumer preferences, and other events impacting their adoption. Thus, the committee acknowledges that technologies downplayed here may play a bigger role than anticipated, or that technologies covered in this report may never emerge in the marketplace. [EPA-HQ-OAR-2010-0799-9487-A1, p.23]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 96-98.]

The unprecedented effort of the coming 13 years to further our country's energy and environmental goals will succeed only, only if consumers buy the fuel-efficient technologies that we will be offering.

Looking into the future, consumer purchasing patterns will be the biggest unknown. Besides fuel economy, we know that consumers demand affordability, safety, convenience and utility. One challenge we have is that fuel economy considerations often rank below those other factors. Fuel prices are especially difficult to predict and have a huge impact on how consumers weigh fuel economy at the dealership.

First, let consumers determine the winning fuels and technologies. Ultimately consumers should decide what best meets their needs. Vehicles that run on gasoline, diesel, biofuels, electricity, hydrogen and natural gas will all play a role in improving fuel efficiency and reduce greenhouse gas emissions.

---

10 - In 2011, when automakers offered 231 models that achieved 30 miles per gallon or more on the highway, these vehicles represented about 37% of U.S. sales. More than ten years after hybrids were introduced to the U.S. market, in a year when there were 38 different models of hybrids on sale in the United States, these vehicles represented only 2.1% of new vehicle sales. In 2011, the top-selling pickup truck outsold all hybrids combined by a factor of two to one. (Data in this footnote is computed based on data from www.fueleconomy.gov and from WardsAuto

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

II. NHTSA should adopt feasible CAFE standards. [EPA-HQ-OAR-2010-0799-9485-A1, p.3]

NHTSA’s authority to issue these CAFE standards is set forth at 49 U.S.C.§ 32902(b)(2)(B). That statute requires NHTSA’s CAFE standards to be “feasible” and practicable and states: [EPA-HQ-OAR-2010-0799-9485-A1, p.3]

When deciding maximum feasible average fuel economy under this section, the Secretary of Transportation shall consider technological feasibility, economic practicability, the effect of other motor vehicle standards of the government on fuel economy, and the need of the United States to conserve energy. [EPA-HQ-OAR-2010-0799-9485-A1, p.3]

In analyzing the latest round of CAFE standards, NHTSA recognized that some technologies currently have limited commercial use and require a realistic schedule for widespread commercialization to be feasible. We note that consumer acceptability is an important element of economic practicability. [EPA-HQ-OAR-2010-0799-9485-A1, p.3]

AFPM is very concerned that this proposal is based on an analysis that does not incorporate a vehicle choice model that appropriately considers the impacts of consumer choice upon industries and individuals that will be affected by the rulemaking. This is a serious deficiency that must be addressed to properly understand the implications of this proposal. EPA acknowledges this need with the following excerpt from the proposal: [EPA-HQ-OAR-2010-0799-9485-A1, p.4]

The agency hopes to evaluate those potential impacts through use of a ‘‘market shift’’ or ‘‘consumer vehicle choice’’ model, discussed in Section IV of the NPRM preamble. With an integrated market share model, the CAFE model would then estimate how the sales volumes of individual vehicle models would change in response to changes in fuel economy levels and prices throughout the light vehicle market, possibly taking into account interactions with the used vehicle market. Having done so, the model would replace the sales estimates in the original market forecast with those reflecting these model-estimated shifts, repeating the entire modeling cycle until converging on a stable solution. We seek comment on the potential for this approach to help the agency estimate sales effects for the final rule. [EPA-HQ-OAR-2010-0799-9485-A1, p.4]

Using a new consumer choice model to evaluate the impacts of the final rule is appropriate, but requires the agency to re-propose the rule and offer its revised conclusions on sales estimates and market forecasts for public comment. It is inappropriate and a violation of the Administrative Procedure Act to promulgate a final rule without first seeking comment on the changes caused by the application of the revised model. A new consumer vehicle choice model should have been peer-reviewed and then employed in this proposal to permit public review and comment on the impacts of this proposal. It is improper to propose a rule, accept comments, change the methodology for analyzing the rule’s impact and finalize the rule without providing an additional opportunity for comment on the impacts of the final rule. How can affected parties provide informed comments to the agency when the proposed rule excludes the agency’s understanding of the potential impacts of the proposed rule? Under these circumstances, the Administrative Procedure Act requires the agency to apply the vehicle choice model, describe its impact, and issue a supplemental notice of proposed rulemaking to facilitate informed comment on the potential impact of the rule. [EPA-HQ-OAR-2010-0799-9485-A1, p.4]

The agency’s failure to apply an appropriate vehicle choice model has resulted in proposed standards that are not feasible. Electrification is a good example. The following chart reflects the unwarranted optimism of attaining sufficient sales volumes for electric vehicles: [EPA-HQ-OAR-2010-0799-9485-A1, p.4] [For the associated chart please refer to EPA-HQ-OAR-2010-0799-9485-A1, p.5]

Conclusion [EPA-HQ-OAR-2010-0799-9485-A1, p.9]

AFPM believes that this rule needs to be re-proposed with the inclusion of a consumer choice model that reflects a feasible and practicable market penetration of alternative fuel vehicles. [EPA-HQ-OAR-2010-0799-9485-A1, p.9]

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 201.]

We echo the support and the comments made regarding savings for consumers. We think those are going to be very real.

Organization: BlueGreen Alliance

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 58-60.]

Based on the agencies' initial technical assessment, the net consumer savings of fuel expenditures will be very substantial and will provide much needed relief at the pump. By developing and producing advanced fuel- saving technology in the United States, automakers and suppliers can create quality jobs and provide the clean, fuel-efficient cars and light-duty trucks consumers want.

We also request continuing federal programs to support these auto industry efforts in retooling to meet the demand for cleaner, more efficient cars.

Consumers looking to purchase vehicles in the next few years are expressing interest in higher fuel economy. Building the next generation of advanced vehicles in the United States will create tens of thousands of new engineering and manufacturing jobs and strengthen America's rebounding sector.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 38.]

This standard will give Americans more advanced vehicle choices, which in turn will help consumers save money at the pump. By making it less expensive to drive, by covering the same ground but using less fuel, consumers will have more money left over to spend or invest in other economically beneficial ways.

Organization: BMW of North America, LLC

To reiterate, achievable greenhouse gas emission reductions and commensurate fuel economy increases depend on both designing more fuel-efficient vehicles AND increasing market demand for such vehicles. We can build the vehicles, but consumers must buy them. The implementation of new greenhouse gas-reducing technologies, alternative powertrains, and fuels strongly depends on customer acceptance. The proposed standards were developed based on today's best estimates of future technology, market developments, and assumed customer acceptance. A comprehensive emission reduction policy needs to consider all aspects, including the customer. [EPA-HQ-OAR-2010-0799-9579-A1, p. 3]

Organization: Competitive Enterprise Institute (CEI)

The agencies project net benefits ranging from $262 billion (assuming a 7% discount rate) to $358 billion (assuming a 3% discount rate).2 These projections are based on assumptions regarding vehicle cost, fuel prices, and consumer acceptance that may or may not be borne out by events. Skepticism is justified. If the proposed standards are as beneficial to consumers and automakers as the agencies contend, why wouldn‘t consumers demand and profit-seeking manufacturers produce vehicles built to the same or similar standards without regulatory compulsion? Fuel economy regulation assumes that auto buyers do not want to avoid pain at the pump and automakers do not want to get rich. [EPA-HQ-OAR-2010-0799-9552-A1, p. 1]

Organization: Consumer Federation of America (CFA)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 39-41.]

These potential consumer benefits come at a moment when American consumers are in desperate need of relief from rising and volatile gasoline prices. Gasoline prices set a record in 2011 in both nominal and real terms, averaging $3.53 per gallon. This week's price is a record for the month of January, and that clobbers the economy and the consumer pocketbook.

So if there is one thing you take away from this hearing today, remember this is a consumer benefit program. This is a wonderful consumer program. In fact, we estimate that 80 percent, 500 billion of the $600 billion of total benefits are the consumer savings. So this is a consumer program.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 87-89.]

I gladly appreciate the opportunity to appear today because we believe that the benefits of this proposed rule are obvious.

They lower the cost of driving and will save consumers thousands of dollars per vehicle. It will save the national economy hundreds of billions of dollars.

They lower our imports, lower our vulnerability to supply disruptions. Above all, these are a consumer-friendly set of rules. This is the consumer policy that will benefit American consumers.

Consumers will buy the new fuel-efficient vehicles enabling auto makers to reach the targets that have been set. Not because they're so beneficial in terms of economics. That's important.

But also because the rules have been written in a consumer-friendly fashion that is sensitive to the needs of the industry. And that is the backbone of the political consensus that you have heard this morning.

First, the public is concerned about gasoline and that leads to support for higher fuel economy and it changes consumer behavior.

Seventy-five percent or more of respondents to our public opinion polls. And we've conducted a dozen over the last six or seven years.

Second of all, consumers have shown a willingness to shift their buying patterns in light of recent gas price spikes.

Americans are meeting their needs for driving with vastly more fuel-efficient vehicles. They are ready to do this. They have already started, and they are way ahead of the auto industry.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 59-61.]

The car dealers say that fuel economy performance is typically not high on the consumer's list of priorities. If this were, in fact, true, why do we see so many car companies advertising fuel economy as a selling point. The car manufacturers who spend millions of dollars studying consumer behavior obviously disagree with their dealers. Fuel economy is the very top priority for consumers looking to purchase a new car. In fact, Consumers Union, the publishers of Consumer Reports, determined that fuel economy was the number two reason why consumers would change their brands of vehicle.

The NADA has said that just because vehicles can be built doesn't mean that they will be bought. Actual sales data, however, is very clear. Consumers want and will pay for more fuel-efficient vehicles. And the manufacturers supporting this new standard have agreed to make them. Consider Ford, for example. The combined sales of their two new fuel-efficient cars, the Fiesta and the Focus, in May 2011 are up 74 percent in one year.

Like everyone in the economy, car dealers are reeling from the financial setbacks. The reduction in the cost of driving from these new standards, however, will cause more autos to be sold and over 100,000 jobs to be created. More jobs and vehicles that are less expensive to drive means more consumers, not less, will be buying cars.

Consumers are desperate for more fuel-efficient vehicles. Consumer pocketbooks are hurting and more fuel-efficient vehicles will drive more and more consumers into the showroom. Right now, there are not enough fuel-efficient vehicles on the market to meet consumer demand.

V. NATIONAL COST BENEFIT: HIGHER FUEL ECONOMY STANDARDS DELIVER LARGE AND DIVERSE BENEFITS

Exhibit S-5 shows CFA's estimates of national benefits and costs. [See Exhibit S-5 on p. 7 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

The total discounted national benefits are close to $600 billion, a value that is well over three times the cost. [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

Higher fuel economy standards are primarily a consumer benefit program, with consumer savings of close to $500 billion, over 80 percent of the total national benefits. [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

Environmental and public health benefits will be almost $60 billion (just over 10 percent of the total). [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

Exhibit S-6 presents the full range of cases and scenarios considered by the agencies. It plots the costs (on the x-axis) and the benefits (on the y-axis) for the eight different target levels considered with each target level evaluated at discount rates of 3% and 7%. It also shows the results of the sensitivity analyses that were conducted at the 3% discount rate. In all, there are 28 cases/scenarios shown. The Exhibit also includes a break even line. If a case/scenario falls above the line, the benefits exceed the costs. [See Exhibit S-6 on p. 9 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, p. 8]

In every sensitivity analysis conducted by the agencies, no matter how extreme the assumptions, the benefits exceed the costs. [EPA-HQ-OAR-2010-0799-9419-A1, p. 8]

The exhibit makes it clear that the benefits are likely to exceed the costs by a wide margin. Even under the most extreme assumption – i.e. that consumer pocketbook savings are only one-quarter of the base case calculation, the benefits are almost twice as large as the costs at the 3% discount rate. [EPA-HQ-OAR-2010-0799-9419-A1, p. 8]

VIII. NHTSA AND EPA HAVE SERIOUSLY UNDERESTIMATED THE BENEFITS OF THE STANDARDS

There are both quantitative and qualitative flaws in the agency analysis that must be corrected. The analyses presented in the attached Technical Appendices reflect our independent calculation of the costs and benefits which includes corrections of the flaws in the underlying agency analyses. At the outset, we want to stress that neither the standards nor the cost benefit analyses are perfect, but the perfect must not be the enemy of the excellent. Increasing the fuel economy of the vehicle fleet to the levels proposed by the standards represents such major progress towards important national policy goals and the approach taken by the standards is so well crafted that we believe it is of the utmost importance to adopt the standards and move vigorously to implement them. Our primary concern is that the agencies have underestimated the value of the standards in several important ways. Even with the flaws, the benefits of the standards are shown to far outweigh the costs, but it is important for the final rule to correct the flaws we identify. [The Technical Appendices can be found on pp. 16-55 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, pp. 11-12]

- NHTSA will be issuing final rules periodically over the next decade and a half, and the agencies will jointly conduct a mid-course review in a decade; the errors should not be allowed to become engrained in the analytic structure. [EPA-HQ-OAR-2010-0799-9419-A1, p. 12]

While the current standards are well within the frontier of what is technologically feasible and economically practicable (which are two key standards that in the authorizing legislation for NHTSA), over time, the standards may move closer to the frontier. [EPA-HQ-OAR-2010-0799-9419-A1, p. 12]

- As the fuel economy standards rise, they will be closer to the economic margin, which will make it more important for the agencies to get it right, so that future rules do not demur from setting standards that are in the public interest because benefits have been underestimated. [EPA-HQ-OAR-2010-0799-9419-A1, p. 12]

The agencies need to articulate the analytic justification for the standards more clearly and forcefully. The Preliminary Regulatory Impact Analysis contains a lengthy discussion of what has been called the "efficiency gap" or the "efficiency paradox" for several decades. In many ways, this discussion is far superior to earlier discussions in the sense that it recognizes there are both supply-side and demand-side factors that may cause the market for new autos to under invest in fuel economy technologies. The "efficiency gap" is identified by the economic/engineering analysis, where, under reasonable and realistic assumptions about cost and value, there are many technologies available that would produce substantial net benefits to consumers if they were included in the new vehicles. The failure of the auto market to include these technologies raises the question of why, in a capitalist economy, where markets are presumed to be efficient, so much economic value is left unrealized. The answer, as we have pointed out in the all of the recent rulemakings dealing with the fuel economy of light duty vehicles is that there are market imperfections that suppress investment in fuel efficient technologies. [EPA-HQ-OAR-2010-0799-9419-A1, p. 12]

Our earlier analyses are summarized in Exhibit S-9. The imperfections [See Exhibit S-9 on p. 13 of Docket number EPA-HQ-OAR-2010-0799-9419-A1]

- affect both the demand side and the supply-side of the light duty vehicle market,
- go well beyond the problems of externalities and information problems, and
- include significant market structural conditions, transaction costs and behavioral factors. [EPA-HQ-OAR-2010-0799-9419-A1, p. 12]

The fact that the market has begun to move in the right direction is encouraging. The fact that it has taken almost a doubling of the cost of gasoline in real terms to get it to move is testimony to the strength of the barriers to optimal investment in fuel economy in the market. In spite of the fact that the agency discussion of market imperfections is incomplete, the agencies conclude, correctly, that the base case analysis should be the pillar on which the choice of a standard rests. We agree with that conclusion. The agencies treat the base case with a 3% discount rate as the starting point for the sensitivity analysis. [EPA-HQ-OAR-2010-0799-9419-A1, p. 12]

We do not agree with the decision to conduct a "fudge" factor analysis that arbitrarily slashed the size of the efficiency gap and the magnitude of consumer welfare gains. The analysis offers no empirical justification for doing so. Moreover, the general discussion of consumer welfare combined with the traditional sensitivity analysis has already addressed the underlying uncertainties. Uncertainties about the price of gasoline, the cost and effectiveness of technologies, the value of externalities are already incorporated in the sensitivity analysis. The "fudge" factor analysis is unnecessary and double counts uncertainty. [EPA-HQ-OAR-2010-0799-9419-A1, p. 12]

Organization: Consumer Reports

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 165-166.]

It is our view that implementing these proposed fuel economy standards, will increase vehicle choice and provide consumers with more efficient and alternative fuel vehicles.

In a recent Consumer Reports survey, consumers demonstrated a strong support for fuel economy standards and alternative fuel vehicles and a willingness to pay more for these technologies.

Consumers want it all. They want function, performance, a variety of choices, and better fuel economy. And they have indicated that they'd rather pay slightly more for these vehicles if it means they would save money at the gas pump.

According to the survey, 93 percent believe that the fuel efficiency standards for all vehicles should be improved. Nearly 80 percent support the 55 miles per gallon target for the fleet by 2025.

As the availability of these vehicles, many consumers would buy or consider an alternative fuel vehicle such as a hybrid, electric vehicle or natural gas.

Organization: Consumers Union

Finally, the standards are likely to improve the choices available to consumers. Because CAFE standards are now footprint-based, improvements are required across all vehicle sizes, so each class of car will likely see efficiency gains. Because the standards are scaled by size, there is no incentive for automakers to downsize vehicles. Consumers will have more efficient options across vehicle classes and are likely to see more partially and fully electrified options from many or all automakers. [EPA-HQ-OAR-2010-0799-9454-A2, p.3]

II. Consumers support a strong CAFE standard

Improving fuel economy also provides intangible benefits and acts as insurance against unstable oil prices. Uncertainty in fuel prices and price spikes take an emotional toll that is not easily captured in modeling or consumer choice analysis. Spikes in gasoline prices cause immediate and keenly noticed financial pain for many consumers. Consumers support improving fuel economy in large part because it provides peace of mind by improving energy security for individual consumers and the nation. The CAFE program is an effective, proactive option when it comes to dealing with rising gas prices. [EPA-HQ-OAR-2010-0799-9454-A2, p.3]

In a recent Consumer Reports survey, consumers demonstrated strong support for fuel efficiency standards, a desire for alternative fuel vehicle options and a willingness to pay for more efficient technology.7 Consumers want it all—function, performance, a variety of choices and better fuel economy, and they would rather pay more for a vehicle in order to save on gasoline. According to the nationally representative survey conducted in October 2011: 93% believe that fuel efficiency standards for all vehicles should be improved; 80% support at least 55 mpg as a target fleet average for 2025; as availability improves, 72% ofconsumers who plan to buy a vehicle would consider an alternative power train, such as hybrid, electric, flex-fuel or natural gas; and

83% are willing to pay extra for more fuel efficient vehicle if the payback from lower fuel costs is less than five years.8 [EPA-HQ-OAR-2010-0799-9454-A2, pp.3-4]

Although surveys have limitations in capturing consumer preferences, relying solely on market data for consumer preferences is imperfect as well. Consumers are not satisfied with the status quo, but they generally must buy a vehicle from the available fleet. By expressing support for improved standards, they are essentially stating a preference for better options in the future. A strong CAFE program gives credence to this consumer preference that is not being communicated effectively in the marketplace. [EPA-HQ-OAR-2010-0799-9454-A2, p.4]

It is true that when gas prices are relatively low, consumers tend to put less emphasis on fuel economy when buying a car. But as we saw in 2008, when gas prices soar, consumers quickly try and sell their gas guzzler and buy a more fuel efficient vehicle. Unfortunately, vehicle manufacturers cannot design, build and supply different vehicles on a monthly basis. A typical model cycle is about five years, and to take the best advantage of all the weight saving and new fuel efficient technologies, these decisions need to be made at the beginning of a model concept and cannot be easily retrofitted. The CAFE standard targets for 2017-2025 give manufacturers a predictable roadmap and the impetus to incorporate these technologies and sell desirable vehicles that achieve better fuel economy and save consumers money in the future. [EPA-HQ-OAR-2010-0799-9454-A2, p.4]

---

7 - See Appendix D Consumer Reports Fuel Economy Poll November 2011 for full survey report.

8 - See Appendix D at 16.

Organization: Dawid, I.

Its' clear that Detroit and the overseas manufacturers can meet the 54.5 mpg regulation. What's NOT clear is whether the market wants them! [EPA-HQ-OAR-2010-0799-6325-A1, p. 1]

We know 2 things: new EV, EREV, and hybrids sell at a premium cost. Consumers determine whether to purchase them, or a comparable, ICE model at a significantly lower price, based on:

1. Price of gas

2. How high the premium is. [EPA-HQ-OAR-2010-0799-6325-A1, p. 1]

I urge the EPA to consider how the market affects the marketability of the vehicles they regulate. [EPA-HQ-OAR-2010-0799-6325-A1, p. 1]

Organization: Defour Group LLC

I. Willingness to Pay for Fuel Economy: Revealed Preference

The agencies erroneously assume that auto buyers will be willing to pay for 100% of their projected fuel economy gains. The real-world impact of the proposed standards, however, flow from actual consumer purchase decisions. There is a great deal of research supporting our conclusion that consumers are not willing to pay 100% for fuel economy gains. Thus, our first correction to the agencies' analysis is based on real-world or revealed preference willingness to pay at $3.54 per gallon regular unleaded fuel, the price the agencies use to project their benefit and cost estimates for MY 2025 vehicles. [EPA-HQ-OAR-2010-0799-9319-A1 p.2]

We utilize a 25% U.S. consumer willingness to pay for fuel efficiency technology improvements. We derive this estimate from the MIT study, *On the Road in 2035*, which was published in 2008 and found that U.S. consumers are not willing to spend any of the increases in the value of fuel efficiency technologies – the value of increases in gallons per ton mile -- on fuel economy (miles per gallon), but rather would prefer to spend all of the value of any potential gains on other vehicle attributes of greater value to them such as improved performance, carrying capacity, towing capacity, comfort, and safety. [EPA-HQ-OAR-2010-0799-9319-A1 p.2]

They also found that European consumers are willing to spend roughly 50% of any gains in fuel efficiency on fuel economy and prefer to spend the rest of any such gains on the afore-mentioned other vehicle attributes.[1] Their study was for the years 1995- 2006 -- years in which U.S. regular unleaded gasoline sold for an average $2.07 per gallon ($2009) and European premium unleaded fuel prices that power most of their gasolinepowered vehicles sold for an average of $5.15 per gallon (median of $5.30 per gallon). The actual relevant fuel cost in Europe, of course, is much higher when their substantial engine displacement taxes are factored in. [EPA-HQ-OAR-2010-0799-9319-A1 p.2]

We conservatively assume a $5.50 per gallon average price in Europe as the level of fuel prices at which auto buyers will be willing to take – i.e. pay for -- 50% of fuel efficiency gains as fuel economy improvements, and $2.10 per gallon as the price at which they are willing to pay for no increases in vehicle mpg. This gives us a midpoint estimate of about $3.80 per gallon as the point at which auto buyers are willing to spend 25% of any increase in fuel efficiency on fuel economy. NHTSA uses a gasoline price of $3.54 per gallon as their projection for MY 2025, so our estimate of willingness to pay is somewhat overstated. [EPA-HQ-OAR-2010-0799-9319-A1 p.2]

II. Private Benefits vs. Private Costs of the Proposed Standard Lower Bound Estimate

In their Preliminary Regulatory Impact Analysis (PRIA) the National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (EPA) find that U.S auto buyers will be willing to pay $6,000 per vehicle for standards achieving a combined 49.6 mpg in MY 2025 (56.0 mpg for cars and 40.3 mpg for light trucks) at $3.54 per gallon gasoline ($2009) – or $4,200 more than their estimated $1,800 per vehicle increase in retail price.[2] We first multiply the agencies' estimate of $6,000 per vehicle present discounted fuel savings by the 25% willingness to pay, which comes to a revised estimate of $1,500 per vehicle. The literature also shows that their estimate of the retail price increase necessitated by the proposed standards, or $1,800 per vehicle, is too low by at least 60%.[3] Making just these two adjustments off their baseline of MY 2016 34.1 mpg results in a $4,500 per vehicle *reduction* in willingness to pay to

$1500 per vehicle, and a $1,100 per vehicle *increase* in retail price to $2,900 per vehicle (all estimates rounded to the nearest $100 per vehicle). The fuel savings for a 49.6 mpg MY 2025 are worth $1500 per vehicle, but it costs $2900 to get them. [EPA-HQ-OAR-2010-0799-9319-A1 p.3]

Net willingness to pay, the bottom-line number and what the agencies call "net lifetime owner fuel savings," or the difference between the present value of the expected fuel savings less the increased retail price of the vehicle, is a *negative* $1,400. [EPA-HQ-OAR-2010-0799-9319-A1 p.3]

For our lower bound estimate, we further adjust willingness to pay for more realistic assumptions for the rebound effect and for consumer interest rates. The agencies assume a rebound effect of 10% and a discount rate of 3% for the above estimates. Using a mainstream historical literature estimate of 20% for the rebound effect and assuming the historical, long-term consumer auto loan rate of 9%, we further reduce willingness to pay from 25% to 15% of the agencies estimates $6,000 per vehicle. This yields a bottomline willingness to pay of $900 per vehicle and a net consumer or private welfare loss of $1,900 per vehicle. [EPA-HQ-OAR-2010-0799-9319-A1 p.3]

Mid-Range Estimate

Defour estimated willingness to pay in a study of the proposed standards that has been accepted for publication by the Society of Automotive Engineers and that was derived from the agencies' earlier estimates of consumer benefits and costs in their Joint Technical Assessment Report (JTAR).[4] Our estimates are for a scenario comparable to that of the Preferred Alternative, and which approximates the 51 mpg scenario in the Joint Technical Assessment Report. Adjusting their estimates of benefits for the 25% willingness to pay and for technology costs contained in the National Research Council's 2010 report,[5] we found consumer welfare losses of $2,900 per vehicle – our minimum estimate for the JTAR's 4% growth scenarios. (There were four scenarios with losses ranging from $2,900 to $3,200 per vehicle.) Of course, a lower and more realistic baseline beyond which fuel economy standards become binding constraints would imply a still higher retail price increase and still higher losses in consumer welfare or net willingness to pay. That is why we call this a "mid-range" estimate. [EPA-HQ-OAR-2010-0799-9319-A1 p.4]

Reality Check

To subject these estimates to other authoritative sources, we compare our results to a study by the Energy Information Administration (EIA). In its 2011 Energy Outlook,[6] the EIA concluded that a CAFE standard of 46.1 mpg (3.5 mpg lower than the proposed 2025 standard) would result in an 8% loss in new vehicle sales in 2025. Congress established the Energy Information Administration as a source of independent estimates of the impacts of alternative governmental policies, including the corporate average fuel economy standards. Applying the agencies' unitary new vehicle price elasticity estimate implies an equal and opposite percentage increase in prices, which on the average $28,000 vehicle transaction price comes to $2,200 per vehicle. The EIA's estimate is for a 46.1 mpg standard, which is 12 mpg above the baseline 34.1 mpg for MY 2016. Assuming a straight-line welfare loss yields an estimate of $2,900 per vehicle. Of course, the straight-line assumption understates the actual cost increase because of the laws of diminishing marginal returns and increasing marginal costs. [EPA-HQ-OAR-2010-0799-9319-A1 p.4]

Figure 1 compares estimates of consumer willingness to pay (PV Benefits), retail price increase, and net willingness to pay (NPV Benefits) for the proposed MY 2025 fuel economy mandate under our three alternative methodologies. (We are only able to infer net lifetime owner savings values from the EIA study.) The agencies' estimates of benefits, as shown by the vertical blue line for PRIA are 6 times higher than our midrange estimate, while our mid-range estimate for the requisite retail price increase is roughly twice the agencies'. The bottom line estimate, NPV Benefits, the increase in willingness to pay less the increase in retail price on MY 2025 vehicles, ranges from the *loss* of $1,900 to $2,900 per vehicle to the positive *gain* of $4,200 per vehicle in the PRIA. [Please refer to EPA-HQ-OAR-2010-0799-9319-A1 p.5 for Figure 1.] [EPA-HQ-OAR-2010-0799-9319-A1 p.5]

Both our estimates and those inferred from the EIA study are considerably understated when compared to those implied by the research of economists at Resources for the Future (RFF), the Environmental Protection Agency, and at the Congressional Budget Office – research that the agencies did not but should consider in this rulemaking. [EPA-HQ-OAR-2010-0799-9319-A1 p.5]

An RFF November 2010 study co-authored by David Evans of the EPA,[7] finds that "using standards to cut fuel use by 5 percent under a standard value for CO_2 damages is warranted only if consumers fail to internalize 44 percent of the savings from fuel economy. In fact recent rulings that rapidly ramp up the corporate average fuel economy CAFE standards are not supported on welfare grounds, even under our bounding case for market failures. . . . In our bounding case for these failures, a standard that cut fuel use by 8.9 percent would be optimal, though potential welfare gains are only about a third of those for the fuel tax." [EPA-HQ-OAR-2010-0799-9319-A1 p.6]

Dr. Evans and co-authors assume a baseline free expression combined fleet fuel economy level of 23 mpg and the 5% and 8.9% reductions in fuel consumption represent 10 to 36% of the 25% cut mandated by the 2012- 2016 MY standards relative to that baseline. They find that the marginal welfare costs of increasing the standards rapidly escalate to $6 per gallon and higher well before required fuel savings approaches the 25% that would be achieved under the MY 2016 standards. Going another 12.9 mpg to MY 2025 standards would dramatically increase these estimates. [EPA-HQ-OAR-2010-0799-9319-A1 p.6]

Earlier studies by economists at RFF and the Congressional Budget Office came to similar conclusions, finding that raising mandated fuel economy levels like those proposed would impose very substantial welfare losses on consumers and on the broader economy.[8] These conclusions are summarized in the survey of mainstream research by economists at Resources for the Future, which was published in the *Journal of Economic Literature*, the leading survey journal for economic scholars, It is important to note that the authors address much smaller increases in the standards than here and from a much lower base mpg. The authors concluded:

Whether higher fuel-economy standards would increase or reduce efficiency or have little effect remains unsettled. Kleit (2004) and Austin and Dinan (2005) find that costs from binding increases in standards of 3−4 miles per gallon would cost around $3−4 billion or more, assuming market adoption of all privately cost-effective technologies. Higher fuel-economy standards significantly increase efficiency only if carbon and oil dependence externalities greatly exceed the mainstream estimates in Table 2, or if consumers perceive only about a third of the actual fuel-economy benefits (Fischer, Harrington, and Parry 2006).[9] [EPA-HQ-OAR-2010-0799-9319-A1 p.6]

IX Summary and Conclusions

The agencies find net positive owner lifetime fuel savings or "willingness to pay" of $4,200 per vehicle in part because they ignore consumer tradeoffs between fuel economy and other vehicle attributes and assume auto buyers are willing to pay for 100% of the agencies' projected fuel efficiency technology gains to 2025. But mainstream research shows that at fuel prices of the projected $3.54 per gallon consumers will be willing to pay for no more than 25% of any potential fuel economy improvements. When this adjustment is made, when further adjustments for a more realistic rebound effect and discount rate are made, and when the agencies' estimate of retail technology costs is increased by a factor of 60% to reflect real-world retail price mark ups, we find the agencies' Preferred Alternative for MY 2025 standards imposes net private welfare losses of at least $2,900 per vehicle. [EPA-HQ-OAR-2010-0799-9319-A1 p.20]

Applying agency estimates of vehicle price elasticities and employment multiplier effects shows that the $2,900 per vehicle net consumer welfare cost will cause a loss of more than 1.8 million industry sales and more than 200,000 industry, supplier, and dealer jobs. The proposal is extremely regressive -- imposing disproportionately higher hardships on those who are the poorest and least able to afford personal transportation. Fuel prices well above $5.00 per gallon are necessary if consumers are to embrace these standards and eliminate the adverse impacts on sales and employment. [EPA-HQ-OAR-2010-0799-9319-A1 p.20]

Use of a more realistic estimate for the rebound effect and incorporation of a similarly realistic estimate of the clunker effect increases the agencies' already negative estimate of social benefits from a minus $100 per vehicle to minus $900 per vehicle. [EPA-HQ-OAR-2010-0799-9319-A1 p.20]

These results are consistent with the findings of numerous studies by economists at the Energy Information Administration, Resources for the Future, the Congressional Budget Office, and even the Environmental Protection Agency. Those studies show that improving consumer and social welfare requires a reduction, not an increase in the standards from MY 2016 levels. [EPA-HQ-OAR-2010-0799-9319-A1 p.20]

In the public interest, it is incumbent on the agencies to consider all of these studies their rulemaking. [EPA-HQ-OAR-2010-0799-9319-A1 p.20]

Based on real-world, revealed auto buyer preferences, we find that the proposed MY 2025 49.6 mpg fuel economy standard for the combined passenger car and light truck fleet will result in net consumer welfare losses of at least $2,900 per vehicle relative to the base MY 2016. This compares to the Preliminary Regulatory Impact Analysis' (PRIA's) estimate of net positive private benefits of $4,200 per vehicle. (All estimates are rounded to the nearest $100 per vehicle.) We find that implementation of the MY 2025 fuel economy standards will result in a loss of more than 1.8 million industry sales and a loss of more than 200,000 jobs in auto manufacturing, supply and retail distribution. [EPA-HQ-OAR-2010-0799-9319-A1, p. 1]

We also find that the standard will impose additional net social externality costs of more than $900 per vehicle versus an agency net cost estimate of $100 per vehicle. We estimate the sum of net private and social welfare *costs* to be more than $3,800 per vehicle. This compares to the agencies' estimate of $4,100 in net private and social *benefits* per vehicle. We find that the fuel economy standards are extremely regressive, imposing markedly disproportionate costs on the group of lowest-income households relative to those imposed on the highest-income households. [EPA-HQ-OAR-2010-0799-9319-A1, p. 1]

Our findings of substantial private net welfare losses result from a much:

- Lower, real-word assessment of auto buyer willingness to pay, and
- Higher, real-world assessment of markups from direct manufacturing cost to retail consumer price than the agencies assume in their engineering/mathematical model.

Our findings of substantially higher net societal costs follow from higher and more realistic estimates of the rebound effect –the offsetting impact of higher fuel economy on vehicle miles traveled and thus fuel consumption -- and from taking account of the "clunker effect," or the impact of higher new vehicle prices on encouraging the retention of older and higher emitting vehicles. [EPA-HQ-OAR-2010-0799-9319-A1, p. 1]

We find that fuel prices well above $5.00 per gallon would be required to render the standards "consumer friendly." We conclude that consumer or societal welfare is optimized at a level below the MY 2016 fuel economy standards. All of our findings are supported by mainstream research at leading governmental and academic institutions, including the Energy Information Administration, the Congressional Budget Office, Resources for the Future, and the Environmental Protection Agency. We urge the agencies to consider all of this research in finalizing their proposed rule. [EPA-HQ-OAR-2010-0799-9319-A1, p. 1]

III. Fuel Prices and Willingness to Pay

The next question is what fuel price would be necessary for auto buyers to freely purchase a combined fleet with 49.6 mpg fuel economy? [EPA-HQ-OAR-2010-0799-9319-A1, p. 7]

The short answer is "well in excess of $5.00 per gallon." As shown in Figure 2 below, the Energy Information Administration projects unconstrained or free expression levels of fuel economy for MY 2025 at 35.3 mpg for $3.54 gasoline (40.0 mpg for cars and 29.6 mpg for light trucks). It also finds that at $5.12 per gallon -- its highest fuel price scenario for 2025 -- the combined new vehicle fleet would attain 36.8 mpg with cars at 41.1 mpg and light trucks at 30.4 mpg, well below the agencies' proposed mandate.[10] [EPA-HQ-OAR-2010-0799-9319-A1, p. 7]

Another estimate is provided by the European experience with much higher fuel prices when there were no fuel economy regulations. Estimates of willingness to pay at higher fuel prices can be derived from European levels of fuel economy that existed in the late 1990s and early 2000s, before their standards became binding and which thus represent free expression levels that their consumers would be willing to pay for. Customer demand for passenger cars never exceeded 40 mpg – well below the agencies' projection of a 56.0 mpg achievable level in 2025 -- and this was so even with $7 and $8 per gallon gasoline, with heavy engine displacement taxes, and with substantial subsidies for diesel fuel. [EPA-HQ-OAR-2010-0799-9319-A1, p. 7]

A third estimate can be inferred from a 2010 study by the National Research Council, which found that if consumers were willing to pay for 50% of potential fuel economy improvements the government could achieve a level of just 40 mpg for combined cars and light trucks and in MY 2035. This was at the $5.50 or higher fuel price equivalents for the study period of 1995 to 2006.[11] Of course, the 50% willingness to pay is more than double the 25% willingness to pay we derived from the MIT study cited above, and the learning curve effect means that 2025 technologies will cost more than the NRC's estimate for MY 2035. [EPA-HQ-OAR-2010-0799-9319-A1, p. 7] [For figure 2 please refer to EPA-HQ-OAR-2010-0799-9319-A1, p. 8.]

---

1 - Laboratory for Energy and the Environment, On the Road in 2035: Reducing Transportation's Petroleum Consumption and GHG Emissions, Massachusetts Institute of Technology, July 2008, pages 61 and 156-157.

2 - Derived from Table VIII-27b, page 715 of the NHTSA PRIA. See also "Dealers Fight Mileage Rules," The Wall Street Journal, January 28, 2012. The mandated level is 49.6 mpg. The agencies estimate that consumers will also be willing to pay for achieved levels of 56.0 mpg for MY 2025 cars and 40.3 mpg for MY 2025 light trucks. We derive a slightly lower estimate of the retail price increase, or $1,800 per vehicle versus the $2,000 per vehicle reported in the article. We derive a slightly lower estimate of $4,200 willingness to pay than the reported $4400 per vehicle.

3 - National Research Council, Assessment of Fuel Economic Technologies for Light-Duty Vehicles (2011), pages 24-26.

4 - Dean Drake, David Aldorfer, Michael Whinihan, and Thomas Walton, "Using Economic Analysis to Assess the Viability of Post-2016 MY Greenhouse Gas Emission and Fuel Economy Standards for Light Duty Vehicles," Paper #2012-01-0754, Society of Automotive Engineers, Forthcoming.

5 - National Research Council, America's Energy Future (2010), Tables 4.3 and 4.4.

6 - Energy Information Administration, "Increasing light-duty vehicle greenhouse gas and fuel economy standards for model years 2017 to 2025," (2011).

7 - Ian Parry, David Evans, and Wallace Oates, "Are Energy Efficiency Standards Justified?" Resources for the Future Discussion Paper 10-59, November 23, 2010 at http://www.rff.org/documents/RFF-DP-10-59.pdf

8 - See, in particular, Fischer, Harrington, and Parry, "Should Corporate Average Fuel Economy Standards (CAFÉ) be Tightened?" Energy Journal (2007) at http://www.rff.org/documents/RFF-DP-04-53-REV.pdf at and Harrington, Parry, and Walls, "Automobile Externalities and Policies," Journal of Economic Literature (2007), and David Austin and Terry Dinan, "Clearing the Air: The Costs and Consequences of Higher CAFÉ Standards and Increased Gasoline Taxes," Journal of Environmental Economics and Management (2005). The Journal of Economic Literature article is a survey of the leading economic studies in the field, and David Sandalow, Freedom from Oil: How the Next President Can End the United States' Oil Addiction, Brookings (2008).

9 - Harrington et al, Ibid.

10 - Energy Information Administration, Annual Energy Outlook 2011, page 71.

11 - National Research Council, America's Energy Future (2010), Tables 4.3 and 4.4.

VII. The "Energy Paradox" and Willingness to Pay

The agencies suggest that consumer myopia – auto buyer systematic undervaluation of future fuel economy benefits -- and not any errors in their analysis, explains what they call the "Energy Paradox," or why today's auto buyers would be "hesitant" to buy vehicles that achieve 49.6 mpg on average and provide, by their reckoning, more than $4,000 worth of fuel savings net of retail price increases. [EPA-HQ-OAR-2010-0799-9319-A1, p. 14]

The Congressional Budget Office (CBO), in a study commissioned by the U.S. Senate in 2002, addressed this contention, noting that many proponents of increased fuel economy standards argue that the market for fuel economy is inefficient because consumers either "lack information about vehicles' fuel efficiency or that producers lack an incentive to respond to consumers' preferences for fuel efficiency." The CBO concluded:

"Most economists do not believe that either assumption is valid. Vehicles' current level of fuel efficiency most likely reflects consumers' trade-offs between fuel economy and other characteristics that drivers want, such as vehicle size, horsepower, and safety. The same technologies that can be used to boost fuel economy can be used to hold fuel economy constant while increasing the vehicles' weight, size, or power. Thus, the fact that producers have done the latter rather than the former in recent years suggest that they have responded to buyers' preferences by targeting available technologies toward other features that consumers desire. Raising CAFE standards would impose costs on both consumers and automobile producers by forcing improvements in fuel economy that car buyers may not want."[22] [EPA-HQ-OAR-2010-0799-9319-A1, p. 14]

Or, to quote the most recent, and we believe, most definitive study of this issue by economists at MIT and Northwestern University:

We find little evidence that consumers "undervalue" future gasoline costs when purchasing cars. The implied discount rates we calculate correspond reasonably closely to interest rates that customers pay when they finance their car purchases.[23] [EPA-HQ-OAR-2010-0799-9319-A1, p. 14]

Whether or not auto buyers know what they are doing, their choices do, in the final analysis, determine the demand for new cars and light trucks in the marketplace. When, for whatever reason, their willingness to pay for increased fuel economy falls short of the increased retail vehicle price necessary to attain that level, industry sales losses necessarily ensue, as the EIA analysis found.[24] This is so even if better informed and more intelligent auto buyers would be willing to pay for 100% of the "cost-effective" fuel efficiency gains assumed in the agencies' mathematical model. [EPA-HQ-OAR-2010-0799-9319-A1, p. 15]

Moreover, if the mainstream studies that we cited are correct, the standards cannot be justified on benefit-cost grounds even if the supposed consumer undervaluations are corrected using the literature's most optimistic, "upper bound" assumptions and even using the most optimistic, "upper bound" assumptions regarding externality costs of climate change and energy security.[25] There is no basis for increasing the standard – neither on the consumers' behalf nor on the public's behalf. The proposed increase will make everyone worse off. As these studies demonstrate, improving either consumer or societal welfare requires a *reduction*, not an increase in the standards from MY 2016 levels. [EPA-HQ-OAR-2010-0799-9319-A1, p. 15]

---

22 - Congressional Budget Office, A CBO Study: Reducing Gasoline Consumption: Three Policy Options (November 2002), Chapter 2, page 2. (Emphasis added)

23 - Meghan Busse, Christopher Knittel, and Florian Zettlemeyer, "Pain at the Pump: The Effect of Gasoline Prices on New and Used Automobile Markets," University of California Energy Institute, UC Davis Institute of Transportation Studies and National Bureau of Economic Research (September 2"011), page 2.

24 - See text accompanying supra note 6.

25 - See text accompanying supra notes 7-9.

Organization: Detroit NAACP

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 140-141.]

So, for us, you know, this is about countenance. For the NAACP these proposed standards will help families, families with passenger cars, light trucks, SUVs. It will help them save money, put more money back in your pocket. To extend the standards enacted last year that cover vehicles sold in 2012-2016 will raise the average fuel economy by 2016, but the first ever fuel-efficiency standards for medium- and heavy-duty trucks from 2014 to 2018 will also be enacted this year. So, the common sense standards that are represented here will be our largest reduction in oil consumption in the history of the United States of America.

As I said earlier, the average American household spends approximately $2,000 per year on gasoline. I don't know if I have $2,000 a year to spend on gasoline anymore, but the daily gasoline costs in the United States is astronomical. And adopting these standards of fuel efficiency and emissions performance, to take it to 54.5 miles per gallon by 2025 will save me, my mom, my family and consumers across the country about $6,000 a year, maybe more, which is very significant, and when it can go to so many other places to do so many other positive things other than going to a foreign oil distributor.

Organization: E100 Ethanol Group

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 202-203.]

Depending on electric cars to meet the program's objectives is a quote 'big bet; a huge bet,' end of quote. That is a direct quote from Bill Ford, Jr., Chairman of the Ford Motor Company at a talk that he gave at the Commonwealth Club here in San Francisco last October 27 about his agenda.

Current lithium ion battery vehicles are not selling. Only 17,345 of the almost 13 million light-duty vehicles sold in 2011 were Chevy Volts and Nissan Leafs, a little more than one-tenth of 1%. The Volt base price is $40,000 and the Leaf's is $36,050 after their large price increase in December.

Comparably-sized and equipped gasoline versions of these vehicles, the Chevy Cruz and Nissan Versa, are at least $20,000 less than the price of the electrics.

So the question becomes, will millions of consumers spend $20,000 up front to save the $8200 over the life of the proposed standards? The answer, we believe, is clearly not.

Organization: Eaton Corporation

Allows OEM to bring safe, affordable vehicles to market that customers want to purchase. [EPA-HQ-OAR-2010-0799-9494-A1, p. 2]

Organization: Ecology Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 189.]

but that they will also lead to big savings by consumers at the pump as well as to the economy generally. The estimated consumer savings of approximately $3,000 to $4,400 in net lifetime savings is almost certainly a conservative estimate when considering likely increases in the fuel prices and improvements in technology. The estimated social level benefits of $311 to $421 billion are, therefore, likely conservative as well. We certainly think that consumers and businesses alike who rely on transportation will all significantly benefit from having the 300-plus billion dollars more in their pocketbooks to spend on other things.

Organization: EcoMotors International, Inc.

The agencies have gone to great lengths in the Proposed Rule to stress how they have designed the standards to preserve consumer choice. EcoMotors suggests that EPA go a step further by acknowledging consumers' preference for familiar vehicle technologies and building in additional compliance flexibilities to enable OEMs to choose alternative advanced technology paths for achieving the same CO_2 reductions and fuel economy improvements. OEMs should not be forced to produce vehicles that consumers may not want. Furthermore, if consumers are dissatisfied with the range or price of LDVs being offered, they could choose to keep their existing vehicles longer, reducing new vehicle sales and resulting in increased GHG emissions - a scenario that could be avoided if EPA were less aggressive in promoting a small, select group of hybrids. [EPA-HQ-OAR-2010-0799-9594-A2, p. 6]

If a vehicle technology doesn't create a value proposition all the way through to the customer base, it will not succeed. Market forces will ultimately drive consumers' vehicle decisions - not intangible regulatory credits and incentives that only benefit automotive manufacturers. If there is not enough consumer demand for EVs, PHEVs and FCVs today, how will consumers react to even more expensive, high-mileage vehicles in the future? The agencies risk undermining their ultimate energy and environmental objectives if they fail to acknowledge this fact, and choose to remain firmly wedded to promoting only a small group of unfamiliar and expensive technologies - EVs, PHEVs and FCVs. [EPA-HQ-OAR-2010-0799-9594-A2, p. 6]

Organization: Edmunds.com

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 102-104.]

Our second point is that, by their nature, the proposed CAFE standards force automakers to focus their efforts on improving fuel economy. This dictates the nature of competition. Automakers focus on fuel economy rather than letting consumer preferences determine on what basis they compete. This focus on fuel economy for all automakers limits competition in other dimensions, such as safety, comfort, performance, design and electronics. In fact, the focus on fuel economy could limit the innovation of these other features, especially for automakers that have fewer resources or that need to work relatively harder to meet their fuel economy target. Moreover, the proposed rules have the potential to limit innovation of fuel economy itself by offering favored status to certain technologies via special credits, which could then deter automakers from developing other technologies.

First, the current proposal needs to address the potential consequences of mandated increased focus on fuel economy for competition and innovation in the automotive industry. The proposed rules need to more fully explore how such consequences could force consumers to make sacrifices to get the desired emissions results.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 100-103.]

Many parties involved in the CAFE process have asserted why the proposed rules should make sense for consumers, why consumers should embrace these rules, how consumers should benefit from these rules, despite higher vehicle prices, and so on. The problem is that while they purport to represent consumers, these parties typically do not represent consumers. In our view, it's better to go straight to the source, rather than to presume to know what is best for a particular group.

First of all, the improved fuel economy results for the proposed CAFE standards for 2017 to 2025 are based on production forecasts and do not account for how consumer demand for and willingness to pay for fuel economy will keep pace with the more fuel-efficient fleet built. To date, consumers have demonstrated relatively little preference for high-mileage vehicles, and then usually just for brief periods during high gas prices. If reality differs significantly from key assumptions used in these forecasts, for example, if gas prices drop and consumer demand for fuel efficiency then decreases, a disconnect could arise between what consumers want and what automakers supply under the proposed standard. This has the potential to result in more limited choice, higher prices, and decreased auto sales.

Our third point is that the multiple measures of MPG that have emerged from the rulemaking process add excessive complexity to the consumer decision-making process, making it harder, not easier, for consumers to assess fuel economy, compare vehicles, and decide which vehicle works best for them.

Organization: Environmental Defense Fund (EDF)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 287.]

With respect to economic security, again, combined with the Phase I standards, the proposed rule will provide families with more than $8,000 in fuel savings over the lifetime of the new vehicle by 2025, for a total of $1.7 seven trillion and national fuel savings over the life of the program.

Organization: Ford Motor Company

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 43-44.]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 32.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 85-86.]

The key is to ensure that the proposed targets do not outpace consumer demand or the affordability of the technologies needed for compliance. As a full-line manufacturer, we are challenged to meet a broad range of customer wants, such as function, performance, comfort and convenience, safety and fuel economy. And all these attributes need to come together in a line of vehicles that consumers can afford. After all, attainment of our national goals for CO_2 reduction and energy security cannot be met by niche products and technologies. It does little good to produce vehicles with improved fuel efficiency unless those vehicles are actually purchased by a wide range of American consumers. Further, the technologies must be self-sustaining in the marketplace and not dependent on long-term government subsidies.

We must also acknowledge that market success is dependent upon many factors outside of our control, such as the price of fuel, the state of the economy or the availability of affordable technologies and materials. The further we look into the future, the more difficult it is to predict these factors with accuracy.

Organization: General Motors Company

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 37-38.]

Let me also note that the proposed standards will not be easy; they will be difficult and they will be expensive. The success of our current new offerings in the marketplace like the Chevy Malibu, Equinox, Cruze and the Volt convince us we are on a good path toward meeting these early requirements the proposal will create, but we will need further breakthroughs in technology and good customer acceptance of the additional vehicle changes, technologies and costs that will be associated with providing the vehicles needed in the future years to allow us continued success in meeting the aggressive requirements down the road.

Organization: Gilles, B.

It will hurt the consumer by making vehicles much more expensive. [EPA-HQ-OAR-2010-0799-8065-A1, p. 1]

Organization: Institute for Energy Research (IER)

EPA's cost-benefit analysis for this rule is also fatally flawed. EPA's cost-benefit analysis shows positive net benefits only because EPA omits the cost to consumers of limiting consumer choice. Instead, EPA credits forced fuel savings as a benefit. Because the rule increases the upfront cost of buying a car, the rule forces 7 million drivers out of the car market. This means that 7 million people will not be able to enjoy the fuel savings calculated by EPA because they will not be able to afford a car in the first place. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 1-2]

As EPA's own discussion indicates, its modeling assumes that the current market for fuel economy is incredibly inefficient, with consumers and businesses making massive, systematic errors in their behavior over the course of decades. If, in reality, households and businesses are not as shortsighted as the EPA analysis assumes—perhaps because the EPA modeling leaves out one or more important factors that matter to vehicle buyers in the real world—then the EPA's cost-benefit analysis collapses. [EPA-HQ-OAR-2010-0799-9573-A1, p. 9]

1. EPA Assumes That in Absence of Fuel Economy Regulations, Vehicle Buyers Would Ignore Hundreds of Billions of Dollars in Potential Gains [EPA-HQ-OAR-2010-0799-9573-A1, p. 9]

In standard economic models, it is assumed that households rationally act in their interest, and spend their incomes in ways that maximize utility. It is not that economists literally believe each consumer is a robot capable of performing complex calculus problems with each item in the grocery store, but instead economists believe that rationality is a safe benchmark assumption. This is because the forces of competition, learning from the examples of others, and the ubiquity of product ratings and other information will tend to limit systematic errors on the part of consumers, especially for expensive, recurring purchases and in markets that have many customers. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 9-10]

To be sure, standard economic theory allows a role for government intervention in the case of "negative externalities," which can include greenhouse gas emissions. In this case, although motorists (for example) would presumably make vehicle purchases that tended to equate marginal private benefits with marginal private costs, nonetheless their behavior would be suboptimal since each vehicle buyer would ignore the social costs of his or her behavior. In this setting, the typical economic textbook might recommend a carbon tax or a cap-and-trade framework to force consumers to "internalize the externality" and to once again have their private incentives aligned with social welfare. [EPA-HQ-OAR-2010-0799-9573-A1, p. 10]

To be clear, the above analysis is typical in standard economic theory, but this is not how EPA approaches the cost-benefit assessment of the proposed rule. Instead, EPA assumes that the new rule will benefit vehicle buyers even considering only their narrow self-interest, and then on top of these net private benefits, EPA adds the social benefits of reduced greenhouse gas emissions. In other words, EPA attempts to justify the new rule not simply on the grounds that individual consumers are ignorant of how their behavior will affect global temperatures in the year 2100, but EPA also assumes that consumers are ignorant of how their behavior will affect their gasoline purchases next year. [EPA-HQ-OAR-2010-0799-9573-A1, p. 10]

EPA recognizes the problem:

For this proposed rule, EPA projects significant private gains to consumers in three major areas: (1) Reductions in spending on fuel, (2) for gasoline-fueled vehicles, for time saved due to less refueling, and (3) additional driving that results from the rebound effect. In combination, these private benefits, mostly from fuel savings, appear to outweigh the costs of the standards, even without accounting for externalities. [EPA-HQ-OAR-2010-0799-9573-A1, p. 10]

Admittedly, these findings pose an economic conundrum….If our analysis projects net private benefits that consumers have not realized…then, [assuming efficient markets], there must be additional costs of these private net benefits that are not accounted for [in the EPA analysis]….The estimate of large private net benefits from this rule, then, suggests either that the assumptions [of efficient markets and rational consumers] do not hold, or that EPA's analysis has missed some factor(s) tied to improved fuel economy that reduce(s) consumer welfare. [Bold added.] [EPA-HQ-OAR-2010-0799-9573-A1, p. 11]

To see just how important EPA's assumption of consumer error is to its overall cost-benefit results, consider the following table: [See table on p. 11 of Docket number EPA-HQ-OAR-2010-0799-9573-A1]

The above table shows the breakdown of the aggregate net benefits figures quoted earlier. For example, if we assume a discount rate of 7% and take the lowest estimate of the SCC that EPA uses, then the cost of the proposed rule (through 2050) has an estimated present value of $243 billion, in the form of higher vehicle costs passed on to the purchaser. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 11-12]

However, this gross cost is offset by (a) fuel savings of $579 billion and (b) other benefits (including avoided climate-change damages) of $124 billion. On net, therefore, the high discount rate and low SCC yield benefits of ($579 billion + $124 billion) - $243 billion = $460 billion. Similar calculations show that if we assume a low discount rate of 3%, and a high SCC, then the net benefits rise to $1.72 trillion. [EPA-HQ-OAR-2010-0799-9573-A1, p. 12]

IER has added the row entitled "Implicit Assumed Consumer Error." These values are the difference between the fuel savings and the assumed technology cost (i.e. higher vehicle price, holding all else constant except for fuel efficiency) for each time period. For example, in the year 2040 EPA assumes consumers will suffer $39.8 billion in the form of higher vehicle prices. However, consumers will benefit from saving $144 billion in fuel expenditures. This means that looking solely at private costs and benefits, in the year 2040 the rule will ostensibly provide net benefits to consumers of $104.2 billion. [EPA-HQ-OAR-2010-0799-9573-A1, p. 12]

This is quite a large error to attribute to consumers, and to repeat, this is an annual figure (for the year 2040), and it is reckoned in inflation-adjusted 2009 dollars. The reader should recall EPA's own admission: Either consumers are going to systemically ignore hundreds of billions of dollars in free money, or the EPA's modeling omits important real-world considerations. In the next subsection this comment will explore what these considerations might be. [EPA-HQ-OAR-2010-0799-9573-A1, p. 12]

Before doing so, it should be reiterated just how significant this assumption of consumer irrationality is to EPA's overall cost-benefit assessment. For the high discount rate, low SCC scenario, the implicit consumer error through 2050 is $336 billion, compared to total net benefits of $460 billion. Thus 73 percent of the total net benefits allegedly accruing from the proposed rules (in this particular scenario) are due to the assumed consumer error. In the scenario assuming a low discount rate and high SCC, the implicit consumer error accounts for 56 percent of the total estimated net benefits. [EPA-HQ-OAR-2010-0799-9573-A1, p. 12]

In other words, if it turns out that EPA is indeed omitting important factor(s) from its modeling—such that consumers wouldn't systematically miss out on hundreds of billions of dollars over the course of decades if the government doesn't force them to reap this free money—then EPA's claimed net benefits from the proposed rules would fall by roughly one-half to three-fourths, depending on the other parameter values. [EPA-HQ-OAR-2010-0799-9573-A1, p. 12]

As explained in the previous subsection, EPA's analysis rests on the assumption that consumers are irrationally unwilling to pay a higher price for "the same" vehicle that is equal in all respects to another, cheaper vehicle, except for superior fuel economy. This behavior is assumed true even when the present value of lifetime savings on fuel expenditures would more than compensate for the higher initial purchase price, leading to the term "energy paradox" in the literature. The EPA discussion relates some of the theories in the literature to explain this "conundrum," such as consumers incorrectly calculating the fuel savings from differences in mpg ratings, consumers using rules of thumb when making purchases rather than optimizing calculations, etc. [EPA-HQ-OAR-2010-0799-9573-A1, p. 13]

The problem with these ad hoc explanations is that they ignore the tremendous profit opportunities such massive consumer irrationality would leave open to enterprising firms. For example, even if one were to believe that individual motorists could make gross computational errors of this magnitude, surely entire taxicab fleets wouldn't be plagued by these simple mistakes. (And yet, in 2011 New York City Mayor Bloomberg sought the power to regulate fuel economy standards for NYC cabs.) Another obvious industry—and one that is more open to competition than taxi fleets—to benefit from this alleged inefficiency is the rental car market. It might take some ingenuity to implement, but if the EPA's analysis is correct, then a rental car company could presumably profit by buying only vehicles with very high fuel-efficiency, and coming up with various methods for capturing the savings this would allow for its customers. (For example, it would be fairly easy to estimate the dollar savings in fuel for a given trip that would last only a few days—as opposed to estimating the lifetime fuel savings when buying a new car.) The fact that rental car agencies currently don't consist entirely of the highest fuel-efficient models is yet more evidence that EPA's modeling leaves out important factors. [EPA-HQ-OAR-2010-0799-9573-A1, p. 13]

Consider the following table produced from data from U.S. Department of Energy and EPA. In every case, the 2010 version of each car is larger, has a larger engine, has more passenger volume, and more luggage volume. The fuel economy is similar with the 2010 version generally getting slightly worse city fuel economy and slightly better highway fuel economy. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 13-14]

Consumers demand a certain fuel economy, but consumers also want to maximize other attributes such as performance and size (then again, maybe the fuel economy of these cars is actually higher than consumers' actual preferences because of CAFE standards). If consumers really demanded very fuel efficient cars, Honda would still make a car today that gets better gas mileage than the 1985 Honda Civic Coupe HF. The Civic Coupe HF got nearly 50 mpg on the highway a quarter century ago. Today, the Honda's most fuel efficient car is a hybrid sedan Civic that gets 44 mpg in the city and 44 mpg on the highway. The better explanation for this outcome is that consumers have preferences for a variety of attributes that the EPA analysis omits, not that consumer irrationality increased over the last 25 years. [EPA-HQ-OAR-2010-0799-9573-A1, p. 14]

Besides the possibility of other factors entering into the consideration, another explanation for the ostensible "irrationality" of consumers is that they treat the uncertainty of the future differently from how the EPA's modeling approach requires. When evaluating the present monetary value of improvements in fuel efficiency, two of the most important considerations are future interest rates and the price of gasoline. These are highly volatile, and consumers quite rationally may not place much weight on expected savings from fuel economy occurring several years in the future. [EPA-HQ-OAR-2010-0799-9573-A1, p. 16]

In other words, consumers may rationally have much higher discount rates than EPA assumes they should have. Consider this research presented by economist Ronald J. Sutherland in the context of a previous NHTSA rulemaking: [EPA-HQ-OAR-2010-0799-9573-A1, p. 16]

Corporations frequently require high hurdle rates in excess of 12 percent to undertake capital investments. Dixit and Pindyck present a compelling analysis of observed high discount rates for irreversible investments. The technical literature indicates that irreversible investments may require hurdle rates two to four times the average discount rate in order to trigger an investment. However, fuel economy standards have the unattractive investment properties of being irreversible, whereas common stocks are highly liquid. Metcalf and Rosenthal and Hassett and Metcalf explain how this irreversibility property warrants discount rates of at least two or three times higher than may be expected. Allowing for the irreversibility property of such investments, a required rate of return of at least 20% appears reasonable for high-income households. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 16-17]

Energy saving investments are typically irreversible investments and therefore require an even higher premium. The proposed fuel economy standards for light trucks are irreversible investments. The investment in fuel economy is a sunk cost at time of purchase. The investment cannot be reversed, should the consumer decide that the investment is unwarranted. Hassett and Metcalf apply the irreversible investment model to investments in energy conservation and conclude that an appropriate hurdle rate would be about four times greater than the standard discount rate. Metcalf and Rosenthal reach a similar conclusion in applying the model to commercial lighting and to energy efficient refrigerators. If the government imposed discount rate of 7 percent is considered standard, an appropriate discount rate for the fuel economy benefits would be at least 14 percent, but probably closer to 21 percent or event 28 percent. [EPA-HQ-OAR-2010-0799-9573-A1, p. 17]

The application of higher hurdle rates indicates that the benefits from fuel economy standards should be revised downward. The NHSTA study calculates consumer benefits as the present value of future energy saving using a 7 percent discount rate. However, the evidence on discount rates, as well as revealed consumer preferences, indicates that an appropriate discount rate is at least 2 or 3 times higher that [sic] the government imposed rate. [EPA-HQ-OAR-2010-0799-9573-A1, p. 17]

Consumers may not act as EPA assumes they should act, but that is no proof that consumers act against their rational economic self-interest. Consumers may be maximizing other dimensions that EPA is not considering. [EPA-HQ-OAR-2010-0799-9573-A1, p. 17]Responding to this argument in the past, EPA has argued that we are suggesting that “there must be a loss associated with improving fuel economy, because many consumers do not purchase highly fuel-efficient vehicles already on the market.” Furthermore, EPA states: [EPA-HQ-OAR-2010-0799-9573-A1, p. 17]

OMB Circular A-4 notes that “Economists ordinarily consider market prices as the most accurate measure of the marginal value of goods and services to society.” The fuel savings that consumers will receive are directly measurable using market prices for fuel, while the values that consumers reveal through their purchase decisions are indirect measures and may therefore be less reliable. [EPA-HQ-OAR-2010-0799-9573-A1, p. 18]

EPA, along with most commenters on the rule, finds that there are cost-effective fuel savings that the market has not at this time provided to consumers and includes those benefits in our analysis. [EPA-HQ-OAR-2010-0799-9573-A1, p. 18]

In other words, EPA is ignoring (or at least heavily discounting) people’s actual purchase decisions and only considering what EPA can measure—fuel consumption. This same logic is contained in this proposed rule. Just because people may value safety, power, four wheel drive, comfort, convenience, size, more than fuel economy does not mean EPA can discount those choices. It is not necessarily irrational to value other characteristics more than fuel savings as EPA assumes. [EPA-HQ-OAR-2010-0799-9573-A1, p. 18]

The EPA’s logic can be turned on its head, to show the problem with its approach. Currently, it is unprofitable for manufacturers to produce vehicles with the specific combination of attributes that would satisfy the proposed mileage standard. That means the amount consumers would be willing to pay for these compliant vehicles is less than the market value of the resources that would be required to produce them; that’s what it means to say their production is currently unprofitable. Thus EPA’s own criterion shows that its rule would force vehicle manufacturers to devote scarce resources into channels that are less valuable than other potential outlets. [EPA-HQ-OAR-2010-0799-9573-A1, p. 18]

3. Models which purport to show consumers do not act in their rational economic self-interest are crude at best [EPA-HQ-OAR-2010-0799-9573-A1, p. 18]

To reiterate, the EPA cost-benefit analysis relies on a particular theory of consumer behavior—namely that it is prone to extreme error in the context of vehicle fuel economy. In the literature modeling consumer behavior, the estimated valuations of fuel economy vary by an order of magnitude, suggesting that the econometricians do not understand this issue very well. In practice, there are no “controlled experiments” where consumers are offered the choice between two otherwise identical vehicles, where one is more expensive yet has better fuel economy. On the contrary, in the real world there are tradeoffs between vehicles that simultaneously differ on vehicle size, acceleration, price, safety, and finally fuel economy. More recent modeling has done a better job capturing these nuances, but economists have still not reached a consensus on exactly what motivates consumers when making vehicle purchases. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 18-19]

To give a concrete example of the problem, the EPA's discussion of the "energy paradox" acknowledges that consumers in practice do not always have a full spectrum of vehicle attributes varying in each dimension, and then says in a footnote: "For instance, in [model year] 2010, the range of fuel economy (combined city and highway) available among all listed 6- cylinder minivans was 18 to 20 miles per gallon. With a manual transmission, 4-cylinder minivan, it is possible to get 24 mpg." [EPA-HQ-OAR-2010-0799-9573-A1, p. 19]

The EPA discussion is here trying to explain why the energy paradox persists; in EPA's view, the market for some inexplicable reason isn't offering minivans getting 24 mpg, and so consumers have no choice but to buy the less fuel efficient models, even though the savings in price is swamped by the long-run fuel expenditures that these cheaper minivans will require. [EPA-HQ-OAR-2010-0799-9573-A1, p. 19]

But the EPA discussion fails to ask: Why did the market for minivans concentrate on automatic transmission, 6-cyclinder models that only got 18 to 20 mpg? After all, car companies in the past offered manual transmissions in their station wagons and vans. So why are car companies not offering manual transmissions in their minivans now? Could it be that many of the households in the market for a new minivan weren't interested in an option that would require using the clutch while taking the kids to soccer games and other activities throughout the week in stop-and-go driving? In the EPA's crude modeling, if these households had instead been forced to buy a more expensive, 4-cylinder minivan with a stick shift, EPA's rule would be doing them a favor in the long run. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 19-20]

4. A one-size-fits-all regulatory policy is not the answer for people with heterogeneous tastes and preferences

As another specific example of the true subtleties involved—which are ignored by simplistic models—we must remember that a typical suburban family might purchase a "gas guzzling" SUV in order to make large grocery runs, pick up furniture, pull a boat, etc., while it also purchases a fuel efficient car for other travel. Depending on future movements in gasoline prices, the family can then adjust its driving accordingly, using the SUV more when gasoline is cheap, while relying more heavily on the hybrid when gasoline prices are relatively high. The typical model looking for "the" consumer valuation of fuel economy currently does not capture the flexibility and needs of actual motorists. By imposing a one-size-fits-all decision that raises fuel economy (while hurting other attributes) across the board, the government would be taking away options from families and making them worse off. [EPA-HQ-OAR-2010-0799-9573-A1, p. 20]

Another problem with the entire approach is to assume that consumers have identical tastes regarding fuel economy. In reality, some consumers may be very concerned, while others may not be. Thus even if the proposed rule made the "representative consumer" better off, in practice it would still harm those consumers who (for whatever reason) do not place a high subjective value on fuel economy. [EPA-HQ-OAR-2010-0799-9573-A1, p. 20]

As a final example showing the problem in the EPA's assumption of a typical vehicle buyer, consider that the proposed rule increases the upfront cost of buying a car, and thereby forces an estimated 7 million drivers out of the car market. This means that 7 million people will not be able to enjoy the fuel savings calculated by EPA because they will not be able to afford a car in the first place. Thus the alleged fuel economy benefits to vehicle buyers who are still able to afford their purchase must be weighed against the psychic losses to those who now must postpone or abandon their purchases altogether. Aggregating subjective preferences together to achieve a single number of "net benefits" is a very controversial area of economic theory, though EPA hardly discusses the issue. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 20-21]

EPA's cost-benefit analysis shows positive net benefits only because EPA omits the cost to consumers of limiting consumer choice. [EPA-HQ-OAR-2010-0799-9573-A1, p. 23]

Organization: Institute for Policy Integrity, New York University School of Law

The agencies constant performance cost projections are likely to be an overestimate of the risk of lost consumer welfare. Since attributes like size and performance are at least partly relative, changing the fleet-wide average size or performance may not significantly impact overall consumer welfare. Manufacturers may not have to spend as much as the agencies' assume in order to prevent any aggregate consumer welfare loss. Similarly, any risk of lost consumer welfare unaccounted for in the agencies' constant performance cost projections is mitigated by the positionality of attributes. [EPA-HQ-OAR-2010-0799-9480-A1, p. 2]

The agencies should consider how positionality and the bandwagon effect will shape the consumer market for new technologies. As fuel-efficient vehicles become more visible and more common, the perceived attractiveness of fuel efficiency may increase. Information diffusion and habit formation will also affect the future of the market for electric vehicles and other new technologies. [EPA-HQ-OAR-2010-0799-9480-A1, p. 2]

Constant Performance Cost Projections Likely Overestimate the Risk of Lost Consumer Welfare, and the Agencies Should Treat Them as an Upper Bound

The agencies build an assumption of constant performance into their compliance cost estimates. They believe that manufacturers will spend whatever extra it costs to maintain current vehicle attributes as they increase fuel economy, in order to preserve consumer welfare. The cost projections therefore depend on the agencies' best guesses about how changed attributes would impact consumer preferences and welfare. As the agencies note, "[b]ecause welfare losses are monetary estimates of how much consumers would have to be compensated to be made as well as in the absence of the change, the price increase measures the loss to the buyer." [EPA-HQ-OAR-2010-0799-9480-A1, p. 15]

As a result, if the agencies are wrong about how changing attributes would impact consumer preferences, then they are overestimating how much manufacturers will need to spend to maintain consumer welfare. The agencies acknowledge that their cost estimate is likely to be an overestimate: [EPA-HQ-OAR-2010-0799-9480-A1, p. 15] because the consumer has choices other than buying the same vehicle with a higher price; she could choose a different vehicle, or decide not to buy a new vehicle. The consumer would choose one of those options only if the alternative involves less loss than paying the higher price. Thus, the increase in price that the consumer faces would be the upper bound of loss of consumer welfare, unless there are other changes to the vehicle due to the fuel economy improvements that make the vehicle less desirable to consumers."98 [EPA-HQ-OAR-2010-0799-9480-A1, pp. 15-16]

Positional goods theory reinforces the conclusion that the agencies' cost estimate is an upper bound and is likely an overestimate. 99 The value of a "positional good" depends on how it compares with similar goods possessed by others.100 The owner of a positional good derives more welfare from that good than expected when considering only its functional qualities. The prominent explanation for this phenomenon is that highly visible consumption becomes a signal for status,101 and people value status because they anticipate it will translate into more favorable treatment in economic and social interactions.102 For example, jewelry, silk ties, and expensive champagne all have very little functional value, but their consumption is conspicuous and conveys status to others. [EPA-HQ-OAR-2010-0799-9480-A1, p. 16]

Other goods, like cars, have both functional and positional value. Consumers may partially value vehicle size and horsepower for their functional utility like hauling capacity and speed, but a growing body of research indicates that many consumers do not necessarily want the biggest and fastest car, so long as their car is bigger and faster than their friends' and neighbors'. According to a recent U.S. survey on the visibility of 31 expenditure categories (from food to mobile phones), new or used motor vehicle purchases were the second most visible expenditure; related expenditures on gasoline/diesel, vehicle maintenance, and insurance were all substantially less visible. 103 Surveys also consistently confirm that cars are highly positional goods, that people prefer a relative increase in a car's value to an absolute increase,104 and that the more visible features of cars are more positional.105 Financial savings, in contrast, are typically considered non-positional.106 [EPA-HQ-OAR-2010-0799-9480-A1, p. 16]

The more observable prestige features of vehicles include newness, brand, size, design, and power. While all these traits have functional value (such as capacity, safety, and performance),107 they also all have relative value: consumers value power not just for speed but for the status signal and for the ability to out-accelerate others at a traffic light; consumers do not necessarily want a big car, but they do want a bigger car.108 As Bob Lutz, Vice Chairman of General Motors, has stated, "aspirational aspects overwhelm the functional differences" when customers choose cars.109 Importantly, many vehicle prestige features—especially larger size and increased performance—reduce fuel economy.110And given the low visibility of gasoline expenditures and of financial savings, fuel efficiency itself is currently a relatively non-positional good (though there is some chance that the agencies' new vehicle labeling requirements could start to make fuel economy more visible and positional). [EPA-HQ-OAR-2010-0799-9480-A1, p. 17]

A vehicle's size and weight are also positional for safety reasons, in addition to status motivations. To the extent smaller cars fare worse in crashes with bigger cars, consumers may value bigger cars not because of any intrinsic safety value, but because of the average fleet size.

According to Wenzel's research on the relationship between vehicle weight/size and safety, while an increase in footprint decreases the risk of casualty to the driver, an increase in footprint—especially for pick-up trucks and sports cars—raises the risk of both fatality and casualty to other drivers. 111 [EPA-HQ-OAR-2010-0799-9480-A1, p. 17]

The trouble with positional goods is they impose externalities. This is obvious in the safety context: if Joan upgrades from her compact car to a large pick-up truck, she may feel somewhat safer, but her purchase marginally increases the risk to all other drivers. It also applies in the status context. Again, if Joan buys a big, fast, flashy car to move up the status hierarchy, John's big, fast, flashy car is no longer as rare. John feels relatively worse off and so will have to invest in an even bigger, faster, flashier car just to restore his previous status position. As a result, both consumers spend resources without actually improving their relative status. [EPA-HQ-OAR-2010-0799-9480-A1, p. 17]

Because vehicle purchase decisions are made non-cooperatively but in fact alter the spending behavior and relative safety of others, consumers get stuck on a "positional treadmill" that does not increase welfare.112 Yet if any individual opts out of this "expenditure arms race," it would only move that consumer backwards on the status or safety hierarchy, which for most consumers is unacceptable.113 And given limited resources and limited market options, the over-consumption of positional goods results in under-consumption of non-positional goods (such as fuel efficiency). If consumers could maintain their relative economic position, they might be more willing to pay for non-positional goods.114 [EPA-HQ-OAR-2010-0799-9480-A1, pp. 17-18]

Fuel economy regulation, therefore, is a cooperative solution that allows consumers to achieve what they could not in the non-cooperative open market: namely, an increase in fuel economy without losing position in the status hierarchy.115 Regulations similarly help consumers select fuel economy without falling behind in the safety/size rankings, since with time the average fleet size will shift.116 [EPA-HQ-OAR-2010-0799-9480-A1, p. 18]

In other words, positional goods theory explains that consumer valuations of vehicle attributes like size and performance are relative, which means consumer preferences can adjust as average fleet-wide attributes shift. As a result, changing the fleet-wide average size or performance may not significantly impact overall consumer welfare. In the context of the agencies' cost estimates, this means that manufacturers may not have to spend as much as the agencies' assume in order to prevent any aggregate consumer welfare loss. Consequently, the agencies' constant performance cost projects likely overestimate the actual cost of the regulation. [EPA-HQ-OAR-2010-0799-9480-A1, p. 18]

To improve the accuracy of their cost estimates, the agencies should reanalyze their assumption that "changes in vehicle attributes can significantly affect the overall utility that vehicles offer to potential buyers," in light of positional goods theory. A better understanding of the positionality of cars will help the agencies refine their projections for how much manufacturers will need to spend to maintain actual consumer welfare. Even if a more accurate cost estimate is unlikely to change the stringency or structure of the proposed rule,118 refining the cost estimate remains important. Not only is an accurate cost-benefit analysis based on the best available evidence required by professional and legal norms,119 but a better cost estimate will enhance confidence in justifications for the rule, will improve the public debate over fuel economy, and will set a valuable precedent for future rulemakings.120 [EPA-HQ-OAR-2010-0799-9480-A1, pp. 18-19]

Any Risk of Lost Consumer Welfare Unaccounted for in the Agencies' Constant Performance Cost Projections Is Mitigated by the Positionality of Attributes

Despite the constant performance price projection model, the agencies worry that "if estimates do not include adequate allowances to prevent attribute sacrifices, technological costs will underestimate true economic costs." The agencies acknowledge that, even with footprint-based standards and a constant performance approach, the proposed rule could cause manufacturers to forego future planned attribute improvements or even, "[i]n extreme cases," to change current attributes.122 NHTSA conducted a sensitivity analysis to test this possibility, and found that even if lost consumer welfare equaled 50% of total private benefits, the rule would still be cost-benefit justified.123 [EPA-HQ-OAR-2010-0799-9480-A1, p. 19]

Nevertheless, for use in the final rulemaking, NHTSA is developing a fuller model of buyers' decisions to estimate explicitly any welfare changes that could result from the combination of price increases, fuel economy increases, and altered vehicle attributes.124 NHTSA should be sure to build the lessons from positional goods theory into its model, and the agencies should use the positionality of vehicle attributes and explain why their cost estimates are not likely to underestimate consumer welfare losses; in fact, to the contrary, position goods theory would predict that the cost projections are more likely to be overestimates. [EPA-HQ-OAR-2010-0799-9480-A1, p. 19]

Positionality and the Bandwagon Effect Will Shape the Consumer Market for New Technology

The agencies ask for comment on factors that may affect the consumer market for electric vehicles and other advanced technologies. In conducting this analysis, the agencies should consider the malleability of consumer preferences and valuations for new technologies. [EPA-HQ-OAR-2010-0799-9480-A1, p. 19]

If fuel efficiency becomes a sufficiently visibility trait (perhaps as a result of the vehicle labeling rule, marketing campaigns, and related efforts), it is possible that consumers could start competing for the highest fuel efficiency. But even if that does not happen, consumers' valuation of fuel efficiency will undoubtedly change over time and as a result of the proposed regulation.126 [EPA-HQ-OAR-2010-0799-9480-A1, p. 19]

The bandwagon effect occurs when the perceived attractiveness of a good increases as more people consume it. Growing empirical evidence suggests an environmental bandwagon: people are more likely to make environmental choices when they think everyone else is doing the same.127 [EPA-HQ-OAR-2010-0799-9480-A1, p. 19]

The separate though conceptually related effects of information diffusion and habit formation might also affect the market for more fuel-efficient vehicles. Car choices are strongly influenced by the purchases of peers, 128 perhaps because consumers often deal with the need to justify their choices by deferring to the preferences of others.129 Consumers might currently have a negative opinion of vehicles running on unknown technology or of unknown model types;130 but once more fuel-efficient vehicles increase market share and become more familiar to consumers as a result of the proposed regulations, new consumer habits will form, and willingness to pay for fuel efficiency might increase. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 19-20]

The agencies should treat their constant performance cost projections as an overestimate of the risk of lost consumer welfare. Positional goods theory explains that vehicle attributes like size, power, and safety have relative value. Since attributes like size and performance are at least partly relative, changing the fleet-wide average size or performance may not significantly impact overall consumer welfare. Manufacturers may not have to spend as much as the agencies' assume in order to prevent any aggregate consumer welfare loss. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 20-21]

The agencies should consider how positionality and the bandwagon effect will shape the consumer market for new technologies. As fuel-efficient vehicles become more visible and more common, the perceived attractiveness of fuel efficiency may increase. Information diffusion and habit formation will also affect the future of the market for electric vehicles and other new technologies. [EPA-HQ-OAR-2010-0799-9480-A1, p. 21]

---

98 Id. at fn. 525 (emphasis added).

99 See attached symposium paper on positional goods for additional details.

100 Robert H. Frank, The Demand for Unobservable and Other Nonpositional Goods, 75 AM. ECON. REV. 101, 101 (1985).

101 Id. at 107 ("When an individual's ability level cannot be observed directly, such observable components of his consumption bundle constitute a signal to others about his total income level, and on average, therefore, about his level of ability. . . . [I]mperfect information about ability might create incentives for people to rearrange consumption patterns to favor observable goods."). Consumption patterns might vary depending on the relevant population in the status competition. People might compete among friends, neighbors, and coworkers; within their socio-economic class; with higher classes; or on a society-wide basis. See Fredrik Carlsson et al., Do You Enjoy Having More than Others? Survey Evidence of Positional Goods, 74 ECONOMICA 586, 590 (2007). If a particular population has more reliable, independent information on abilities or income, consumption patterns for observable goods might shift. Frank, supra note 100, at 108.

102 Y. Weiss & C. Fershtman, Social Status and Economic Performance: A Survey, 42 EURO. ECON. REV 801, 802 (1998). Status can be instrumental, in that higher status can carry better consumption opportunities, access to better employment, and even better marriage prospects. Ed Hopkins & Tatiana Kornienko, Running to Keep in the Same Place: Consumer Choice as a

Game of Status, 94 AM. ECON. REV. 1085, 1087 (2004). Factors like psychology, biological hardwiring, and envy also should not be ignored.

103 Ori Heffetz, A Test of Conspicuous Consumption: Visibility and Income Elasticities, 93 REV. OF ECON. & STAT. 1101, 1106 (2011) (vehicle purchase had a visibility index of 0.73, second only to tobacco products (0.76); gasoline/diesel had a visibility index of 0.39, car repairs were at 0.42, and car insurance fell near the bottom at 0.23).

104 Specifically, a majority of people surveyed would prefer a world in which their car is superior to other people's but less valuable overall, versus a world in which their car has more absolute value but is inferior to the societal average. See, e.g., Carlsson et al., supra note 101, at 588, 593 (reporting results of a Swedish survey); Francisco Alpizar et al., How Much Do We Care About Absolute Versus Relative Income and Consumption?, 56 J. OF ECON. BEHAVIOR & ORG. 405, 412 (2005) (reporting results of Costa Rican survey). Though some such surveys were conducted in other countries, if anything positionality for cars could be stronger in the United States, given the American affinity for cars and the income distribution. See Reid R. Heffner et al., Effects of Vehicle Image in Gasoline-Hybrid Electric Vehicles 2 (U.C. Davis Inst. of Transportation Studies UCD-ITS-RR-05-08, 2005) ("In the words of automobile psychologist G. Clotaire Rapaille, Americans are in 'a permanent search of an identity' and 'cars are very key . . . [they are] maybe the best way for Americans to express themselves.'"); Hopkins & Kornienko, supra note 102 (noting that positional effects increase as society's income increases, because the portion of income spent on conspicuous consumption increases). On the other hand, cars are often more a necessity and less a luxury in the United States than in other countries. See Mark Grinblatt et al., Interpersonal Effects in Consumption: Evidence from the Automobile Purchases of Neighbors (Yale ICF Working Paper No. 04-10, 2004).

105 Carlsson et al., supra note 101, at 588, 593 (finding support for hypothesis that 'visible goods and their characteristics, such as the value of cars, are more positional than less visible goods and their characteristics, such as car safety.').

106 See, e.g. Omer Moav & Zvika Neeman, Savings Rates and Poverty: The Role of Conspicuous Consumption and Human Capital (2009), available at http://www.hecer.fi/Seminars/Papers/moav_paper.pdf.

107 Carlsson et al., supra note 101, at 595, could not provide a clear answer to the question of whether cars are completely positional. On average cars are highly positional, but that reflects a good deal of heterogeneity: cars may be completely positional for some people, but are possibly completely non-positional for others. Id. at 596.

108 Erik Verhoef & Bert van Wee, Car Ownership and Status: Implications for Fuel Efficiency Policies from the Viewpoint of Theories of Happiness and Welfare Economics 4 (Tinbergen Institute Discussion Paper TI 2000-076/3, 2000) ('However, most cars in most Western countries have engines with much more power than needed, given the characteristics of infrastructure, speed limits, and travel distances.').

109 George Will, Americans and Their Cars, TOWNHALL DAILY, Apr. 18, 2002, available at http://townhall.com/columnists/GeorgeWill/2002/04/18/americans_and_their_cars.

110 See Knittel, supra note 84.

111 Wenzel, supra note 85, at 19, 36. Effect of footprint on fatality risk to driver: P-value 0.215, R2 value 0.01. Effect of footprint on fatality risk to other drivers: P-value <0.001, R2 value 0.38 (though the data for trucks drives this relationship much more than for cars). Effect of footprint on casualty risk to driver: P-value <0.001, R2 value 0.26. Effect of footprint on casualty risk to other drivers: P-value <0.001, R2 value 0.26 (though again the data for trucks drives this relationship much more than for cars).

112 Robert H. Frank, Positional Externalities Cause Large and Preventable Welfare Losses, 95 AM. ECON. REV. 137, 137 (2005).

113 Frank, supra note 100, at 105-06.

114 Robert H. Frank & Cass R. Sunstein, Cost-Benefit Analysis and Relative Position, 68 UNIV. OF CHICAGO LAW REV. 323, 326 (2001) ("If people could maintain their relative economic position, they would be willing to pay more, and possibly a great deal more, to purchase many of the goods that regulation attempts to deliver. . . .[W]hen an individual buys additional safety in isolation, he experiences not only an absolute decline in the amounts of other goods and services he can buy, but also a decline in his relative living standards. In contrast, when a regulation requires all workers to purchase additional safety, each worker gives up the same amount of other goods, so no worker experiences a decline in relative living standards. If relative living standards matter, then an individual will value an across-the-board increase in safety more highly than an increase in safety that he alone purchases.").

115 Correcting for negative externalities and collective action problems is a classic case for regulation. "Analytically, positional externalities are no different from ordinary environmental pollutants." Id. at 364. Such regulation is not about taking public action just because one consumer's increased consumption makes another consumer unhappy or envious; rather, regulation is justified to address a market failure. Id. at 365. Even if not everyone wants to solve this particular collective action problem, "we do not require unanimity as a precondition for unquestionably legitimate collective action in other spheres." Id. at 366. See also Verhoef & van Wee, supra note 91, at 13-14. ("On the free market, consumers would inefficiently strongly stimulate each other to purchase more luxurious variants. Corrective taxes [or a CAFE standard with tradable permits] may protect consumers against such treadmills.").

116 Regulations also correct a supply-side problem, since theory predicts manufacturers will devote their research and development budget to status goods until government adjusts the incentives. Ben Cooper et al., Status Effects and Negative Utility Growth, 111 ECON. J. 642 (2001).

118 See supra note 63, and accompanying text.

119 See supra note 62, and accompanying text.

120 See supra notes 65-67, and accompanying text.

122 See NHTSA, PRIA, supra note 69, at 708.

123 Id. at 719.

126 Heffner et al., supra note 104, at 3 ("As more hybrid models enter the market, the meanings of HEVs are likely to evolve.").

127 For example, when hotel guests are told they should "join their fellow citizens" in saving water by reusing towels, reuse rates increase by 34%; similarly, when electric bills present a comparison of neighborhood consumptions, usage decreases by 2%. See Hunt Allcott & Sendhil Mullainathan, Behavior and Energy Policy, 327 SCI. 1204 (2010); Hunt Allcott, Social Norms and Energy Conservation, 95 J. PUB. ECON. 1082 (2011).

128 Grinblatt et al., supra note 104 (reporting results of study in Finland that found car purchases strongly influenced by purchases of neighbors, most likely because of information sharing).

129 James Bettman et al., Constructive Consumer Choice Processes, 25 J. CONSUMER RES. 3 (1998).

130 Eugenio Miravete & Maria Moral, Qualitative Effects of Cash-For-Clunkers Programs (2009), available at http://www.eugeniomiravete.com/papers/EJM-MJM-Clunkers.pdf.

Organization: International Council on Clean Transportation (ICCT)

The agencies may be confused by studies that rely on standard economic theory, which says that assuming full information and no uncertainty, consumers will make optimal tradeoffs between the purchase price and subsequent operating costs. However, the standard economic theory does not apply in this case because mainstream consumers undervalue fuel savings due to uncertainty and loss-aversion. [EPA-HQ-OAR-2010-0799-9512-A1, p. 15]

There is substantial circumstantial evidence that most consumers in the U.S. place a low value on fuel economy. For example, Turrentine and Kurani18 conducted an in depth survey of the car-buying histories of 57 California households. None of these 57 households made any kind of quantitative assessment of the value of fuel savings and only 9 stated they compared the fuel economy of vehicles in making their choice. The selected consumers were largely unaware of their annual fuel cost, in contrast to general knowledge of the daily price fluctuations of a gallon of gasoline. Turrentine and Kurani concluded that: 'When consumers buy a vehicle, they have neither the tools nor the motivation nor the basic building blocks of knowledge to make a calculated decision about fuel costs.' [EPA-HQ-OAR-2010-0799-9512-A1, p. 15]

The question that has been debated for decades is simply - why? This is an extremely important question, as most of the calculation of consumer welfare is based on the answer. If consumers are already receiving their optimum level of fuel economy, then efficiency standards will decrease their welfare. However, if there are valid reasons why consumers are not making optimal tradeoffs at the time of vehicle purchase, or if the entire question is not being framed properly, then efficiency standards would increase consumer welfare. [EPA-HQ-OAR-2010-0799-9512-A1, p. 16]

ICCT believes uncertainties about the cost and value of fuel economy improvements, combined with general loss-averse behavior by consumers, offers a rational and accurate explanation of the failure of the market to optimize fuel cost savings. Green 201019 found that using reasonable estimates of the uncertainty offing-use fuel economy, future fuel prices, annual vehicle use, vehicle lifetime, and incremental vehicle price yielded an average customer payback period of roughly 3 years. While economists refer to this as a market failure, given the large uncertainties in the actual amount of future fuel cost savings and the other ways that consumers can spend their money, the typically loss-averse customer is being quite rational in only wanting to pay for 2-5 years of projected fuel savings. [EPA-HQ-OAR-2010-0799-9512-A1, p. 16]

If consumers only value 2-5 years of fuel savings, does this mean their consumer welfare will decrease if standards force them to save money on fuel from technologies that achieve a fuel-savings based payback in more than 2-5 years? Greene's paper also addressed this issue and found there are two important issues that invalidate this conclusion: [EPA-HQ-OAR-2010-0799-9512-A1, p. 16]

(1) Standards change the status quo by removing the option to buy a vehicle without the additional efficiency technology - it is not presented to the customer at all. Loss aversion is context dependent, which leads to the paradox that consumers who would decline a risky bet may reach a higher level of utility if forced to accept the bet. Efficiency standards mandate that only vehicles with additional efficiency technology can be sold. There is no reason why consumers should evaluate the choice limited by standards in the same way they perceive the choice without standards. ICCT believes the only valid reference point for loss aversion is the updated status quo that exists when the consumer actually makes the purchase decision. [EPA-HQ-OAR-2010-0799-9512-A1, p. 16]

(2) Standards require everyone to purchase higher levels of efficiency technology, not just individual customers, leading to indirect consumer welfare benefits. The concept of consumer welfare under standard economic theory is based upon individual choices. However, efficiency standards affect everyone, not just individual customers. The individual's welfare is now the sum of the direct impact on the individual and the indirect benefit to the individual of forcing other customers to buy more efficient vehicles. There are substantial benefits to an individual if everyone else buys more efficient vehicles. It reduces demand for oil, which leads to lower fuel prices and reduced energy security risks. It also reduces carbon emissions and slows down global warming. Most people are aware of these benefits if standards are imposed on everyone and place significant value on them. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 16-17]

18 Turrentine, Thomas S., and Kenneth S. Kurani, 'Car Buyers and Fuel Economy?' Energy Policy 35 (2007): 1213-1223.

19 Greene, David 2010. 'Uncertainty, loss aversion, and markets for energy efficiency', Energy Economics.

6. Mainstream customers severely discount the value of future, highly uncertain fuel savings. The primary purpose of efficiency standards is to make up for this discounting and push technology into the fleet beyond what would have otherwise been demanded by the market. Considering the stringency of the 2011-2016 standards, the sensitivity analysis for market-driven increases in efficiency after 2016 should be removed from the Final Rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

11. The estimates of net benefits should fully value fuel savings over the lifetime of the vehicle. The alternative NHTSA estimates reducing the net benefits are speculative and should be removed from the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

11) Discounting of Consumer Benefits

The NPRM evaluates the costs and benefits of the proposed rule, and concludes that the net benefits to society of the National Program will be in the range of $311 billion to $421 billion (7 and 3 percent discount rates, respectively) over the lifetimes of those vehicles sold in MY 2017-2025. Most of these benefits are attributed to reductions in fuel consumption. [EPA-HQ-OAR-2010-0799-9512-A1, p. 23]

The reference case analysis of benefits includes the value of fuel savings over the entire lifetime of the vehicle. EPA summarizes its rationale for this approach as follows: [EPA-HQ-OAR-2010-0799-9512-A1, p. 23]

EPA continues to value fuel savings from the proposed standards using the projected market value over the vehicles' entire lifetimes, and to report that value among private benefits of the proposed rule. Improved fuel economy will significantly reduce consumer expenditures on fuel, thus benefiting consumers. Real money is being saved and accrued by the initial buyer and subsequent owners. In addition, using a measure based on consumer consideration at the time of vehicle purchase would involve a very wide range of uncertainty, due to the lack of consensus on the value of additional fuel economy in vehicle choice models. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 23-24]

NHTSA's reference case analysis similarly assumes that there is no loss in value to consumers resulting from vehicles that have an increase in price and higher fuel economy. However, NHTSA also performed sensitivity analyses that assumed that there is a 25 percent or 50 percent loss in value to consumers--equivalent to the assumption that consumers will only value the calculated benefits they will achieve at 75, or 50 percent, respectively of the main analysis estimates. This is intended to account for possible unspecified or poorly understood negative impacts of the rule on consumer preferences. [EPA-HQ-OAR-2010-0799-9512-A1, p. 24]

The sensitivity analyses conclude that these alternative assumptions have a large impact on the magnitude of net benefits, reducing the estimated net benefit by 63.0% and 31.5% respectively. Even in the worst case, however, total benefits still exceed costs. [EPA-HQ-OAR-2010-0799-9512-A1, p. 24]

ICCT agrees that estimates of net benefits should fully value fuel savings over the lifetime of the vehicle. As noted by EPA these are real-world impacts that have tangible value. The alternative NHTSA estimates presented in the NPRM are speculative and should not be given any consideration. [EPA-HQ-OAR-2010-0799-9512-A1, p. 24]

Organization: Michigan State Senate, District 18

But increased fuel economy will also save working families already feeling the pinch at the pump. Americans spend approximately $2,000 a year on gasoline, and at this rate the costs quickly add up. In fact, all together Americans spend more than $1.3 billion filling up each day. The proposed 54.5 fuel economy standard will save consumers who buy cars after 2025 up to $6,600 in fuel costs over the life of their vehicle. [EPA-HQ-OAR-2010-0799-5594-A1, p. 1]

And anyone who has filled up their car in the last few years is all too familiar with the price volatility of gas. In 2008, the price of oil stood at $147 a barrel. By 2009, it had dipped to $35 a barrel, but in 2011 it once again climbed to $120 per barrel. Greater fuel economy will insulate consumers and businesses from this constant rollercoaster and save us all money at the pump. [EPA-HQ-OAR-2010-0799-5594-A1, p. 1]

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 34.]

Buffering against gasoline price volatility for consumers and a hedge against rising fuel prices due to increased use of domestic and alternative fuel sources;

Organization: National Automobile Dealers Association (NADA)

Since the enactment of EPCA in 1975, NADA has supported the goal of continuous fuel economy improvements. At the same time, NADA recognizes the constraints inherent in a 'push' approach to achieving such improvements. The success of mandates on vehicle manufacturers to research, develop, design, and manufacture vehicles to meet fuel economy performance targets is limited necessarily by the fact that their regulatory obligations end when those vehicles are delivered to the 17,000+ independent businesses licensed to sell or lease them to the motoring public. Real life fuel economy improvements cannot be achieved, and related policy benefits cannot be realized, unless and until consumers actually buy (or lease) and use those new vehicles. [EPA-HQ-OAR-2010-0799-9575-A1, p. 2]

'Push' mandates do not necessarily mean that 'if they build them, they will come.' It is this simple fact that serves as the basis for NADA’s concern. First, prospective new light-duty vehicle purchasers must need or desire to purchase or lease a new vehicle for there to be demand. And, the demand for new light-duty vehicles is and always will be constrained by choices, including the used vehicle marketplace, vehicle service and repair options, and alternatives to light-duty vehicle transportation. [EPA-HQ-OAR-2010-0799-9575-A1, p. 2]

Lastly, prospective new light-duty vehicle purchasers must be willing to make a purchase, assuming they have the need and/or desire and the ability to do so. Factors influencing customer willingness to purchase a new light-duty motor vehicle include, but are not limited to, consumer confidence, perceived operating costs, and expected residual values. [EPA-HQ-OAR-2010-0799-9575-A1, p. 6]

B. Assuming a Need or Desire, and the Ability to Purchase a New Vehicle Covered by the MY 2017-25 Standards, Will Consumers Be Willing to Do So?

Notwithstanding the very significant impact the MY 2017-2025 proposed rule could have on the ability of consumers to purchase or lease new vehicles subject to the rule, many other prospective purchasers with a need or desire to do so will have the ability to buy. For those customers, the issue is whether and to what extent they will be willing to 'pay-up' for fuel economy improvements. Answering this question is not a simple task in that it involves several key hard-to-predict variables and is dependent on the circumstances of individual consumers. [EPA-HQ-OAR-2010-0799-9575-A1, p. 7]

A couple of facts are clear, however. First, as described above, vehicle lenders and lessors do not account for any potential reductions in vehicle operating costs, such as may result from lower household fuel costs, since they cannot predict actuarially if those avoided costs will be saved, let alone be applied to the loan or lease. Second, when assessing the willingness of prospective new vehicle purchases, it is neither appropriate nor fair to rely on surveys of what consumers say they might do if and when offered a new vehicle with improved fuel economy performance. This is especially true when the questioner neglects to note that the respondent must pay a premium up front for that improved fuel economy performance, or fails to accurately quantify that up-front cost premium, or the higher operating costs associated with that premium (additional interest, insurance, taxes, etc.). Indeed, many pollsters in this area fail to accurately inform the respondent of the degree to which the up-front cost premium and higher operating costs will off-set any potential reductions in household fuel expenses, or may fail to remind those polled of any trade-offs that may be involved with vehicles designed to achieve improved fuel economy performance, let alone that they always have used vehicle, vehicle service and repair, and alternative transportation choices. Of course, consumer surveys can play a valuable role in assessing actual behavior, such as when used to evaluate why consumers do what they do or did what they did. But surveys with queries aimed at determining consumer willingness to pay for fuel economy performance 5 to 13 years into the future, which fail to provide respondents with information appropriate to make reasoned responses are of no value and should be considered as such by NHTSA and EPA. [EPA-HQ-OAR-2010-0799-9575-A1, pp. 7-8]

If and to the extent prospective purchasers are unwilling to pay some or all of a regulatory premium for mandated fuel economy improvements, it will negatively impact new vehicle sales and reduce forecasted regulatory benefits. The proposal characterizes increased fuel economy performance (i.e., fuel cost reductions, discounted to the present) as the future benefit that offsets the higher up-front and operating costs needed to buy such performance. In and of itself, this cost/benefit analysis is problematic given that correct estimates of future fuel savings are not simple financial calculations in which one can estimate a discount rate as a corporation might for its cost of money when calculating the net present value of a potential project. It is incumbent upon EPA and NHTSA to accurately consider the expectations of able and willing prospective purchasers, because those expectations will ultimately determine their behavior in the marketplace. As illustrated in and supported by the paper attached as Exhibit D, prospective purchasers form expectations of the net present value of future fuel savings that are related, but not closely related, to a standardized financial calculation. During dramatic upward swings in the price of gasoline followed by heavy media coverage, consumers place a large value on fuel economy, as revealed by shifts in demand to more fuel efficient portion of the market. During slow and steady increases in the price of gasoline with little or no media attention, consumer demand shifts reveal a much diminished value for fuel economy.[15] [EPA-HQ-OAR-2010-0799-9575-A1, p. 8]

In addition, when assessing the valuation of fuel economy improvements by prospective purchasers, the financial benefits of reduced future fuel savings cannot be separated from the utility lost by necessary reductions to other vehicle qualities and performance. For example, if a consumer values an increase in fuel economy of 1 mpg at $500, but gaining this 1 mpg forces a reduction in power or safety valued at $600, then for this consumer the value of the fuel economy gain is negative. [EPA-HQ-OAR-2010-0799-9575-A1, p. 9]

Consumer behavior indicates how these tradeoffs are valued. Indeed, these tradeoffs are available today in dealership showrooms which offer new light-duty vehicles with a wide variety of fuel economy performance, along with variations in other safety and performance features. A classic example of actual prospective purchaser willingness to pay involves a look at sales of models with both a hybrid electric and a conventional powertrain (e.g., Honda Civic, Ford Escape or Focus, Toyota Camry). The average fuel economy spread is approximately 20 mpg at a cost premium of approximately $5,000. In virtually every instance, hybrid sales have been very small and in total, have made up well below 3% of annual light-duty new vehicle sales. The proposed regulations will mandate this tradeoff for all new vehicle buyers. Admittedly, some of this lack of consumer willingness to pay may derive from concerns about new technologies, as suggested by sales experience with the Mercury Milan hybrid which had an up-front price close to a similar, but conventionally-powered model. [EPA-HQ-OAR-2010-0799-9575-A1, p. 9]

Exhibit D includes a review of the pertinent 'willingness to pay' literature, finding that statistical models that do not properly account for the tradeoff between fuel economy and other vehicle attributes will generate a false positive relationship between price and fuel costs, highlighting the significance of these tradeoffs in the mind the average consumer. Based on these revealed preferences, consumers are unlikely to value the proposal’s mandated fuel economy improvements more than the sum of the higher up-front costs for such improvements and other reductions to vehicle quality. In fact, when more reasonable estimates of per vehicle regulatory costs are used, the perceived net benefit will be negative for the average consumer. As a result, many prospective purchasers of new light-duty motor vehicles will be unwilling to 'pay-up' for costly fuel economy improvements, instead opting for less expensive and less fuel efficient options in the used vehicle market or the vehicle service and repair market, or for alternate transportation, thus reducing the proposal’s projected regulatory benefits. [EPA-HQ-OAR-2010-0799-9575-A1, p. 9]

[This comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 57.]

Now, finally, America's auto dealers support continuous improvement to fuel economy. Instead of fighting the customer, we urge the administration to act in a measure [sic] that will leverage consumer demand, maximize fleet turnover and ensuring maximum feasible fuel economy increases.

[Supplemental comemnt to testimony]

I. Fuel Economy Program Success Depends on Consumer Affordability and Acceptance

Several individuals and organizations presented testimony at the hearings suggesting that higher fuel economy production mandates necessarily will result in consumers achieving net fuel economy “savings,” “pay backs,” or “benefits”. Such assertions ignore the fact that no such “savings,” pay-backs,” or “benefits” are achieved unless, if, and until new vehicles covered by the proposed mandates are actually bought and used. The follow key factors do not allow one simply to assume that production mandates will equate to profitable retail sales:

1. The fundamentals of new vehicle financing.

2. The relative importance of fuel economy performance as a purchase criterion.

3. Consumer alternatives to high-priced new light-duty vehicles.

4. The degree to which high fuel prices undermine new vehicle affordability.

5. That any operational “savings” will vary depending on an individual’s or households’ transportation profile. [NHTSA-2010-0131-0267-A1, p.2]

III. Fuel Economy is But One of Many Factors Consumers Consider When Purchasing New Vehicles

When evaluating consumer behavior, the proposal understandably is fuel economy performance focused. In reality, consumers interested in purchasing new vehicles consider a variety of factors. Fuel economy performance may be high on their list, or it may not be there at all. Naturally, when fuel economy performance enhancements involve no additional up-front costs or trade-offs, they are readily accepted by the marketplace. Similarly, as demonstrated by the 2009 Cash-for-Clunkers program, consumers readily accept enhanced fuel economy performance when someone else pays for it. Unfortunately, the proposed fuel economy mandates involve significantly higher up-front costs and/or vehicle performance trade-offs which no one but consumers themselves must pay for. [NHTSA-2010-0131-0267-A1, p.3]

NADA's written comments discussed how the overall new sales mix can vary significantly with dramatic fuel price swings and with the general perception of where fuel prices are headed. However, even when fuel prices are rising, fuel economy is rarely a high consumer priority.4 Since at least 2002, there has been an overall increase in new light-duty fleet fuel economy paralleling a overall increase in real fuel prices (2008 being the exception), with fuel economy standards serving as a back-stop. At the same time, consumers consistently have demonstrated a limited willingness to "pay-up" for higher fuel economy performance. Contrary to the suggestion of many including CFA6, Consumer Reports7, and others, it matters much less what consumers say they will or might do, and much more what they actually do. [NHTSA-2010-0131-0267-A1, p.3]

Actual consumer behavior with respect to "buying" fuel economy is perhaps no more evident than with conventional hybrids. Offering significantly higher fuel economy performance versus their conventional counterparts, hybrids typically are offered at significantly higher prices. To date, hybrid sales have peaked at just above 2% of the new light-duty sales market, despite strong interest from early adopters and car pool lane devotees. For many consumers, they simply do not offer a sufficient total cost of ownership value proposition. [NHTSA-2010-0131-0267-A1, pp.3-4]

IV. Consumers Unable to Afford or Unwilling to Pay Higher Prices Have Other Options

NHTSA and EPA recognize the existence of a "jalopy effect" that occurs when consumers face higher priced vehicles they are unable or unwilling to pay for. This behavioral effect is a cumulative measurement of the degree to which regulatory mandates that increase new vehicle costs or decrease (compromise) new vehicle performance can cause consumers to turn to the used vehicle marketplace, to hold on to their current vehicles longer (the service/repair marketplace), or to seek transportation alternatives. The first two of these consumer choices, if exercised, will inhibit fleet turnover and thereby eliminate regulatory benefits. Depending on the transportation option selected, the third choice actually may result in measurable "benefits," but not without significant negative economic costs. [NHTSA-2010-0131-0267-A1, p.4]

V. Higher Fuel Prices Can Create a Greater Interest in Fuel Economy Performance, But Also Act To Reduce Vehicle Affordability

Consumer interest in fuel economy performance increases as fuel prices rise and when they are expected to trend higher. At the same time, NHTSA and EPA cannot ignore that many individuals and households are less able to afford a new (or new used) vehicle when higher transportation expenses eat into their ability to muster a down payment. [NHTSA-2010-0131-0267-A1, p.4]

---

15 Analysis of wholesale used vehicle transaction data show that demand reactions to significant changes in gasoline prices between 2005 and 2011 vary significantly depending on media reaction, the speed at which the price of gasoline changes, and other economic circumstances. For example between February and July 2008, the price of gasoline (regular, national average)

increased by $1.14/gal. At that time, approximately 70% of the price change for a given vehicle relative to the market average can be explained by its MPG rating, equivalent to a 1.7% relative price per MPG variation for a $1.00/gal. change in the price of gasoline. But when gasoline increased by $0.97/gal. in 2007, consumer reaction was less distinct, with just 8% of the price change for a given vehicle relative to the market average explained by its MPG rating, equivalent to a 0.3% relative price per MPG variation for a $1.00/gal. change in the price of gasoline. Media coverage played a role in the difference in these reactions, as coverage in 2008 was significantly stronger than in 2007. For the 2008 events, a Google News search found approximately 21,700 gasoline price articles (an average of the total referencing 'Gas Prices' and the total referencing 'Gasoline Prices'), while a search for 2007 shows less than half that amount or 8,745.

4 Since 2005, AutoPacific has conducted a bi-monthly Internet survey designed to measure the impact of fuel prices on consumer vehicle purchase decisions and driving behavior. This Fuel Price Impact Study puts years of trend data to work to understand how consumers react to fluctuating fuel prices and how the impact has changed over time. In April 2011, AutoPacific's analysis revealed that, unlike in 2008, a run up in fuel prices from 2010 to 2011 did not drive the market to smaller vehicles and that, while fuel economy improvements are of value in the context of increasing fuel prices, the vehicle type and functionality is of greater importance. Moreover, the run up in fuel prices did not cause a rush to hybrids, with only 21 percent of surveyed consumers stating even a willingness to consider purchasing one. AutoPacific, Americans Want Fuel Efficiency, Not Smaller Cars: No Wholesale Move to Small Cars, Even With High Gas Prices (April 2011). To the extent that the MY 2012-2025 contemplates mix shifting and downsizing as important compliance strategies, the AutoPacific analysis is concerning. See, Knittel, Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector (July 2009). [NHTSA-2010-0131-0267-A1, p.3]

Organization: National Caucus of Environmental Legislators

Strong standards maximize consumer savings at the pump. Under the 54.5mpg-by-2025 standard that you recently proposed Americans would save nearly $45 billion at the gas pump annually by 2030, even after accounting for the cost of new technology. [EPA-HQ-OAR-2010-0799-9443-A1, p. 1]

Organization: National Wildlife Federation (NWF)

These standards don't just deliver for America's outdoor heritage, but for consumers and the economy

Consumers save big. The 2017-2025 proposed standards will save Americans half a trillion dollars. That's tens of billions of dollars a year American families and businesses can spend at home building jobs instead of overseas for oil. Families and businesses will save more than $4,000 in the life-cycle cost of a car or truck, after accounting for the costs of more fuel-efficient technology. [EPA-HQ-OAR-2010-0799-9887-A2, p. 3]

What’s more, many consumers will see saving the moment they drive off the lot. EPA and NHTSA estimate that the gas savings from the more efficient vehicle will offset the additional upfront cost of new technology in under 4 years. But this kind of payback assumes that drivers pay for their vehicles in cash. In fact, most consumers finance their vehicles, and in that case, many will see savings from day one, since the savings monthly on gas outpace the small added finance charge from a modestly higher purchase price. 4 [EPA-HQ-OAR-2010-0799-9887-A2, p. 3]

Put differently, for household budgets, doubling fuel economy is like cutting the price of gasoline in half. For those concerned about cutting dependence on foreign oil and reducing pain at the pump, the best place to drill for oil is under the hoods of our cars. [EPA-HQ-OAR-2010-0799-9887-A2, p. 4]

These standards bring innovation and fuel savings to owners of all kinds of vehicles. For many of our members, the outdoor traditions that mean most to them include getting together with family and friends, loading gear into the truck and heading out hunting or fishing. Across the country, communities and businesses that depend on outdoor recreation depend on these trips. For those who rely on larger vehicles, high gas prices hit particularly hard, and achieving robust fuel efficiency improvements is critical and welcome. [EPA-HQ-OAR-2010-0799-9887-A2, p. 4]

Fortunately, today’s fuel economy standards don’t just focus on cars, but ensure improvement across all vehicle sizes and types to achieve an overall increase in fuel economy and reduction in pollution. And innovation is delivering far better fuel efficiency together with improved power and performance. This means not just financial savings but improved choices for consumers. [EPA-HQ-OAR-2010-0799-9887-A2, p. 4]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 30-31.]

Today’s new vehicles provide a case in point. In a report NWF released in August 2011, we compared the fuel economy, power and performance options available to buyers of the 2011 Ford F-150 pickup truck against a 2005 model they might trade in. The F150 is America’s bestselling vehicle, and the 2011 model incorporated the EcoBoost engine and other innovations that will be widely used to meet the new light duty standards. As shown in Figure 2 below, the 2011 F150’s were more efficient while delivering greater horsepower and better torque, enabling customers to achieve more than 25% increase in fuel economy while still gaining greater performance. [Figure 2 can be found on p. 5 of Docket number EPA-HQ-OAR-2010-0799-9887-A2] [EPA-HQ-OAR-2010-0799-9887-A2, p. 4]

Consumers have responded positively to the more fuel efficient models. The EcoBoost turbocharged V6 model costs approximately $750 more than the comparable V8, but has sold strongly accounting for more than 40% of total sales – and exceeding the company’s sales forecasts. 5 [EPA-HQ-OAR-2010-0799-9887-A2, p. 4]

Consumer support for the most advanced vehicles is also growing. In a recent Consumer Reports survey 56% of adult car buyers said they would “consider an electric or hybrid for their next car”. 8 Sales of plug-in hybrid electric vehicles and battery electric vehicles in 2011, while still relatively modest, were easily comparable to the sales of the first hybrids in 2000 and 2001. 9 [EPA-HQ-OAR-2010-0799-9887-A2, p. 6]

There are many reasons for optimism regarding consumer acceptance of the most advanced vehicles. Compared to most alternative fuels, infrastructure needs for electric vehicles – especially PHEV’s – are relatively modest. As early as this year, automakers will be offering a wide range of alternatives to consumers on the hybrid/ PHEV/ BEV continuum – again providing greatly enhanced powertrain options to consumers, along with other vehicle benefits. Utilities and communities across the country are preparing to facilitate EV adoption, while technology companies are preparing to capture the benefits of connecting vehicles to home and business energy systems. [EPA-HQ-OAR-2010-0799-9887-A2, p. 6]

---

4 Ibid. We find similar “savings as soon as you drive of the lot” for buyers of super duty pickups in our own analysis of the medium and heavy duty rule, in our report Trucks that Work at http://www.nwf.org/~/media/PDFs/Global-Warming/Reports/NWF_TrucksThatWork_FINAL.ashx

5 http://blogs.wsj.com/drivers-seat/2011/10/13/ford-raises-sales-forecasts-for-ecoboost-f-150s/?mod=google_news_blog

8 http://news.consumerreports.org/cars/2011/11/survey-car-owners-want-better-fuel-economy-support-increasedstandards.html

9 http://www.torquenews.com/1075/overhyped-criticism-electric-car-charging-station-subsidies-washington-post

Organization: Natural Resources Defense Council (NRDC)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 199-200.]

Consumers would have an additional $200 billion in their pockets to spend on the economy, thanks to the fuel sipping vehicles.

Consumers win under this proposal because they have more choices of cleaner, fuel-efficient offerings in the showroom. As the agencies' analysis shows, consumers will have net savings of up to $4,400 over the life of their vehicle under the standard. Importantly, for most consumers that finance their vehicles, the net savings will be brought home immediately.

Under the standards the combination of fuel expenditures and new car payments will be lower in the first month. By 2030 the aggregate national savings will provide the equivalent of an annual tax rebate of $330 for every American household.

Consumers want cleaner, more fuel-efficient vehicles, and they are buying them. According to data from the University of Michigan, the average fuel economy of new vehicles since data was first collected in October 2007 has been increasing year over year.

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 70.]

Consumers will benefit from decreased vulnerability to fuel price volatility, and from the long-term fuel cost savings it will more than offset the initial added vehicle costs necessary to meet the standards.

Organization: Pennsylvania State Senate et al.

Under the 54.5mpg-by-2025 standard that you outlined in July, Americans would save over $80 billion at the gas pump annually by 2030. [EPA-HQ-OAR-2010-0799-9914-A1, p. 1]

Organization: Rafter, M.

They also make cars that no one wants to buy. [EPA-HQ-OAR-2010-0799-11587-A1, p. 1]

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Enhancing Consumer Choice and Savings: Americans do not want to guzzle gas or waste billions at the pump, and they want a range of vehicle choices that reflect that. Polls consistently show that Americans support higher standards and are willing to pay more upfront for fuel-saving technology in order to use less gas and spend much less money at the pump. [EPA-HQ-OAR-2010-0799-9549-A2, p. 2]

A recent poll by Consumers Union finds that consumers are increasingly supporting stronger fuel efficiency standards, and the driving force is the cost of gasoline.4 Many consumers are considering more efficient vehicles, including advanced technology vehicles. Over half (56 percent) of respondents said they were considering an electric vehicle for their next vehicle, and 89 percent of consumers who are considering these vehicles cited lower fuel costs as the reason for their choice. [EPA-HQ-OAR-2010-0799-9549-A2, p. 2]

The results of the Consumers Union poll are consistent with polling done by the Go60 campaign in September of 2010. The September 2010 Mellman Poll released by the Go60 campaign found that an overwhelming majority support significantly increasing vehicle standards, even when told it would add $3,000 to the price of a new vehicle. When respondents were informed that the added cost of technology would be offset within four years by savings at the pump, 83% of respondents expressed support for higher standards (67% strongly).5 [EPA-HQ-OAR-2010-0799-9549-A2, p. 2]

It is crucial that the agencies not use inflated and arbitrary discount rates when considering consumer benefits, such as the 25% and 50% discount rates considered in sensitivity analysis for NHTSA's PRIA. Given the consequences of our oil addiction on our economy, environment, national security and on consumer's individual pocketbooks, the full value of the savings and benefits must be accounted for. [EPA-HQ-OAR-2010-0799-9549-A2, p. 3]

While the polling and recent study of Gen Y consumers supports consumer interest in fuel efficiency and willingness to pay for the technologies that will reduce oil consumption and emissions, the auto industry has, historically allowed new vehicle fuel consumption to stagnate absent rising standards. This conclusion is supported by the recent study, Automobiles on Steriods which concludes that between 1980 and 2006 (a period that includes increases due to the original CAFE program) average gas mileage increased 15% and application of technologies that could have significanlty reduced fuel consumption went to support increased vehicle weight and acceleration.10 [EPA-HQ-OAR-2010-0799-9549-A2, p. 3]

The EPA and NHTSA both note that the proposed standards preserve consumer choice by basing the standards on vehicle footprint. The fact is that these standards enhance consumer choice. Consumers today already enjoy a full range of more efficient and less polluting vehicles. A new analysis shows that new vehicles purchased last year "averaged a half-mile more per gallon than those purchased in 2010, an improvement that saved $722 million at the gas pump, where consumers bought 214 million fewer gallons of gas than a year earlier." [EPA-HQ-OAR-2010-0799-9549-A2, p. 3]

This year, Automotive News included in its top 10 new things of 2011, Ford's Ecoboost engine for its F150 trucks – the top selling vehicle in the country. Automotive News writes: "A year ago, who would have guessed that Ford's F-150 pickup buyers would prefer an EcoBoost v-6 to a traditional V-8." This shows that the technologies exist and automakers are putting them to work to improve efficiency and reduce emissions, even in the largest pickup trucks, and that consumers will buy cars and trucks that go further on a gallon of gas. [EPA-HQ-OAR-2010-0799-9549-A2, p. 3]

A recent study by University of Michigan Transportation researchers found that all classes of vehicles offered for sale in the U.S from 2008 to 2011 show improvements in fuel economy.12 [EPA-HQ-OAR-2010-0799-9549-A2, p. 3]

On average, compact cars' fuel economy increased 3.8 mpg to 25.6 mpg, and small pick ups increased 0.4 mpg to 18.6 mpg. While this may not sound like much, the study indicates that automakers are making more fuel efficient vehicles available across the board. Even with these small gains consumers are now able to buy greater fuel efficiency without having to express it as a preference. Absent standards, however, automakers cannot be relied upon to produce fuel efficient vehicles. [EPA-HQ-OAR-2010-0799-9549-A2, p. 4]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 123-124.]

Consumers will save more than $3,500 at the pump even after paying for the fuel-saving technology. Savings will be even greater if gas prices rise above current levels. According to DOT and the EPA these standards will save our economy and consumers more than 311 to 421 billion dollars. These hundreds of billions of dollars will translate into new jobs.

Americans want choices in the vehicle market but they do not want to guzzle gas nor do they want to waste billions at the pump. Americans consistently support higher standards and are willing to pay more to save oil. We can now be confident that technology once used to make vehicles more powerful will be used to improve fuel efficiency from improving the internal combustion engine, better transmissions, high strength lightweight materials, and to hybrid and plug-in vehicles.

The EPA and NHTSA both note the proposed standards preserve consumer choice. The fact is that these standards enhance consumer choice. Consumers today already enjoy a full range of more efficient and less polluting vehicles. The new analysis shows that new vehicles purchased last year averaged a half mile more per gallon than those in 2010, an improvement that saved $722 million at the gas pump where consumers bought 214 fewer billion gallons of gas than the year earlier.

---

4 http://www.consumersunion.org/pub/core_other_issues/018227.html [EPA-HQ-OAR-2010-0799-9549-A2, p. 2]

5 http://www.go60mpg.org/sites/default/themes/go60mpg/pdf/Voters-Support-Fuel-Efficiency.pdf [EPA-HQ-OAR-2010-0799-9549-A2, p. 2]

7 http://www.autoremarketing.com/trends/deloitte-gen-y-may-end-gasoline-domination#ixzz1k2QNjEZA [EPA-HQ-OAR-2010-0799-9549-A2, p. 3]

10 http://web.mit.edu/newsoffice/2011/cars-on-steroids-0104.html [EPA-HQ-OAR-2010-0799-9549-A2, p. 3]

12
http://www.autonews.com/apps/pbcs.dll/article?AID=/20120207/RETAIL01/120209843/1135 [EPA-HQ-OAR-2010-0799-9549-A2, p. 3]

Organization: Slemp III, R. L.

Most people cannot or should not spend this much money on a new vehicle. A lot of bigger vehicles are needed for business and bigger families. The average household will not get any benefit from these vehicles. [EPA-HQ-OAR-2010-0799-6314-A1, p. 1]

Organization: U.S. Coalition for Advanced Diesel Cars

Our comments below assert that technology neutral policies and consumer acceptance are the only proven methods for the automotive industry to move forward with certainty and with the flexibility to seek and strive for new innovations that will dramatically improve fuel economy and reduce emissions. [NHTSA-2010-0131-0246-A1, p.1] [This statement also cross-referenced with section 4]

Market acceptance is also critical to defining the best technology or portfolio of technologies necessary to reach the targets set by government. Failure to adopt technology neutral policies and reality-based vehicle ratings will undermine consumer choice and drive a systematic shortfall in achieving the benefits promised by the new rulemaking. [NHTSA-2010-0131-0246-A1, p.2]

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 240-241.]

Predictions in the NPRM regarding consumer preference and driving habits within the NPRM ignore current data and are inaccurate. The agencies need only look to their predictions for 500,000 electric vehicles to be sold for model years 2012-2016. [NHTSA-2010-0131-0246-A1, pp.2-3]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 244-246.]

Current take rates for passenger HEV's clearly demonstrate consumer hesitance to invest in a vehicle that, while it's fuel efficient on the test cycle, does not fulfill their driving needs. When we refer to take rates, we're referring to the percentage of consumers who purchase an advanced technology powertrain over a standard gasoline powertrain when the option exists on the same vehicle.

From June 2010 to June 2011, the average take rate for HEV's was 5%. That means consumers chose a standard gasoline engine over the HEV version of the same vehicle 95% of the time. Comparing that to the take rate of the clean diesel technology over the same period, consumers chose the diesel option over the standard gasoline version 39% of the time. While both technologies offer comparable fuel savings over a standard gasoline vehicle, diesel technologies lower purchase price, and greater functionality proved more attractive to consumers than the HEV. The Coalition recognizes there are some popular vehicles such as the Toyota Prius that only offer the HEV option, therefore, do not factor into that average take rate referenced above. However, when provided the option, the vast majority of consumers are still choosing the standard gasoline vehicles over HEV.

EPA and NHTSA do not show any market data to suggest consumers will treat full-sized HEV pickup vehicle that, while it's fuel efficient on the test cycle, does not fulfill their driving needs. When we refer to take rates, we're referring to the percentage of consumers who purchase an advanced technology powertrain over a standard gasoline powertrain when the option exists on the same vehicle.

From June 2010 to June 2011, the average take rate for HEV's was 5%. That means consumers chose a standard gasoline engine over the HEV version of the same vehicle 95% of the time. Comparing that to the take rate of the clean diesel technology over the same period, consumers chose the diesel option over the standard gasoline version 39% of the time. While both technologies offer comparable fuel savings over a standard gasoline vehicle, diesel technologies lower purchase price, and greater functionality proved more attractive to consumers than the HEV. The Coalition recognizes there are some popular vehicles such as the Toyota Prius that only offer the HEV option, therefore, do not factor into that average take rate referenced above. However, when provided the option, the vast majority of consumers are still choosing the standard gasoline vehicles over HEV.

EPA and NHTSA do not show any market data to suggest consumers will treat full-sized HEV pickup trucks any differently. In fact, consumers have already displayed significant reluctance to make an investment in a full-sized hybrid truck. In model year 2010, consumers showed the GMC Sierra and Chevy Silverado hybrid .23% of the time preferring the gasoline option in more than 99% of the cases. This amounts to 1165 hybrid models out of nearly 500,000 Sierra and Silverados sold in 2010, yet the incentive assumes consumers will flock to this option.

Organization: Union of Concerned Scientists (UCS)

Consumer and Economic Benefits

According to UCS analysis, full implementation of the proposed 2017-2025 standards would save consumers, cumulatively, $535 billion in avoided fuel expenses through 2030 – over $90 billion in 2030 alone. Even after paying for the additional cost of better technology, consumers would see over $260 billion in net savings through 2030—over $50 billion in 2030 alone. [EPA-HQ-OAR-2010-0799-9567-A2, p. 2]

And while the cost of clean car technology will lead to a modest increase in new vehicle price, the average consumer will save money the moment they drive off the lot. Since most Americans finance the purchase of a new vehicle (or lease it), the higher vehicle price is borne as a slightly higher monthly loan payment, which is more than offset by avoided monthly fuel expenses. Based on an average 5-year, 5% APR loan and the agencies' estimate that the most stringent standards will increase the average vehicle price by approximately $2,000, a consumer's monthly loan payment would increase by $36. However, the standards would save that consumer $81 per month at the gas pump, assuming a price of $3.50 per gallon, resulting in a net monthly consumer savings of $45.2 Further, the consumer will capture the entire value of fuel-savings after the end of the loan period, resulting in even greater savings. [EPA-HQ-OAR-2010-0799-9567-A2, p. 2]

Beyond the monetary benefits to consumers, these standards will provide greater choice in the new and used vehicle markets. Currently, many consumers do not have meaningful options for better fuel efficiency and lower emissions depending on vehicle class. For instance, consumers interested in purchasing full-size minivans in today's marketplace have virtually no clean vehicle options. If fully implemented, the 2017-2025 standards would ensure that automakers apply clean, fuel-efficient technology across the entire fleet of new vehicles for nearly the next decade and a half. [EPA-HQ-OAR-2010-0799-9567-A2, p. 2]

(f) Discount Rates & Consumer Welfare

UCS supports the agencies' decision to continue the use of discount rates of 3 and 7% in the proposed rule. As we have stated previously in both the MY2012-2016 rulemaking and our NOI comments, these discount rates properly reflect realistic interest rates and opportunity costs consumers face in the marketplace. [EPA-HQ-OAR-2010-0799-9567-A2, p. 12]

However, we are concerned that the proposed rule continues to include some debate about the role of private benefits and potential loss in consumer welfare in assessing the total benefits and costs of the program. In the proposed rule, EPA states that, "assuming full information, perfect foresight, perfect competition, and financially rational consumers and producers, standard economic theory suggests that normal market operations would have provided the private net gains to consumers, and the only benefits of the rule would be due to external benefits." [EPA-HQ-OAR-2010-0799-9567-A2, p. 12]

The problem is that none of these assumptions accurately reflect the automotive market or consumer behavior. In the real world, we know that consumers cannot have full information and perfect foresight. For example, EPA window stickers and the EPA Fuel Economy Guide note that "Your Fuel Economy Will Vary." Further, despite having extensive modeling experience and expertise, even the EIA has not accurately predicted gasoline prices – it is a stretch to think that an individual consumer would have more certainty. Consumers also cannot predict future traffic patterns, changes in job location and many other factors that will influence how much they could save on gasoline from various vehicle choices. Consumers also have not had perfect substitutes available in the market. The assertion that "financially savvy consumers could have sought vehicles with improved fuel efficiency, and auto makers seeking those customers could have offered them," indicates unfamiliarity with actual vehicle offerings and a misunderstanding of the risk averseness of highly capitalized industries. [EPA-HQ-OAR-2010-0799-9567-A2, p. 12]

Consider the following example: In model year 2010, the fuel economy range of full-size minivans spanned a mere two mpg, from 18 to 20 miles per gallon. To achieve higher fuel economy, a consumer had one choice, a 23 mpg model that was smaller and less powerful than the others on the market. While a consumer choosing the 20 mpg model instead of the 23 mpg model does indicate that they place more value on the available size and performance than on the benefit of a 3 mpg increase, it does not imply that they would experience a welfare loss should they be given a 23 mpg vehicle with the same size and performance as the 20 mpg model. [EPA-HQ-OAR-2010-0799-9567-A2, pp. 12-13]

Given this market reality, UCS is deeply concerned that NHTSA evaluated scenarios in the proposed rule that would reduce consumer benefits by nearly 25 and 50%.37 This is an unprecedented shift in evaluating the CAFE program and should not be included in the final rule. Unless the agencies can demonstrate that consumers do not value one dollar in fuel savings as being worth one dollar, this is pure conjecture based on economic theory that seeks to apply an ideal market model that does not comport with actual consumer experience in the marketplace. [EPA-HQ-OAR-2010-0799-9567-A2, p. 13]

The agencies should continue including the full private benefits to consumers, using discount rates that reflect market conditions, when calculating the total benefits of the program and should not shift to a system that would include highly uncertain and idealized consumer choice models in the benefits assessments. It was those same consumer choice models that led many companies to dismiss hybrid-electric vehicles like the Prius, airbags, and many other innovations that have seen significant market success. [EPA-HQ-OAR-2010-0799-9567-A2, p. 13]

Strong, cost-effective standards will provide consumers with a wider choice of cleaner and more fuel efficient vehicles that save drivers money. In the absence of standards, market barriers prevent drivers from realizing these savings, leaving drivers without the options they need to respond to volatile and rising gasoline prices. Standards are the right policy approach given the realities of this marketplace. [EPA-HQ-OAR-2010-0799-9713-A1, p. 2]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 217-223.]

Even after paying for the additional cost of better technology, consumers would still see over $260 billion of that savings through 2030.

While the cost of clean car technology will lead to an increase in vehicle price, the average consumer will save money the moment they drive off a lot.

Since most Americans finance the purchase of a new vehicle, the higher vehicle price is borne as a slightly higher monthly loan payment, which is more than off-set by avoided monthly fuel expenses.

The standards also strengthen our economy. By spending less on oil, consumers will have more money to spend on goods and services that will create U.S. jobs.

Hence, the CAFE and GHG standards being discussed in this meeting appear to be necessary from the consumer choice side; that the U.S. auto industry has been party to the setting of this specific standards under discussion in the case; that the standards are feasible and not unduly burdensome. Both sides of the auto market stand to benefit.

---

2 Analysis assumes on-road values of 22 mpg and 37 mpg, corresponding to unadjusted 2-cycle fuel economies of 28 mpg and 50 mpg, respectively.

Organization: United Automobile Workers (UAW)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 24-25.]

One obvious reason is that consumers are demanding more fuel-efficient vehicles, and meeting that demand is an increasingly important part of the business. In an age of rising and volatile fuel prices, American families want to save money on fuel.

Organization: Volkswagen Group of America

Customer shopping habits for cars is highly personal with individuals balancing competing needs and wants against cost. For many people a car will amount to one of their most expensive purchases ever in their lifetime. If an individual is not comfortable with the capabilities or limitations of an advanced technology car, or if they fail to appreciate the long-term benefit, the car will simply remain unsold. Advanced technology left on a dealer’s lot provides no benefit to the environment or return on investment to the company who leveraged capital to develop the car.[EPA-HQ-OAR-2010-0799-9569-A1, p. 13]

Volkswagen applies technologies which we expect will offer consumers with a market acceptable balance of performance and cost. Early adopters excited by the prospects of owning the latest technology will be open to explore new advancements in their purchase decision. However, for many mainstream consumers, the consideration of newer, more expensive, or alternative technology may invoke another set of considerations. Some people may choose more incremental gains of an evolved, but familiar technology, as opposed to jumping into something completely new. [EPA-HQ-OAR-2010-0799-9569-A1, p. 13]

Volkswagen expressed some contrarian views with regards to projected estimates for future technology adoption by consumers. This was even more evident in terms of comprehending consumer demand for the longer 2022-2025 future timeframe. Volkswagen feels it is especially difficult to confidently predict consumer behavior that far into the future.[EPA-HQ-OAR-2010-0799-9569-A1, p. 13]

Organization: Volvo Car Corporation (VCC)

Regardless of the environmental imperatives, it remains difficult to assess what will motivate tomorrow's consumers to actually purchase these highly advanced vehicles in requisite numbers, both to achieve the desired environmental impact and to provide economies of scale. [EPA-HQ-OAR-2010-0799-9551-A2, p.2]

Response:

Comments in this section relate to the effect of the rule on the range of choices available to consumers, consumer acceptance of vehicles built in response to these standards, the use of consumer vehicle choice models to estimate what vehicles consumers will buy, and the role of fuel economy in consumer vehicle purchases (willingness to pay for fuel economy).

Effect of the Rule on Choices to Consumers

EPA agrees with all of these commenters that consumer acceptance of the new technologies used to meet the standards is an important component of the program’s success.

These comments show a diversity of views on consumer response to the vehicles with compliance technologies under these standards.

Some comments indicate that consumers are eager for more fuel-efficient vehicles, with their resulting fuel savings, and the increased choices of technologies and fuel economies that will result from this rule. These commenters find that consumers are willing to pay higher vehicle prices to get greater fuel savings. Some note that consumers want improvements in fuel economy in all vehicle categories, and the footprint-based standards encourage improvements across all vehicle types.

Other comments indicate that consumers are not willing to pay the higher up-front costs required for some of the technologies, especially electric vehicles. Some raise concerns over consumer willingness to change to unfamiliar technologies, and cite low adoption levels of hybrid vehicles as evidence of this reluctance. Others note that improving fuel economy comes at the expense of other vehicle features, such as performance or size, because of technological tradeoffs. Some comments suggest that consumer interest in fuel economy varies with the price of gasoline.

EPA has sought to achieve the goals of reducing GHG emissions and improving efficiency while maintaining safety and consumer choice. The use of the footprint-based standard is intended to maintain the size distribution of vehicles in the fleet; downsizing is not expected to be a compliance strategy. The engineering assessment is based on the costs of adding GHG-reducing technologies while maintaining all other vehicle characteristics at their current levels, with minor exceptions (such as electric vehicles where purchasers nonetheless would knowingly accept limited vehicle range). See EPA RIA Chapter 1.3 explaining how the agencies' methodology for evaluating cost and effectiveness of the various technology packages preserves all existing vehicle utilities as part of the methodology. Thus, we reiterate that the agencies' estimates of the estimated compliance costs of their respective rules include the costs of preserving all the utilities found in the present-day fleet. This analysis thus demonstrates that it is possible to improve efficiency without eliminating other vehicle attributes. That improvement comes at a cost, but the value of the fuel savings is expected to exceed those costs with a payback period of 3.2-3.4 years (see RIA Chapter 5.5) (for purchases in cash; there would be immediate savings for purchases made under now-standard credit arrangements). As discussed in Preamble III.H.1.a, by maintaining all other vehicle characteristics and utilities in its cost estimates, EPA's cost estimates have accounted for tradeoffs with other vehicle characteristics in the reference fleet. Those commenters (e.g., Edmunds.com, IER, and NADA) that indicated that the rules would cause a reduction in vehicle utility – in essence that other desirable features would be sacrificed as fuel economy improved – overlook that the agencies' analyses reflect the costs of preserving all of those flexibilities. The agencies have consequently reasonably concluded that nothing in these standards causes manufacturers to reduce vehicle utility, or results in a situation where consumers no longer have access to some type of vehicle attribute in the present fleet considered to be desirable. See preamble section II.C. We thus disagree with IER that the benefit-cost analysis is fatally flawed because it "omits the cost to consumers of limiting consumer choice." We discuss the (incorrect) assertion from NADA and others that the rule "forces 7 million drivers out of the car market" in Preamble Section III.H.11.b and Section 18.7.1 of this Response to Comments.

At the same time, notwithstanding that both agencies have demonstrated compliance paths that are feasible at reasonable cost without any diminution of present vehicle attributes and utility, the agencies are sensitive to the possibility that the standards may create incentives for manufacturers to reduce utility. For example, as explained in sections II.C.4.aand III.D.6, the agencies were sensitive about truck standards (curve shapes) and stringencies that would create incentives to reduce towing and hauling utility as a compliance path for larger trucks, and also sought to craft standards for which anticipated compliance paths are safety neutral.

The new standards may provide consumers with greater choices in vehicle technologies and fuels, as automakers identify compliance approaches to these rules and may provide multiple versions of models – for instance, the choice between a Ford F-150 with an 8-cylinder engine and a Ford F-150 with a 6-cylinder Ecoboost engine, or hybrid and conventional models of the same vehicle. Consumers then have the opportunity to respond in their purchase patterns. Greater choices should generally improve consumer welfare.

EPA agrees that consumer interest in additional fuel economy in vehicles depends in part on the price of fuel. Because the price of fuel fluctuates rapidly, the resulting varying level of interest in fuel economy on the part of vehicle buyers can lead to problems for auto producers, who need much more lead time to change production and technology levels on vehicles. For instance, when gasoline prices rose suddenly in 2008, many vehicles with poor fuel economy went unsold, and many vehicles with high fuel economy were in high demand. Improving fuel economy reduces vulnerability to fuel price fluctuations; using a footprint-based standard encourages improvements in fuel economy across the fleet, rather than in just some market segments.

The low adoption of hybrids (to date) is not expected to be a good model of consumer response to the technologies used to comply with these standards because we expect most of the technologies used for compliance to involve smaller cost increases and less apparent changes (except to fuel economy) than hybridizing a vehicle. On average, the GHG-reducing technologies expected to be used will involve lower cost increases than strong hybrids. For instance, though the Toyota Camry hybrid has an MSRP roughly $3,000 higher than the cost of a conventional Camry, the average cost of achieving the MY 2025 standards under this rule is about $1,800; in earlier years, those costs are lower. Other commenters (including Ford itself) point out that Ford's EcoBoost engine in the Ford F-150 pickup is proving very popular: though costing $750 more than the comparable V8, it is accounting for more than 40% of sales of those trucks. For most vehicles, then, consumer response to the EcoBoost engine may be a more appropriate model than consumer response to hybrids. Among other things, EPA's projected compliance paths utilize the turbocharged downsized engine technology far more than strong hybrid technology; see Preamble Tables III-47 and III-51.

<u>Consumer Acceptance of Vehicles from Fleets Achieving the Standards</u>

EPA agrees that consumer acceptance of the new vehicles is very important for the success of the program. Commenters show mixed responses: some state that consumers actively want more fuel-efficient vehicles and will respond very positively to the program, while others express concern that consumers may be hesitant about the new technologies and the costs associated with them. We agree with the Alliance of Automobile Manufacturers that it is difficult to predict how consumers will respond to vehicles designed to comply with the standards. We note that sales of vehicles subject to the MY 2012 GHG/CAFE standards have been strong, though we acknowledge that some of the strong sales is due to improvement in economic conditions relative to the low point of the recession. The midterm evaluation provides an opportunity to evaluate the effects of GHG/fuel economy standards on the auto market.

Consumer Vehicle Choice Models

American Fuel and Petrochemical Manufacturers (AFPM) maintains that principles of administrative law compel EPA first to develop a quantitative sales analysis including a vehicle choice model, and to provide notice and opportunity for comment before adopting rules based upon the results of such a model.[54] The premise of its comment is that a quantitative sales analysis based on the results of a consumer choice model is critical to the rule, and that such critical information must be subject to notice and opportunity for comment before a rule can be adopted. AFPM quotes language from the preamble to the proposed rule, which it attributes (incorrectly) to EPA,[55] in support of its premise. Id.

AFPM's premise regarding the centrality of a quantified sales analysis based on consumer vehicle choice models is mistaken. Consistent with CAA section 202 (a), the MYs 2017-2025 greenhouse gas standards for light duty vehicles are premised on the standards being technically feasible at reasonable cost during the lead time provided by the rule. It is correct that, for the GHG rule's objectives to be fulfilled, consumers will have to purchase the vehicles with the added technology, and EPA has carefully considered that issue. Among the factors that lead EPA to reasonably believe that the final standards will result in vehicles that consumers will purchase are: a) the short payback period and net financial benefits to consumers due to fuel savings; b) the auto industry's support for the standards (presumably the industry would not support standards for vehicles which could not be sold); c) due to the footprint-based standards, fuel economy and CO2 emission improvements will likely include the entire range of vehicle footprints (see Preamble section II.C), meaning that there will be more efficient vehicles of every type available for purchase; d) the agencies' costing methodology includes the cost of preserving all vehicle utilities found in the present fleet (see, e.g. EPA RIA Chapter 1.3), meaning that nothing in the GHG rule prevents consumers from purchasing the type of vehicle that best satisfies their needs. None of these bases for EPA's belief that the rule establishes reasonable and feasible standards depends on a quantified sales analysis (much less use of a consumer vehicle choice model).

EPA in fact discussed U.S. vehicle sales impacts at proposal, indicating why the rule could have a positive impact on vehicle sales. 76 FR at 75150-53. This analysis likewise supports the reasonableness of the standards. A quantified sales analysis reflecting consumer choice modeling is thus not critical to EPA's analysis.

[54] These comments were addressed to NHTSA because, at the time, the D.C. Circuit had not yet ruled on industry challenges to EPA's MYs 2012-2016 light duty vehicle standards. Since the time of the comment, the D.C. Circuit rejected all challenges to that rule, as well as all challenges to EPA's endangerment finding and tailoring and timing rules. Coalition for Responsible Regulation v. EPA, no. 09-1322 (D.C. Cir. June 26, 2012). Consequently, EPA is considering these comments to be addressed to EPA as well as to NHTSA.

[55] In fact, the quoted excerpt was a statement made exclusively by NHTSA.

As discussed in Preamble Section III.H.1.a and RIA Chapter 8.1.2, EPA has done extensive research on consumer vehicle choice models. A number of such models exist, but the predictions from those models have rarely been evaluated against each other, or against actual vehicle sales. As also discussed in those sections, EPA has been developing a consumer vehicle choice model, with the goals of better understanding these models as well as the potential impacts of our rules. Those sections explain that EPA does not consider the model to be ready for use in regulatory analysis, in part because we have not had sufficient opportunity to evaluate its performance for predicting impacts on vehicle markets. We also discuss the even greater difficulties in predicting the effects of the rules on sales of advanced technology vehicles, such as electric vehicles, in Preamble Section III.H.1.b and RIA Chapter 8.1.2.7. EPA thus disagrees with American Fuels and Petroleum Manufacturers that using a vehicle choice model is necessary, because it is not yet clear whether vehicle choice models can provide reasonable predictions of the effects of this rule on vehicle sales, especially for advanced technology vehicles.

In place of using vehicle choice models, EPA has provided a robust discussion of the expected impacts of this rule on aggregate vehicle sales and on the factors that are important in determining those impacts in Preamble Section III.H.11.a and RIA Chapter 8.1. As discussed above, we believe that we can reach reasonable conclusions about the feasibility of the rule without use of a vehicle choice model. Moreover, the discussion of these issues in the final rule (see EPA RIA section 8.1.1) is very similar to the information and analysis on vehicle sales EPA presented at proposal. See preamble section III.H.11. Thus, no legitimate issues of adequacy of notice and opportunity for comment arise. In any case, this analysis corroborates the information and analysis on vehicle sales EPA presented at proposal. It has long been held that agencies' use of such corroborative information does not necessitate giving further notice and opportunity for public comment. Community Nutrition Inst. v. Block, 749 F. 2d 50, 57-58 (D.C. Cir. 1984); Chemical Mfr's Ass'n v. EPA, 870 F. 2d 177, 202 (5th Cir. 1989); Time Warner Entertainment v. FCC, 240 F. 3d 1126, 1140 (D.C. Cir. 2001); Chamber of Commerce of United States v. SEC, 443 F. 3d 890, 900-901 (D.C. Cir. 2006). Therefore, no such notice is required here.

The Energy Paradox and the Role of Fuel Economy in Consumer Vehicle Purchases

We agree with several of these commenters that, if our rule analyses are correct, standard economic theory suggests that many of these fuel-saving technologies should be adopted in the absence of the rule, and that it is puzzling that both consumer benefits and producer profits of the magnitudes we estimate are left unadopted. In practice, though, many of these technologies have existed but not been widely adopted. Preamble III.H.1.a. and RIA Section 8.1.2.6 discuss this phenomenon, commonly called the energy paradox or efficiency gap, including the range of hypotheses for its existence and the lack of definitive empirical evidence to explain the apparent gap. The hypotheses mentioned by some reviewers, including uncertainty of future benefits, loss aversion, irreversibility of investments, tradeoffs with other vehicle attributes, and the "positional" nature of vehicles, are discussed in those sections.

On the role of uncertainty of future benefits and irreversibility of investments, we note that high discount rates, attributed to investments in fuel economy being uncertain and irreversible, are a symptom of the issue rather than an explanation. The implicit discount rates found for many energy-saving technologies are far beyond any reasonable market rates. Left unexplained is why the discount rates are so high. We agree with ICCT that this rule may change the reference point consumers use in considering additional technology, and that the rule provides external benefits for energy security (discussed in Section 18.5 of this Response to Comments) and climate change (see Section 16 of this Response to Comments). We nevertheless use a different rationale (see below) for why these standards will increase consumer welfare, by distinguishing between how consumers think of fuel savings when buying a vehicle compared to their post-purchase experience.

The theory that consumers prefer other attributes to fuel economy, or are heterogeneous in their taste for other attributes, does not solve the conundrum, because it is possible to have both the existing vehicle attributes and additional fuel-saving technology. As noted above, EPA's cost estimates include costs of preserving all vehicle utilities found in the present fleet, as well as the costs of adding greenhouse gas emission control technologies. See e.g. RIA at p. 1-40.) Thus, it is incorrect for the IER to say that markets operated efficiently if consumers chose 6-cylinder minivans over more efficient 4-cylinder minivans because they preferred greater power to fuel savings; the conundrum is why 6-cylinder minivans in MY 2010 got 18-20 mpg, when it was possible for them to get higher fuel economy with no loss of power and relatively short payback periods.[56] For the same reason, it is irrelevant to compare, as NADA does, an increase in fuel economy worth $500 to a consumer with a reduction in power or safety valued at $600; a more relevant comparison for the $500 value of fuel economy is the cost of the fuel economy increase for a specified level of safety or power.

We disagree that our rule omits costs associated with limiting choice. As noted above, the standards and analysis in this rule are based on maintaining the diversity of the vehicle fleet – including all the utility of the vehicles comprising that fleet -- and improving fuel efficiency across the fleet. The commenters on this issue did not fully address the implications of the agencies' cost methodology including the costs of preserving vehicle utilities found in the existing fleet. If auto makers choose to change the range of vehicles offered, they would do so only in response to market forces. The diversity of the fleet may increase, if auto makers add alternative-fuel or advanced technology alternatives for existing vehicles to their fleets without removing the conventional versions of these vehicles from their fleets.

We do not know how positionality and the bandwagon effect will affect the markets for more fuel efficiency. If, as the Institute for Policy Integrity (IPI) suggests, greater fuel efficiency starts to confer status for consumers, then acceptance of these more efficient vehicles should be high. If less compensation is needed than the technology costs for consumers to accept these vehicles, as IPI observes, then EPA has overstated the costs to consumers. We note this possibility but are not able to estimate this effect. We also note that the footprint-based standard is aimed to minimize the incentives for automakers to change their fleet size distribution purely in response to the rule. As a result, we do not expect changes in the utility associated with the positionality of autos unless what makes a vehicle confer status changes, a trend about which we do not make predictions.

[56] Indeed, in MY 2012 it is already possible to get a 6-speed minivan rated at 22 mpg. www.fueleconomy.gov.

We note that the commenters critical of EPA's use of the market value for fuel savings in the benefit-cost analysis, including the Walton and Drake study[57] included in the NADA and Defour Group comments, do not provide comments disputing the reductions in fuel use predicted by the proposed MY2017-2025 GHG and CAFE rule, but rather argue that these fuel savings are not worth their market value to consumers. Here we find it important to distinguish between the role of fuel economy in consumers' vehicle purchase decisions and the value of fuel savings that they will receive once the new vehicles are purchased. It is possible that these amounts differ; indeed, the "energy paradox" is defined as this gap between what consumers would "rationally" consider and what they actually consider, as discussed in Preamble Section III.H.1.a. Because reducing fuel consumption saves consumers money, a "rational economic actor" would take into account the expected lifetime fuel savings that s/he would experience when deciding what vehicle to buy.[58] In reality, the role of fuel savings in consumer new vehicle purchases appears to be poorly estimated statistically. A review of the literature finds tremendous variation in the role of fuel economy in consumer purchase decisions.[59] The Defour Group is incorrect, then, when it claims that we "erroneously assume that auto buyers will be willing to pay for 100% of their projected fuel economy gains." It is also incorrect to say that we "find that U.S auto buyers will be willing to pay $6,000 per vehicle for standards achieving a combined 49.6 mpg in MY 2025." As discussed in Preamble Section III.H.11 and RIA Chapter 8.1, EPA has in the past used a five-year payback period in its vehicle sales analysis. This corresponds to 30 to 50% of the expected future fuel savings resulting from these standards.

We note an internal inconsistency in the Walton and Drake study in their arguing both that consumers are behaving fully rationally, and that consumers are not willing to pay the full lifetime value of fuel savings in their vehicle purchase decisions. Economic studies that estimate whether vehicle buyers consider fuel economy "rationally" do so by comparing the estimated willingness to pay for additional fuel economy from their studies with estimates of the *lifetime* fuel savings of vehicles.[60] These calculations of lifetime fuel savings commonly draw on the

[57] Walton, Thomas, and Dean Drake (2012). "Willingness to Pay for MY 2025 Fuel Economy Mandates: Government Estimates vs. Economic Reality." Docket EPA-HQ-OAR-2010-0799-9575 and EPA-HQ-OAR-2010-0799-9319.

[58] Even if the buyer does not expect to own the vehicle for its full lifetime, more fuel-efficient vehicles should be worth more than less fuel-efficient vehicles. Working papers by Allcott and Wozny, Busse et al., and Sallee et al. find that a large portion (arguably all) of the expected future fuel savings of used vehicles is reflected in their purchase prices. Allcott, H., and N. Wozny (2010). "Gasoline Prices, Fuel Economy, and the Energy Paradox." Center for Energy and Environmental Policy Research Working Paper 10-003, Massachusetts Institute of Technology (Docket EPA-HQ-OAR-2010-0799). Busse, M., C. Knittel, and F. Zettelmeyer (2010). "Pain at the Pump: The Effect of Gasoline Prices on New and Used Automobile Markets," Working Paper, University of California at Davis (Docket EPA-HQ-OAR-2010-0799). Sallee, J., S. West, and W. Fan (2010). "The Effect of Gasoline Prices on the Demand for Fuel Economy in Used Vehicles: Empirical Evidence and Policy Implications," Working Paper Version 1.2, University of Chicago (Docket EPA-HQ-OAR-2010-0799).

[59] Greene, D. (2010). "How Consumers Value Fuel Economy: A Literature Review." Office of Transportation and Air Quality, U.S. Environmental Protection Agency, Report EPA-420-R-10-008 (Docket EPA-HQ-OAR-2010-0799).

[60] See, e.g., Allcott, H., and Nathan Wozny, July 2011. "Gasoline Prices, Fuel Economy, and the Energy Paradox." Working paper, pp. 14-18 (Docket EPA-HQ-OAR-2010-0799); Busse, M., C. Knittel, and F. Zettlemeyer. May 2011. "Pain at the Pump: The Effects of Gasoline Prices on New and Used Automobile Markets." Working paper, pp. 21-22 (Docket EPA-HQ-OAR-2010-0799); Sallee, J., S. West, and W. Fan. May 2011. "The Effect of Gasoline Prices on

agencies' estimates of expected future driving and fuel economy and use methods similar to those of the agencies. Thus, a claim that consumers are rational in their approach suggests that EPA should assume that consumers take into consideration the lifetime fuel savings of more efficient vehicles not only in its net benefits calculation, but also in any vehicle sales analysis. As discussed above and in Preamble Section III.H.1 and RIA Chapter 8.1.2.5, EPA instead finds that the value of fuel savings that consumers consider in their buying decisions is likely to differ from full lifetime fuel savings. The Walton and Drake study thus does not provide clear guidance into how to consider consumer fuel savings in either the vehicle buying decision or the benefit-cost analysis, because it asserts two claims that cannot both be true.

If there are two values for fuel economy – the expected future fuel savings over the vehicle's lifetime, and the amount of fuel savings that consumers consider when buying a vehicle – which value should be used in the benefit-cost analysis? Here, commenters differ, with ICCT, Sierra Club et al., and UCS arguing for use of the expected value of future fuel savings, using standard economic parameters including the discount rate, while CEI, the Defour Group, IER, and NADA argue that this approach omits hidden costs or overstates benefits. IPI argues that EPA's cost estimates are likely to overstate costs, but it does not speak specifically to the value of fuel savings in the benefit-cost analysis.

EPA's principle for the benefit-cost analysis is to measure the actual expected impacts of the policy and use standard economic parameters (including discount rates) to measure their monetary value, because those are intended to measure the impacts projected to occur. Using only the amount of fuel savings that consumers think about when buying vehicles is inappropriate because it may not reflect actual fuel expenditure changes due to the rule. Consumers are under no obligation to think "rationally" about fuel savings when buying vehicles; indeed, they are not obligated to consider fuel economy at all. Similar principles apply with discount rates: 3 and 7 percent discount rates represent the opportunity cost of capital to consumers and producers in practice. As mentioned above, very high estimated discount rates for fuel savings in consumer vehicle purchases are a symptom rather than an explanation of the energy paradox. If the rule reduces the fuel consumption of the vehicles that consumers purchase, though, EPA estimates the impacts expected of the rule based on the market opportunity costs.

We note that the Walton and Drake study bases its argument that consumers are willing to pay for 25 percent of fuel savings on a study of technology costs (Laboratory for Energy and the Environment, *On the Road in 2035: Reducing Transportation's Petroleum Consumption and GHG Emissions*, Massachusetts Institute of Technology, July 2008, pp. 61, 156-157). EPA considers using technology costs an indirect approach at best to estimating consumer response, and considers it more appropriate to use the substantial literature (see Greene, footnote 59) specifically looking at consumer decisions on fuel economy. We thus find the 25 percent figure to be derived from a source less relevant to the analysis than those that EPA uses. Walton and Drake, in discussing Greene, state that "The most significant and widespread error – the very same error that is inherent to the agencies' model of consumer choice – is that most of the studies

the Demand for Fuel Economy in Used Vehicles: Empirical Evidence and Policy Implications", Working paper, pp. 12-17 (Docket EPA-HQ-OAR-2010-0799).

and surveys fail to account for tradeoffs between fuel economy and other vehicle attributes of value to consumers – what the studies call 'fixed effects.'"[61] This statement is incorrect. In the studies that Greene reviews, virtually all of them account for other vehicle attributes. As noted above, the agencies' costing methodology also prices in preservation of existing vehicle utilities. We appreciate the effort in Walton and Drake to identify reasons that the existing studies of the willingness to pay for fuel economy find varying results, although they do not provide a recommendation resulting from this critique. We agree that a number of statistical issues arise in estimating this parameter. This problem may not yet be solved. As a result, EPA has approached the use of consumer vehicle choice models cautiously.

We agree that fuel economy changes are likely to influence consumers' vehicle purchase decisions. We discuss the effects of this rule on vehicle sales in Preamble Section III.H.11 and RIA Chapter 8.1.

On the cost side, we base our estimates on the best available engineering data, as discussed in RIA Chapter 5. IER does not identify hidden costs of the rule; rather, it asserts that they must exist. In Preamble III.H.1.a., EPA explains that holding all vehicle attributes other than fuel economy and cost constant allows for direct measure of the welfare costs of the rule. If a vehicle buyer were given an amount equal to the price increase resulting from this rule, she could not be worse off than in the absence of the rule, because she would be able to buy her originally chosen vehicle (though with improved fuel economy). If the vehicle price increases by the same amount as technology cost, as would be expected in a perfectly competitive market,[62] giving her the technology cost fully compensates her for any losses that the rule might impose; it is thus a measure of the full cost of the rule. The technology cost may actually overstate the cost to her, because she may choose to buy a different vehicle and save some of the compensation money for other purposes. IPI argues as well that the technology costs may overstate the rule costs, if the chosen vehicle ends up conferring greater status that makes it more attractive and thus needing less compensation. EPA agrees that this is a possible reason that lower compensation might be required than the technology costs, but we do not have a basis to say that more efficient vehicles will confer greater status in the future.

The Defour Group (Walton and Drake) cites the National Research Council (NRC) for its claim that our cost estimates for this rule are too low. We note that the NRC cost estimates are "for technologies that are commercially available and can be implemented within 5 years."[63] We thus consider the NRC report an inappropriate source for adjusting the cost estimates of this rule, because the cost estimates are based on a much shorter lead time than is available under this rule. Because we consider both the willingness to pay (see above) and cost adjustments used in the

[61] The reference to fixed effects is puzzling: fixed effects are not tradeoffs, but rather dummy variables used in regressions to account for discrete characteristics, such as vehicle type.

[62] The auto market is not generally assumed to be perfectly competitive. In general, though, cost pass-through is commonly less in imperfectly competitive markets. See discussion in Preamble Section III.H.11.a, and Gron, Ann, and Deborah Swenson, 2000. "Cost Pass-Through in the U.S. Automobile Market," Review of Economics and Statistics 82: 316-324 (Docket EPA-HQ-OAR-2010-0799-0675), who found significantly less than full-cost pass-through in the auto industry.

[63] National Research Council, 2011. Assessment of Fuel Economy Technologies for Light-Duty Vehicles. Washington, D.C.: National Academies Press, p. S-1 (Docket EPA-HQ-OAR-2010-0799).

Walton and Drake study to be based on an inappropriate sources, we consider their net benefits estimate of the rule of -$1,400 to -$2,900 to be fatally flawed. Their adjustment to the discount rate is discussed above. Loan rates are discussed in TSD Chapter 4.2.13. Rebound rate is discussed in Section 15.3.3 of this Response to Comments and TSD Chapter 4.2.5. Section 18.7 discusses the Defour and EIA estimates of the effects of this rule on vehicle sales. Preamble Section III.H.11.a and Section 18.7 of this Response to Comments address the comments on vehicle sales. Preamble Section III.H.12 and Section 18.8 of this Response to Comments address the comments on employment. Preamble Section III.H.11.b and Section 18.7.1 of this Response to Comments address the comment on whether these standards are regressive.

Whether these technologies would be adopted in the absence of the rule is discussed in Preamble Section III.D.1 and in Section 12.1 of this Response to Comments. Walton and Drake cite two studies that predict achievement of average fuel economy levels in future years below the fuel economy levels of the rulemaking in the absence of regulation. EPA uses as its baseline a 2008 based model fleet[64] projected out to MY 2025 and meeting the MY 2016 GHG standards in the absence of new standards; there are strong reasons for doing so, as explained in preamble section III.D.1.a. We agree that private market interactions may not provide the level of fuel economy that would occur with the rulemaking. This lack of provision of fuel economy, with its concomitant impacts on greenhouse gas emissions, is a motivation for the rule.

Comments from the National Automobile Dealers Association state that consumers consider at most five years of fuel savings in their vehicle purchase decisions. As discussed in Preamble Section III.H.5, the payback period for the new technologies EPA projects to be needed in MY 2025 is 3.2-3.4 years (see RIA Chapter 5.5).

The assertion from the IER that the rule will drive an estimated 7 million drivers out of the car market is erroneous in that it does not have any relationship to new vehicle purchasers or to new vehicle sales. The analysis that produced this value is not based on households in the market for new vehicles and thus includes many households who will not face direct effects of this rule. This issue is discussed in Preamble Section III.H.11.b. and in Section 18.7.1 of this Response to Comments.

We agree that consumers can and do respond more quickly than automakers to changes in fuel prices. Consumers can easily decide to buy different vehicles, but automakers need lead times to redesign vehicles in response to market signals. Because the rule allows for great diversity in the kinds of vehicles available to consumers – indeed, as discussed in Preamble III.H.1.a, it may increase choices to consumers – consumers will continue to be able to choose among a variety of vehicles, with improved fuel economy expected to be available in virtually all vehicle classes.

Walton and Drake cite criticism of the survey results presented by Consumer Reports (CR). The fundamental question is whether survey results are informative sources for public policy. EPA's analysis of the net benefits of the rule does not rely on survey results of the popularity of fuel economy standards. We note, though, that one criticism raised is that the CR

[64] In an alternative analysis, EPA uses a 2010 based model fleet. See RIA chapter 10.

polling does not ask questions in terms of tradeoffs. In fact, one CR question asked whether the respondent agreed or disagreed with the statement, "I am willing to pay extra for a more fuel efficient vehicle if I can recover the additional cost through lower fuel costs within 5 years," which identifies the opportunity costs. A total of 83 percent agreed, with 48 percent strongly agreeing.[65]

Walton and Drake note that, when presented with the choice of using additional technology to add fuel economy to an existing vehicle or making that existing vehicle larger with constant fuel economy, people have chosen the larger vehicle. Their examples suggest that consumers are likely to pursue additional fuel economy in various market segments: the larger vehicles, after all, are more efficient than without the added technology. Because the rule seeks to encourage additional fuel economy in all vehicle segments, the commenter's argument here appears to support the structure of the rule. The agencies seek to maintain the range of vehicle choices currently available to consumers, but with additional fuel savings across the entire range of vehicle footprints (i.e., to all market segments. For any level of fuel economy, additional power or other vehicle characteristics can be achieved by adding more technology. The rule does not restrict these possibilities.

The Walton and Drake study discusses several papers in seeking to bolster its argument that fuel economy standards impose significant welfare losses. These studies all use older estimates of technology and fuel costs than those used in this rule. Several of them focus on the use of a gasoline tax compared to fuel economy standards. EPA does not tax gasoline. In economic theory, a gasoline tax may have a number of advantages relative to standards, as these papers discuss. Because EPA does not tax gasoline, though, the relative merits of GHG standards versus a tax are not relevant to the MYs 2017-2025 standards. We note, though, that the studies cited[66] note reasons that increased fuel economy standards may be desirable policies in the absence of gasoline taxes. Fischer et al. note that regulation may promote the development of fuel-saving technologies with significant social returns (p. 25). The Congressional Budget Office study states, "If [consumers do not receive adequate information about the fuel savings offered by different vehicles and do not correctly value those savings], then the advantages of an increase in CAFE standards could be greater than assumed here" (p. 4). Parry et al. state that "using standards to cut fuel use by 5 percent under a standard value for CO_2 damages is warranted only if consumers fail to internalize 44 percent of the savings from higher fuel economy" (p. 3). Five years of fuel savings for MY 2025 vehicles, the amount NADA states as an upper limit on how much consumers consider in their vehicle purchases, is approximately 30-50% percent (depending on the discount rate) of the lifetime fuel savings; in other words, under that assumption, consumers fail to consider 50–70% of fuel savings. Using a 5-year or less payback period for vehicle sales purchases, as NADA suggests, may thus mean consumers are

[65] Consumer Reports National Research Center. November 2011. "Consumer Reports Fuel Economy Poll." CU Project #2012.51, p. 22 (Docket EPA-HQ-OAR-2010-0799).

[66] Fischer, Carolyn, Winston Harrington, and Ian Parry (2007). "Should Automobile Fuel Economy Standards be Tightened?" Energy Journal 28(4): 1-29 (Docket EPA-HQ-OAR-2010-0799); Congressional Budget Office, *Fuel Economy Standards Versus a Gasoline Tax*, March 9, 2004 (Docket EPA-HQ-OAR-2010-0799); Parry, Ian W. H., David Evans, and Wallace E. Oates (2010). "Are Energy Efficiency Standards Justified?" Resources for the Future Discussion Paper RFF DP 10-59, http://www.rff.org/RFF/Documents/RFF-DP-10-59.pdf (Docket EPA-HQ-OAR-2010-0799).

likely to "fail to internalize [more than] 44 percent of the savings from fuel economy" – the circumstance under which Parry et al. state that such standards are warranted.

Miscellaneous and Addressed Elsewhere

Fuel Savings to Consumers and Energy Shocks

EPA agrees with commenters that the rule will provide substantial fuel savings for consumers and will reduce vulnerability to shocks in international oil prices. The energy security impacts of the rule are discussed in Preamble Section III.H.8 and in Section 18.5 of this Response to Comments.

Impacts of the Rule on Employment

The impacts of this rule on employment in the U.S. are discussed in Preamble Section III.H.12 and RIA Chapter 8.2. We agree that developing and implementing the new technologies will require additional employment. As discussed in Preamble III.H.11 and III.H.12, employment would increase even more if there are increases in vehicle sales (though we do not quantify vehicle sales impacts). We are not able to predict how employment will change due to changing labor intensity of the new technologies; our analysis of employment in the auto sector is thus partial. The total effects of this rule on employment in the U.S. overall are even more difficult to predict. The effect of a rule on total employment in the U.S. depends heavily on the overall macroeconomic conditions of the country. When the economy is at or near full employment, the primary effect of this rule will be to reallocate workers among sectors, rather than to create or reduce employment; when the economy has substantial unemployment, the rule may have an impact on total employment, through its effects on the auto market, on auto suppliers and other related sectors, on fuel suppliers, and on consumer expenditure patterns.

Continuing Federal Programs for Retooling in the Auto Industry

Providing continuing federal programs to support retooling in the auto industry is beyond the scope of EPA authority.

Multiple measures of MPG

We do not understand Edmunds.com's comment on the "multiple measures of MPG that have emerged from the rule-making process." This rule does not change the information provided to consumers about mpg.

18.2. Analysis of Costs Associated with the Vehicle Standards

Organizations Included in this Section

American Fuel and Petrochemical Manufacturers (AFPM)
Clean Fuels Development Coalition (CDFC)
Growth Energy
Haroldson, C.
International Council on Clean Transportation (ICCT)

Jackson, F.W.
Knapp, B.
Lipetzky, P.
Marshall, C.
National Association of Clean Air Agencies (NACAA)
National Automobile Dealers Association (NADA)
Natural Resources Defense Council (NRDC)
Pennsylvania Department of Environmental Protection
Ross, D.
Smith, Frank Houston
Tarazevich, Yegor
Van Voorhies, M.
Volkswagen Group of America

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

Vehicle Electrification Impacts [EPA-HQ-OAR-2010-0799-9485-A1, p.6]

Recharging during peak hours could increase peak electricity demand. For example, this could happen if many consumers in an area recharge their plug-in vehicle simultaneously in the early evening of a weekday after returning home from work. It could be necessary to restrict recharging to late-night off-peak hours and this could adversely impact the market penetration of EVs. These potential impacts must be analyzed by the agency and presented for comment. Moreover, if electrification requires additional fossil fuel-generated electricity (whether peak or off-peak), then these technologies will not deliver substantial carbon reductions. The proposed rule does not properly analyze these potential impacts, making it impossible to provide meaningful comment upon the agency's estimates of GHG reductions. [EPA-HQ-OAR-2010-0799-9485-A1, p.6]

The agency states that "The analysis in this [EPA/NHTSA] proposal assumes that the consumer market is sufficient to absorb the expected number of EVs without subsidies." 76 Federal Register 75118 This assumption is unrealistic. [EPA-HQ-OAR-2010-0799-9485-A1, p.6]

The National Research Council (NRC) analyzed PHEVs and concluded the following: [EPA-HQ-OAR-2010-0799-9485-A1, p.6]

PHEVs will recoup some of their incremental cost, because a mile driven on electricity will be cheaper than a mile on gasoline, but it is likely to be several decades before lifetime fuel savings start to balance the higher first cost of the vehicles. Subsidies of tens to hundreds of billions of dollars will be needed for the transition to cost-effectiveness. Higher oil prices or rapid reductions in battery costs could reduce the time and subsidies required to attain cost-effectiveness.[11] [EPA-HQ-OAR-2010-0799-9485-A1, p.6]

This NRC committee's realistic assessment is ignored in this rulemaking. The agency must consider these real world implications in assessing the costs and benefits of this rulemaking. [EPA-HQ-OAR-2010-0799-9485-A1, p.7]

11 - “Transitions to Alternative transportation Technologies—Plug-In Hybrid Electric Vehicles, “ 2010, p. 33

Organization: Defour Group LLC

The government and automotive industry are engaged in an ambitious program to raise the fuel economy of today’s new vehicle fleet to 49.6 mpg by 2025. This program is primarily embodied in two rulemakings: one for model years 2012 – 2016 and the rulemaking covered in this NPRM from model years 2017 – 2025. Taken together, these rulemakings represent what may well be the most expensive government-mandated program in automotive history. As such, it is essential that the cost of this program be estimated using the best information available. Unfortunately, in both this rulemaking and the previous one, the agencies involved have deviated from using mainstream economic assumptions to estimate costs in favor of new and unorthodox methodologies. [EPA-HQ-OAR-2010-0799-9319-A1, p. i]

Attached to this letter and incorporated in our official comments by reference is a study by Dr. Thomas Walton detailing our concerns with the economic assumptions made in this rulemaking. Dr. Walton is uniquely qualified to perform this study. Academically, he holds a BA in Economics from the University of Missouri, Columbia and a Ph.D. in Economics from the University of California at Los Angeles. He has extensive experience within government, having served as Special Advisor for Regulatory Affairs, United States Federal Trade Commission and is a former Vice Chair of the Business Research Advisory Council to the United States Bureau of Labor Statistics. He has 24 years of experience within the automotive industry as Director of Economic Policy Analysis for General Motors. [EPA-HQ-OAR-2010-0799-9319-A1, p. i]

It is more important now than ever that government agencies use the best accounting procedures to estimate costs. Historically, government cost estimates were one of many independent cost estimates: today, the government is either directly or indirectly involved in every major effort to estimate the cost of this rulemaking. Government cost estimates are now used both within and outside of government to guide regulatory and investment decisions. [EPA-HQ-OAR-2010-0799-9319-A1, p. ii]

If the government estimates of costs are too low, then the automotive industry may well find itself in the position of producing vehicles that consumers are unwilling to purchase. This could have profound impacts on the U.S. economy. Preliminary analysis by the Defour Group of the cost of this program indicate that consumer demand for fuel economy, which is primarily driven by fuel prices, may wane well before the 2017 model year. If our conclusions are correct, the automotive industry could find that the market for more fuel efficient vehicles will disappear before these standards are due to be implemented. Without additional policies in place to enhance consumer willingness to pay, sales and employment will be adversely impacted. [EPA-HQ-OAR-2010-0799-9319-A1, p. ii]

In conclusion, we urge the agencies to re-estimate the costs of this program using the most mainstream and conservative accounting methodology available. [EPA-HQ-OAR-2010-0799-9319-A1, p. ii]

Organization: Growth Energy

Attachment 1 [pp. 7-15 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] to this letter explains why Growth Energy believes that the analyses supporting the Joint NPRM's electric vehicle cost estimates are not reliable. Under the applicable Executive Orders governing cost-benefit analyses, we believe that the Agencies need to reconsider and revise the current cost-benefit analyses. In addition, given the significant under-estimation of electric vehicle costs in the Joint NPRM's current analysis, Growth Energy questions whether EPA and NHTSA can properly determine that proposed standards are economically practicable and take proper account of the state of technology, as required by the governing statutes. If EPA and NHTSA believe that those methods of estimating the market impacts of regulatory programs that rely upon or require electric vehicles are inadequate or unnecessary, the Agencies should explain why. [EPA-HQ-OAR-2010-0799-9505-A1, p. 2]

Organization: Haroldson, C.

The proposed standards will either make all new vehicles too expensive to purchase or the vehicles will necessarily become too small to be safe to drive. Instead, let's increase our domestic drilling for oil and reduce our dependence on foreign oil. [EPA-HQ-OAR-2010-0799-11137-A1, p. 1]

Organization: International Council on Clean Transportation (ICCT)

5. While the 2011 NAS Report was well done, it specifically stated that only current and near term technologies and costs were analyzed. Thus, the sensitivity analysis using the 2011 NAS Report benefits and costs is inappropriate and should be removed from the Final Rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

5) Sensitivity Case using the 2011 NAS Report Benefits and Costs

NHTSA included a sensitivity case using costs and effectiveness from the 2011 NAS Report. This sensitivity run increases vehicle cost by 40 to 50 percent, adding about $800 to the per vehicle cost. [EPA-HQ-OAR-2010-0799-9512-A1, p. 17]

It is inappropriate to use the 2011 NAS Report technologies and technology benefits and costs for 2017 to 2025 efficiency regulations. While the 2011 NAS Report is an excellent report, it makes several explicit statements constraining the applicability of its technology and cost data to the very near term, e.g.: [EPA-HQ-OAR-2010-0799-9512-A1, p. 17]

'Tables S-1 and S-2 show the committee's estimates of fuel consumption benefits and costs for technologies that are commercially available and can be implemented within 5 years. The cost estimates represent estimates for the current (2009/2010) time period to about 5 years in the future.' [NA5 report page S-1] [EPA-HQ-OAR-2010-0799-9512-A1, p. 17]

'Again, except where indicated otherwise, the cost estimates provided are based on current conditions and do not attempt to estimate economic conditions and hence predict prices 5, 10, or 15 years into the future.' [NA5 report page S-6] [EPA-HQ-OAR-2010-0799-9512-A1, p. 17]

'The cost estimates represent estimates for the current (2009/2010) time period to about 5 years in the future,' [NAS report page 9-8] [EPA-HQ-OAR-2010-0799-9512-A1, p. 17]

While sensitivity analyses can illuminate the impacts of important uncertainties, in this case the 2011 NAS Report expressly states that it is not applicable to the period considered by the proposed rule. In addition, as noted in our comments in section 1, above, the technology benefit and costs in the proposed rule are conservative and overstate the costs of the rule, not understate them. [EPA-HQ-OAR-2010-0799-9512-A1, p. 18]

Organization: Jackson, F.W.

'Faulty' analyses used to create more favorable values: 1. Points to limited areas to make a point without also pointing out complete impact, Le., at National level, 2. Poor competition selected to compare against instead of showing all possibilities and comparing against the best, 3. Using a reference case while 'flexibility' in the law allows far more expensive and less beneficial cases to be selected by profit motivated manufacturers. [EPA-HQ-OAR-2010-0799-8041-A1, p. 1]

So starting with EPA's vehicle lifetime average mileage of 161,851 (cars) & 190,030 (trucks & MPVs) miles and 201635.5 mpgge vs. 2025 54.5 mpgge EPA proposal mix, I calc (assuming gasoline pre taxes at $3.00 per gallon fuel only at pump discounted 20% because it is spread out over many years to reflect the cost as at 2025 to with interest pay for the fuel) fuel savings at $4,333 less $ 1946 added vehicle cost reduces savings to $ 2,387 over the vehicles lifetime. Include taxes based on purchase price and claimed savings are further reduced. And this is against the 2016 35.5 mpgge, i.e., not the best competition; improve the competition, e.g. My Max technologies ICEs vs. EPA Proposal fleet I calc Max ICEs at $4,785 ($ 7,178 with assumed pass throughs) less over the vehicle lifetime. And vs. 36 Bgal corn ethanol 2025 proposal fleet $ 8,004 and $ 12,006 (with pass throughs) less. [EPA-HQ-OAR-2010-0799-8041-A1, p. 2]

6. to account for Business/Govt pass throughs, i.e., inflation/taxes (very significant, albeit not included in most of my data), e.g., assuming for every consumer vehicle lifetime cost business+Govt also have some added cost then the delta cost (all factors included) would be an increase to consumers/taxpayers. For my analyses I assumed a 50 % pass throughs increase/decrease. [EPA-HQ-OAR-2010-0799-8041-A1, p. 2]

Taking all the above into effect and using ref 2 (tables 3.8-23 thru 25) proposal fleet here is what I calc for the 2025 proposal fleet VS. 2025 54.5 mpgge fleet:

EPA proposed fleet vs. 2025 new fleet (54.5 ave mpgge), both using gasoline liquid fuel; system lifetime cost up $174 ($ 261 with my assumed Govt/Business pass throughs), lifetime gCO_2/mile up 14 g/mile. The EPA Proposal fleet has 2.8 % BEVs and 0 % PHEVs. [EPA-HQ-OAR-2010-0799-8041-A1, p. 3]

Conclusion: when all factors fully and properly counted my calc indicates 2025 new fleet lifetime cost due to all Govt actions up, i.e., not down as shown in articles & references! [EPA-HQ-OAR-2010-0799-8041-A1, p. 3]

So while EPA picks and chooses assumptions & methods & credits & multipliers to arrive at 'make believe' savings my analyses yield: the cost to consumers & taxpayers is exceedingly high. And this is when EPA's proposed mix is used and as another 'mix' with increased % of more expensive Plug-ins, e.g., see EPRI mix, that allow more 'guzzlers' I would expect the numbers to get even worse! Also while EPA factors in a strong 2025 EV learning (which I have not factored in), it is also true EPA proposed 2025 fleet has very few Plug-ins so I would not expect a significant cost 'swing' from electrical equipment 'learning' with only minor plug-in penetration. [EPA-HQ-OAR-2010-0799-8041-A1, p. 3]

Summary table of my evaluated 'mix's; 2025 57.4 % cars, 42.6 % Trucks & MPVs: [See table on pp. 3-4 of Docket number EPA-HQ-OAR-2010-0799-8041-A1] [EPA-HQ-OAR-2010-0799-8041-A1, p. 3]

Note: above numbers for EPA & EPRI vehicles include allowed increase in 'guzzlers' that I believe should be added to numbers for allowing them. Other above table numbers do not include 'guzzler' impact as while Govt plan is to allow them, I would not plan to allow them. [EPA-HQ-OAR-2010-0799-8041-A1, p. 4]

Bundling obscures individual vehicle impacts: pretty clear, at National level, plug-ins exceedingly more expensive than ICEs and HEVs; they are also less efficient in fossil BTUs and produce far more National CO_2! Expect EPA knows this, hence very limited penetration in EPA defined 2025 proposal fleet (zero penetration in my Mid and Max). E.g, if in the EPA proposal case with the 36 billion gallons of corn ethanol the HEVs were PHEVs instead, I calc, with assumed pass throughs, the consumer & taxpayer added cost per vehicle at $ 11,745. [EPA-HQ-OAR-2010-0799-8041-A1, p. 4]

Question: with such poor performance and minor PHEV & BEV penetration EPA proposal & reference cases why is Govt promoting and subsidizing plug-ins?? Could it be the only way to get Industry to go along with 54.5 mpgge target is if they have a path to continue highly profitable 'guzzlers'; e.g., if 54.5 average gge is target and for every 101 mpgge vehicle BEV they are able to build 1.5 23.5 mpgge 'guzzlers'. Bummer, Govt borrows money to subsidize BEVs so industry can build 'guzzlers'; taxes & inflation & deficit all up as is system CO_2 and fossil fuel btus! Looks more to me like a 'guzzler protection ace than reducing overall cost, oil and CO_2 greenhouse gas. More specifically, a 101 mpg BEV may not reduce gasoline demand because it could allow 1.5 23.6 mpgg vehicles instead of 1.5 54.5 mpgg, or 1.5 23.6 mpgg vehicles requires 6.36 gg for 150 miles traveled vs. 2.75 gg for 1.554.5 mpgg, a net increase of 3.61 gg which when I credit to the BEV (for allowing the 'guzzlers') I calc reality a 101 mpgge BEV could be 29.4 mpgge when all it's possible National results duly credited! And if Govt allows a 2 multiplier the mpgge 29.4 would drop to 17.2 mpgge Bundling a few BEVs &

'guzzlers' with other vehicles can obscure impact and changing the mix of other vehicles from ICEs to HEVs and/or improved technologies can obscure totally, even show improvement! [EPA-HQ-OAR-2010-0799-8041-A1, p. 4]

Additional relevant comments: [EPA-HQ-OAR-2010-0799-8041-A1, p. 6]

Nation needs much more efficient for Nation energy and money and CO_2 products. I also recognize car companies are a business and have to watch their bottom lines; and I understand their desire to minimize investment, minimize risk and maximize return and early. So to me the answer is for Govt to get involved big time (a Manhattan Project) so development is supported, risk is protected and prices held down by Govt support. After all how do we get the tanks and planes the Nation's military needs, the Govt funds the development and risk and buys the products. Why not use same approach with some mods, e.g., for all Govt vehicle, light and heavy duty, procurements spec vehicles at what the Nation needs and a subsidy for non Govt vehicles based on actual gasoline/Diesel powered real mpg, i.e., higher mpg, higher subsidy, e.g., for Light Duty vehicles costing less than 20 $K then sliding scale to 30$k and over $ 30 $K they should be expected to 'pay their own way' to get the vehicles the Nation needs? As a discussion starting point for Light Duty vehicles I'd suggest Govt offer a $ 250 subsidy for each non Govt Light Duty system mpgge a vehicle gets above that years new vehicle target mpg (I'd even consider adjusting the subsidy up or down based on driver's historical miles per year); and with 2013 target set at 33 mpgge, 2015 at 38, 2018 at 50, 2020 and after at 75mpgge and by 2020 project future dates for more than 75 mpgge (system). The subsidies to be paid for as much as practical as used, i.e., at purchase not a delayed tax rebate, with 'real' today's money; and to benefit from Govt program businesses cannot also engage in counterproductive actions like promoting 'guzzlers' because they are more profitable per vehicle produced and businesses have to show, commit to and get approval by Govt a plan (research, development and production) with measurable by Govt 'benchmarks' and progress reviews. And Govt doesn't have to give money away, i.e., any Govt monies can be repayable loans or stock of equivalent value. And if Congress fails to provide necessary Law for private sector make sure info is clearly articulated, and current Law permitting, consider Govt to sell Govt Spec vehicles to Public and/or Govt buy excess vehicles for resale to Public or Govt require mfgrs to offer Govt equivalent vehicles to Public or update Govt fleet sooner so more resale vehicles are offered to Public. And the Press needs to do and report full & accurate information based on thorough investigative reporting by qualified & objective individuals. [EPA-HQ-OAR-2010-0799-8041-A1, pp. 6-7]

This leaves where does the money come from, how about 'scooping' up other monies of lesser or no equivalent value to Nation's wellbeing: No corn ethanol subsidies and no ethanol mandates, no plug-in subsidies, bump up the gas tax, 'guzzler' tax for individual vehicles not meeting target (e.g., $ 250, or more, for each total to Nation "fossil fuel' gpmgge over target), reduce vehicle emissions testing to minimum based on actual statistical need for most cost-effective necessary plan, no NASA Mars mission (this money and the technical talent can do far more for solving Nation's problems than an interesting venture that doesn't improve citizens lifestyles here on earth), 'capture' some of consumers savings (with hard facts to show savings; e.g., savings per vehicle mile with my Mid or Max technology plan vs. Govt & lndustry E36 'smoke and mirrors' 54.5 mpgg plan and longer lasting vehicles to lower purchase cents/mile); Govt & lndustry plan cost per mile up big time when 'honest' analyses used. Put Nation's resources to use where it benefits the Nation & all citizens the most. [EPA-HQ-OAR-2010-0799-8041-A1, p. 7]

2. EPA Draft Regulatory Impact Analysis 'Proposed Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards' EPA-420-D-11-004 November 2011

Organization: Knapp, B.

With our economy remaining is a severe slump, this is no time to increase the cost of a vehicle. [EPA-HQ-OAR-2010-0799-8255-A1, p. 1]

Organization: Lipetzky, P.

This will only lead to higher fuel and vehicle cost and in the end will amount to the same. [EPA-HQ-OAR-2010-0799-8184-A1, p. 1]

Organization: Marshall, C.

Historically, there have been two topics of pushback by those who would oppose this standard. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Regarding increased costs, my hunch is that the greater than $2K in the added cost of new cars is a worst-case analysis. As a contractor for both EPA and OSHA in rulemaking matters, there were reasons that cost estimates for compliance tended to be higher than what happened in reality under a regulation. We couldn’t easily take into account control cost savings that were expected because of innovation. I suggest putting further thought into finding methods of affordability for people to pay for the incremental capital costs of vehicles. Perhaps an affordability improvement mechanism could be implemented after the regulatory review is performed in 2021 (or 2019) and might depend on revised costs at that time taking into account improvements in powertrain technologies and advances in carbon and composite materials for replacing steel. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 41.]

Measures that could lead to greater penetration to vehicles earlier in the programs could bring down vehicle cost.

Organization: National Automobile Dealers Association (NADA)

NADA is also urging NHTSA and EPA to conduct and include in its final rule a worse case cost scenario reflecting a $12,349 average per vehicle cost to comply with the proposed mandate for MY 2025. This suggestion is being made to reflect the fact NHTSA and EPA are engaged in a rulemaking earlier than necessary aimed at applying mandates further out than necessary where many dynamic and hard to forecast variables are involved. These factors include conventional fuel costs, alternate fuel availability and costs, compliance technologies and their costs, interest rates, the general economy, etc. [EPA-HQ-OAR-2010-0799-9575-A1, p. 5]

If NHTSA and EPA were practiced at setting far-in-the-future standards based on hard to forecast variables, NADA would not be concerned. However, both agencies have historically set new CAFE and emissions mandates consistent with specific statutory time frames and in conformance with the statutory requirements for lead time and duration discussed in detail below. That is, with one major exception. [EPA-HQ-OAR-2010-0799-9575-A1, p. 5]

In the mid to late 1990s, EPA began the process of setting new tailpipe standards for on-road commercial trucks and engines, culminating in rules issued in 1997, 2000, and 2001 for MYs 2004-2010. Largely due to EPA's failure to accurately forecast compliance technologies and costs far into the future, these rules underestimated compliance costs by some 2-5 times what actually were incurred. In addition to detailing this forecasting failure, the attached look-back paper reviews some of the devastating impacts these truck mandates generally had on the new truck marketplace, and in particular on new truck customers, on truck and engine manufacturers and suppliers, and on dealers. [EPA-HQ-OAR-2010-0799-9575-A1, p. 5]

In summary, given this recent and devastating example of what can happened when mandates are set too far into the future, the final rule should include a worse case MY 2025 cost scenario of $12,349 per vehicle, which approximates roughly 4.2 times the $2,936 NHTSA cost estimate discussed above. [EPA-HQ-OAR-2010-0799-9575-A1, p. 5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 69-71.]

And, third, the proposal dramatically underestimates cost impacts on new vehicles.

To work, fuel economy rules must require improvements that are affordable. Why? Because you can mandate what the manufacturers must build but you can't dictate what consumers will buy. If our customers do not purchase these products, we all lose.

Not that we're not suggesting the proposal is technologically infeasible. For example, my manufacturer Ford Motor Company has or can develop the engineering and manufacturing expertise necessary to comply, but at what costs. Our concern is for our customers and the prices that they will face.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 55-56.]

The total cost of the administration's three fuel economy rules is approximately 210 billion. To put this figure into perspective, that's more than twice the amount of total government aid to the auto industry in 2009 and '10. The $157 billion proposal is by far the costliest auto regulation ever, and comes on the heels of the 2010 record-setting $51 billion fuel economy rule. I always have to remember that a billion is a thousand million.

And of course, these new regulatory costs will be borne by customers. And they exclude the billions of dollars in other new regulations you and California regulators have planned. No one in the government seems to be looking at the bigger picture of what all this regulatory activity is doing to the affordability for the average American.

Organization: Natural Resources Defense Council (NRDC)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 199.]

Under the rule, the U.S. would invest about $300 billion in new vehicle technologies bringing cleaner, more fuel-efficient cars and trucks to the marketplace.

Organization: Pennsylvania Department of Environmental Protection

The Agencies Should Evaluate Fuel Costs, Availability, and Impacts of Higher Octane Gasoline.

Costs and Life-Cycle Costs. The extra cost for higher octane gasoline should be used to estimate the costs for this rulemaking. It appears that EPA used the cost of regular gasoline in their RIA (p. 3-15) for this rulemaking. Also, the increased performance that EPA is expecting to achieve from turbocharging and other technologies seems to be based on the vehicle using higher octane fuel. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

All potential costs and environmental impacts must be considered such as supply chain burdens, transportation availability, market transition costs, capital investments for higher octane gasoline and/or for production of additional ethanol or alkylates and the possibility of shortages in some areas of the country. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Nevertheless, we are concerned that much of the nation's gasoline supply will require higher octane levels to meet these GHG standards and that EPA has not considered the implications. EPA either needs to address (in the face of manufacturers' current recommendations) why more mid-grade gasoline will not be needed to run turbocharged, high-compression engines or the implications of greater use of higher octane gasoline should be fully evaluated. [EPA-HQ-OAR-2010-0799-7821-A1, p. 5]

Organization: Ross, D.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 242.]

Anticipated net savings could be much greater if the real price of gasoline rises between now and 2025 as seems all too plausible given rising demand for fossil fuels in low income countries, political and economic unrest in oil-rich regions, and the eventual recognition by the public and political elites of the dire consequences of human-influenced climate change.

Organization: Smith, Frank Houston

State of current ICE technology and Comparative Costs

This clearly demonstrates that the worst case average 'diesel vehicle price premium' is less than $1,800 for European small displacement diesels ... offering a minimum gain in fuel economy of 50% [18 mpg(US)]. [NHTSA-2010-0131-0240-A2, p.2]

For example the new Chevrolet New MY 2012 Aveo 1.3VCDi eco (95PS) (US Sonic?), and Kia 5 door '1 Air' 1.1 CRDi 74bhp ISG Rio are NEDC rated above 78 mpg(Imperial) [≈65 mpg(US)] combined. After excluding value add (VAT) and other EU taxes, both should have list export prices below $15,000 USD including the less than a $1,500 premium for 62% and 40% fuel economy improvements over their respective significantly less fuel frugal gasoline counterparts rated 48 and 56 mpg(Imp) combined, again NEDC. [NHTSA-2010-0131-0240-A2, p.2]

The 1.6 TDCi 95 Edge Econetic Fiesta Titanium offers similar fuel economies for about $18.9k and only roughly $1.3K more than its' 48.7 mpg(Imperial) [≈41 mpg(US)] combined 1.6 Liter gasoline counterpart. The 1.6 L diesel Edge Econetic should export for roughly $16.9K with a possibility of 1.5 gallons/100 miles. [NHTSA-2010-0131-0240-A2, p.3]

In fact there is an 8.5K pound GVW diesel Sprinter 2500 planned for the US in 2013 expected to provide an average 30 mpg(US) in mixed driving… better than the base Sonic. Size/weight may not be the major issues. [NHTSA-2010-0131-0240-A2, p.3]

This leads to the question of which models might already have been (or might be) seen on US highways and what is the best fuel economy they currently offer outside the US results in the following analysis. [NHTSA-2010-0131-0240-A2, p.3] [[See Tables 2 &3 in Docket Number NHTSA-2010-0131-0240-A2, pp.3-4]]

Organization: Tarazevich, Yegor

Introduce gas tax that will gradually grow to $2 per gallon by 2025 to reduce air pollution and oil dependence. Otherwise with high MPG cars will just drive more. With high MPG cars people will still pay less for car ownership than they do today. [NHTSA-2010-0131-0199, p.1]

Organization: Van Voorhies, M.

It is lunacy to think that driving up the cost of cars and trucks is worth the time, effort and cost!! [EPA-HQ-OAR-2010-0799-1629-A1, p. 1]

Organization: Volkswagen Group of America

The 2012-2016 rulemaking will, according to the agencies, cost automakers more than $52 billion – a higher cost than any rulemaking has ever imposed on any regulated industry. Volkswagen continues to make significant investments to both improve our conventional technologies and introduce advanced concepts into the US market. We have crafted a product portfolio that will be attractive to consumers while also achieving compliance with stringent 2012-2016 CO_2 and fuel economy targets. [EPA-HQ-OAR-2010-0799-9569-A1, p. 3]

Cost of compliance for manufacturers weighted more towards light truck sales is projected to be on the order of $1,300-1,600 for 2012-2021. A Wall Street Journal article that appeared online on July 18, 2011 ('White House Offers Auto Makers Concessions to Win Mileage Support') describes how proposals to improve the fuel economy of pickups and sport utility vehicles at a slower pace than passenger cars would 'benefit Detroit manufacturers.' [EPA-HQ-OAR-2010-0799-9569-A1, p. 10]

Response:

Regarding the comments from AFPM that the potential need to restrict recharging times could adversely impact market penetration of electrified vehicles, we do not believe that the market penetrations shown by our analysis (~2% increase in EVs and PHEVs in the 2025MY, see Table III-29 of the preamble) will have sufficient impact on the electrical grid to require any such restrictions to recharging times. As for the AFPM comment that we have not properly analyzed the impacts on carbon emissions that could result from increased electricity demands, this is not correct. We have accounted for increased electricity demands in our analysis as well as the increased carbon and other emissions associated with that increased demand. See preamble section III.F.1 and Table III-64 (showing quantified estimates of upstream electricity and associated GHG emissions attributable to EVs, as there explained, electricity emission factors used in those estimates were derived from EPA's Integrated Planning Model). AFPM also commented that we have made an unrealistic assumption by assuming that the consumer market is sufficient to absorb the expected number of EVs without subsidies. Again, we disagree. We believe that the low penetration rates of EVs and PHEVs shown in our analysis can be made up by early adopters and the kinds of consumers that want such vehicles despite their payback characteristics. Further, we have not suggested that EVs or PHEVs are as cost effective as more traditional technologies; this is why their predicted penetration rate for MY 2025 is quite modest and why they are not projected to be needed at all to meet the MY 2021 standards. What we have shown is that the final standards provide significant public benefit and a path exists toward attaining both the standards and those benefits.

The Defour Group argues that the agencies have deviated from using mainstream economic assumptions to estimate costs in favor of new and unorthodox methodologies. It is not clear what methodologies the commenter considers to be unorthodox. If the meaning is that our use of teardown studies to estimate technology costs was unorthodox, then we disagree strongly. We believe, and nearly all commenters have agreed, that teardown studies represent the best method of estimating technology costs. See Chapter 3.1.1.1 of the joint TSD where we describe the teardown studies conducted for our GHG rules, the peer reviews that have been done and changes made in response to them. Further, we believe that our technology cost estimates represent the best and most up-to-date estimates available today. The commenter also questions our accounting procedures used to estimate costs. The commenter claims that, if the government's cost estimates are too low, auto makers may find themselves building vehicles that consumers are unwilling to purchase. We believe that recent trends suggest otherwise, such as the unexpectedly high sales of the Ford EcoBoost engine despite its higher cost relative to lower fuel economy engine choices for the same vehicle model. Further, at least thirteen automakers have expressed strong support for the proposed standards. We do not believe that they would have done so if they believed the standards compelled production of unsalable vehicles. See also the detailed responses to the Walter and Drake study and critique in section 18.1 above.

Regarding comments from Growth Energy, we have based on EV/PHEV cost estimates on the ANL BatPaC model (battery pack costs) and on FEV teardown studies (electric motors, etc.). We believe that the costs we are using are the best available cost estimates for EV/PHEV technology available. We have also used our High 1 and High 2 markups to estimate indirect costs, and have applied learning effects that are in line with the literature. We disagree with Growth Energy when they claim that we have not estimated costs reliably. Importantly, the information upon which Growth Energy appears to have based this claim is the NAS 2011 report. In that report, NAS states the following about their report, "The cost estimates represent estimates for the current (2009/2010) time period to about 5 years in the future." (See "Assessment of Fuel Economy Technologies for Light-Duty Vehicles," National Academy of Sciences 2011, Summary at page 1.) Therefore, the NAS costs are not applicable for the MYs 2017-2025 rulemaking timeframe. We have discussion of this in RIA Chapter 3.11.7 Further, our final analysis does not project a significant penetration of EV/PHEV technology so the impacts on our program costs are not significant. Lastly, we conducted a sensitivity surrounding our battery-pack costs and our indirect cost markups (which would also impact battery-pack costs) and neither sensitivity suggests significant impacts on the program.

Regarding the comment from Mr. Haroldson, we disagree that vehicles will become too expensive to purchase, especially in light of the significant savings that owners will realize on lower fuel expenditures. Our analysis shows that the cumulative fuel savings will exceed cumulative costs in just over 3 years, well within the typical vehicle ownership period, and that consumers purchasing new vehicles with credit will see immediate reductions in monthly payment amount. See preamble tables III-84 and III-85 and accompanying text. As for safety, we also disagree that vehicles will become too small to be safe to drive. In fact, our analysis was done assuming that vehicles would not change size at all (footprint will not change and, thus, passenger volume will not change). As explained in preamble section II.C and II.G, the footprint attribute removes inherent incentives to downsize as a compliance strategy (downsizing just makes the fleet average more stringent), and the agencies have developed safety neutral compliance paths limiting use of mass reduction as a compliance pathway for lower weight vehicles. Indeed, there were pointed comments (e.g. from CBD and ACEEE) that the proposed standards created incentives to upsize the fleet. Although we disagree with those comments, they stand in stark contrast to the assertions made here. Lastly, while reducing our dependence on foreign oil is a significant benefit of our standards, the primary intent is to reduce GHG emissions. That cannot be done by simply replacing consumption of foreign oil with consumption of domestic oil without a corresponding reduction in oil consumption and related vehicular GHG emissions.

Regarding comments from ICCT, we have not included a sensitivity using the 2011 NAS costs. We agree with the commenter that the costs contained in the 2011 NAS report were meant for the more immediate timeframe and are not necessarily appropriate for use in the 2017-2025 timeframe.

Regarding the comments from Mr. Jackson, the primary point of the comments appears to be that EPA has conducted a faulty analysis in support of the proposal. Mr. Jackson also appears to be concerned that we have assumed certain technology penetration rates to ensure that our rule has the appearance of being beneficial while, if different penetration rates were to occur, our rule would have different costs and benefits. This is incorrect. EPA's OMEGA modeling, the source of the technology penetration rate projections, is entirely transparent and refutes this unfounded comment in all respects. See, e.g. RIA sections 3.1to3.11. Thus, we have not prejudged the technology penetration outcome nor have we forced certain technologies into the mix with the intent of forcing them on the American car buyer. Instead, we have demonstrated what we believe to be the most cost effective approach for each individual auto maker to reach compliance with the final standards given the makeup of that particular manufacturer's fleet. EPA's technology penetrations projections are not binding in any way on the manufacturers, and manufacturers are free to choose any technology pathway for the fleets so long as they are meeting their CO2 target compliance levels. The possible technology outcomes are the result of the standard in conjunction with the footprint basis of the standard and, of course, the technologies available to reach the standards. The outcomes are not predetermined by EPA. Therefore, it is true that a different fleet mix might result in different program costs and benefits, but the fleet mix that will exists in the 2025MY will be driven by the auto makers and the vehicle buying public within the constraints of the standards, not by EPA. Mr. Jackson is also concerned about the multiplier credit available to EVs as a means of encouraging the development of EV technology, which is addressed in Section 4 of this document as well as in preamble section III.C.2.

Regarding comments from Mr. Knapp and Mr. Lipetzky, we disagree that the final rule will result in higher fuel costs—why would fuel costs rise when so much less gasoline will be used—and we disagree with the implication that our rule will be harmful to our slumping economy. In fact, our analysis suggests that the final rule will not only provide significant public benefit, but it may also increase sales and jobs (see preamble sections III.H.11 and 12 and Chapter 8 of the final RIA).

Regarding the comment from Mr. Marshall, we agree that regulatory cost estimates probably overstate reality in general. However, this is a very difficult thing to prove or even analyze. That said, we have attempted to estimate the impacts of learning by doing in making our cost estimates (see preamble section II.D.2.d and Chapter 3.1.3 of the joint TSD). While not overly aggressive in that attempt, we believe that our learning effects strike the proper balance between being conservative and respectful of auto maker and supplier ingenuity.

Regarding the comment from the NACAA, we assume that the claim that, if vehicles equipped with the technologies needed to meet the MY 2025 emissions were introduced earlier then the additional cost per vehicle should be lower than $2000, is a reference to learning effects starting earlier and resulting in lower costs by 2025. While that may be true, one cannot lose sight of the need to introduce new technologies at a sustainable and reasonable pace. We have attempted to provide auto makers sufficient time to introduce new technologies on a pace that will not result in scrapping of new model introductions or requiring model introduction outside of the existing model redesign schedules (thus serving to reduce costs[67]) and on a pace that will not result in costly mistakes and technology failures. in addition, a more rapid phase-in of the standards than we have provided for may well reduce some technology costs by 2025 (due to a longer learning period) but may also increase warranty costs and stranded capital costs, etc..

Regarding the comments from NADA, we have conducted a separate analysis of NADA's (incorrect) claims about the impacts of our heavy-duty highway 2007-2010 rulemaking on the industry. That analysis, given its length and detail, is presented in its entirety at the end of this response section 18.2 as a supplemental response to NADA Exhibit B.. In short, we disagree with NADA's claims and NADA's assertions that we should apply a 4.2x factor to our cost estimates to shed light on the "worse case" (*sic*) scenario. NADA also claims that the rule will result in cars that consumers do not want to buy and, if so, we all lose. We agree that we all lose in that scenario, but disagree that the scenario will play out. In fact, we believe that, for the most part, 2025MY vehicles will look and feel much the same as today's vehicles. There is no reason to believe that the highly boosted and downsized engines upon which the final rule overwhelmingly relies will be unattractive to consumers. In fact, Ford is selling considerably more of its turbocharged and downsized engine equipped F150 pickups than they expected and fewer of the F150s equipped with more traditional V8 naturally aspirated engines. And this is true in a market segment – large pickup trucks – that has traditionally been the one of the least concerned with fuel economy and the most reluctant to accept smaller engines.

NADA also expressed concerns about the high costs of the Administration's three fuel economy/greenhouse gas emission rules. These rules certainly have costs, which the agencies have estimated carefully, but the rules also provide unparalleled savings to consumers and benefits to society that far outweigh the expected costs. We discuss NADA's inappropriate accounting of costs for the rules in section 18.2.1, below. Moreover, these rules have been actively supported by the auto manufacturing industry. EPA strongly doubts that the industry would offer this strong support if manufacturers' believed that the increased costs of installing new technology was either unaffordable or led to unmarketable vehicles.

Regarding comments from the Pennsylvania Department of Environmental Protection, we do not agree that higher octane fuel will be necessary for high compression turbocharged and downsized engines to prevent the onset of combustion knock. EPA assumed no change in the octane of certification or in-use gasoline within its analysis and the effectiveness values used for the high BMEP engines reflect that fact. The current Ford EcoBoost turbocharged GDI engines do not require the use of premium fuel, although those engines are not operating at BMEP levels as high as those expected under our rule. Importantly, a combination of both intake charge dilution (e.g., cooled EGR) and in-cylinder evaporative fuel cooling (e.g., direct injection) are expected to allow higher BMEP GDI engines to operate on regular grade gasoline. All packages

[67] See 75 FR at 25451 describing increased costs associated with introduction of major vehicle changes outside the normal redesign cycle ("[t]he amortized cost of the capital necessary to produce a new vehicle design will increase by 23%, from one-fifth of the capital cost to one-fourth …This would be on top of the cost of the emission control equipment itself. …The capital costs associated with vehicle redesign go beyond CO2 emission control and potentially involve every aspect of the vehicle and can represent thousands of dollars").

at 27 bar BMEP analyzed by EPA included cooled EGR to allow higher BMEP operation and prevent the onset of combustion knock on current certification or in-use fuels. See Joint TSD p. 3-88 ("Use of GDI systems with turbocharged engines and air-to-air charge air cooling also reduces the fuel octane requirements for knock limited combustion and allows the use of higher compression ratios.")

Regarding the comment from D. Ross, we agree that fuel savings will be greater should future fuel prices be higher than projected in the AEO 2012 early release. However, we believe that the AEO projections are the best available projections and that they represent the best projected fuel prices for use in our analysis.

Regarding the comment from Frank Houston Smith, the primary point of the comment appears to be that small engine displacement diesel vehicles like those popular in Europe and other countries provide a possible bridge technology to a future fleet with much lower CO2 emission characteristics. EPA has no preference for the technologies chosen by auto makers, our only requirement is that the standards be met. While it is true that some technologies are receiving credits in the final rule, those credits are meant to incentivize newer and/or emerging technologies. Also, Mr. Smith suggests that it might be necessary to relax the NOx standard such that small engine displacement diesels could more easily meet criteria emissions standards in the US (NOx standards are generally lower for diesels in other parts of the world). This is an idea that EPA opposes for reasons discussed at length in our Tier 2 Highway rulemaking where we took a fuel neutral approach to setting criteria emission standards (see 65 FR 6698 at page 6728, February 10, 2000).

Yegor Tarazevich suggested that EPA introduce a gas tax that would grow to $2 per gallon by 2025 as a means of reducing air pollution and oil dependence. Such an approach is outside EPA's regulatory authority and outside of the scope of this rulemaking.

Michelle Van Voorhies believes that it is lunacy to think that driving up the cost of cars and trucks is worth the time, effort and cost. There are no other details to suggest why Ms. Van Voorhies believes this. We disagree with this comment, since our Benefit Cost Analysis provides considerable detail to support our belief that the new standards will results in significant public benefits and significant savings of fuel resulting in significant reductions of GHG emissions despite the expected increase in new vehicle costs.

In their comment, the Volkswagen Group of America suggests that the costs of compliance for makers of pickups and SUVs is lower than the costs for auto makers whose fleets consist of only cars. Further, the commenter appears to suggest that the standards are structured to benefit the domestic auto makers over other auto makers. Neither comment is true. In fact, each auto maker has a unique standard based on the makeup of its fleet. Likewise, each auto maker has a unique starting point, or baseline or reference point, from which it is starting based, again, on the makeup of its fleet. Another critical factor is the power-to-weight ratio of the vehicles in each manufacturer's fleet, so a vehicle with a footprint of 50 square feet and a high power-to-weight ratio may experience higher costs of compliance than another 50 square foot footprint vehicle with a low power-to-weight ratio. Such is the nature of the footprint based standard. (Many of the manufacturers of these vehicles also chose to pay fines, rather than comply with earlier year CAFE standards. As a result, they have further catching up to do, and hence higher costs.) The point is that the costs for full line manufacturers (i.e., makers of cars and pickups and SUVs) may be lower than for makers of cars only as a result of power-to-weight ratio characteristics more than fleet makeup. A good example of this would be Hyundai and Kia, who have fleet makeups similar to Volkswagen (mostly cars, some SUVs and cross-over utility vehicles/vans, no pickups), but costs of compliance in line with the full line auto makers.

Supplemental response to NADA Exhibit B, "A Look Back at EPA's Cost and Other Impact Projections for MY 2004-2010 Heavy-Duty Truck Emissions Standards", attached to the comments of the National Automobile Dealers Association (on the EPA/NHTSA proposal, "2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards," EPA-HQ-OAR-2010-0799-9575).

In general, and as discussed in detail below, EPA believes NADA's statements included in Exhibit B to its public comments related to the costs of past heavy-duty criteria emission standards are irrelevant to the Light-Duty Vehicle GHG standards and are incorrect in any case.

Heavy-Duty Vehicle Focus in NADA's Exhibit B

Exhibit B in NADA's comments focuses on Class 4 through 8 heavy-duty trucks. In the exhibit, NADA does not describe the relationship between these heavy-duty vehicles and the light-duty market, which consists primarily of passenger vehicles, or how concerns in one market are relevant to the other market. Further, NADA ignores the Class 2b-3 segment of vehicles which share a stronger resemblance to light-duty vehicles in terms of vehicle types, fuels used to power the vehicles, purchasers, uses, and manufacturers.

There are significant differences between the light-duty and the Class 4-8 heavy-duty vehicle markets. Light-duty vehicles include passenger cars, crossover vehicles, sport utility vehicles (SUVs), minivans, and light pickup trucks. On the other hand, the vehicles that NADA discusses in its comments include vehicles such as tractor-trailers, delivery trucks, cement haulers, utility trucks, street sweepers, and urban buses. There is also a significant difference in the engines used in light-duty vehicles when compared to heavy-duty vehicles. Light-duty vehicles are dominated by the use of gasoline engines, while heavy-duty market contains a mix of gasoline and diesel engines but heavy-duty vehicles are predominately diesel powered. The purchasers also differ. Consumers typically purchase light-duty vehicles for their own personal transportation. In contrast, heavy-duty vehicles are most often purchased by commercial fleets and municipalities for the purpose of moving freight or conducting vocational activities, such as street sweepers.

In Exhibit B, NADA ignores the segment of light heavy-duty vehicles which is dominated by the Class 2b-3 pickup trucks. These Class 2b-3 pickup trucks closely resemble their light-duty pickup truck counterparts and are more relevant to any light-duty vehicle discussion. All three of the major U.S. manufacturers offer a light-duty truck, which are often referred to as "half ton" trucks and are sold as the Ford F150, Ram 1500, and GM Silverado/Sierra 1500. The same manufacturers also offer "three-quarter ton" and "one ton" versions of these pickup trucks sold as the Ford F250/350, Ram 2500/3500, and GM

Silverado/Sierra 2500/3500 trucks. The Class 2b-3 trucks are considered heavy-duty vehicles because their gross vehicle weight rating is over 8,500 pounds. The light and heavy pickup trucks share a number of vehicle characteristics, including some common components and, to some extent, the typical vehicle use. See 76 FR at 57160-61 (Sept. 15, 2011).

Table 1 includes a summary of the vehicle characteristics of the light-duty vehicles covered under the MYs 2017-2025 Light-Duty Vehicle GHG rule, the heavy-duty vehicles discussed in NADA's Exhibit B, and the heavy-duty pickup trucks and vans which were not discussed by NADA in Exhibit B.

Table 2: Light-Duty and Heavy-Duty Vehicle Characteristics

	Light-Duty Vehicles Covered by LD Vehicle GHG Rule	Heavy-Duty Vehicles Discussed in NADA Exhibit B	Heavy-Duty Vehicles <u>Not</u> Included in NADA's Exhibit B Discussion
Vehicle Architectures	Passenger cars, SUVs, crossover vehicles, minivans, light pickup trucks (like Ford F150)	Tractor-trailers, delivery vehicles, construction vehicles, utility trucks, buses, and many others	Heavy-duty pickup trucks and vans (like the Ford F250)
Fuel Use	Significant majority are gasoline powered vehicles	Majority are diesel powered vehicles	Split between gasoline and diesel powered vehicles
Typical Purchaser	Individual consumer	Commercial fleets, municipalities, utility companies, and single truck owners	Mix of individual consumers and small businesses (such as landscape companies)
Vehicle Purposes	Personal transportation. Hauling and towing primarily limited to light trucks and vans.	Delivery of freight or other goods, transportation of people, transportation to worksite, worksite power	Mix of personal transportation and hauling/towing.
Major Vehicle Manufacturers	Chrysler, Ford, General Motors, BMW, Mercedes, Toyota, Honda, Kia, Nissan, and many others	Daimler Trucks, PACCAR, Navistar, Volvo, Hino, Ford, and others	Chrysler, Ford, General Motors, Isuzu, Daimler, Nissan, and others

<u>NADA's Market Disruption Claim</u>

NADA claims that "Implementation of EPA's MY 2004-2010 emission mandates directly resulted in higher truck prices, increased operating costs, reduced reliability, and lower fuel economy performance, which caused dramatic disruptions to the new truck marketplace." (Exhibit B, page 3) NADA's exhibit goes on to state that "Many informed prospective new truck purchasers rushed to 'pre-buy' trucks with pre-compliant technologies to avoid the effects of EPA's mandates." (Exhibit B, page 3) NADA uses the heavy-duty exhibit as support for its (strident) assertion that setting standards "further out than necessary" may have "devastating impacts" on the marketplace (NADA comments, Docket EPA-HQ-OAR-2010-0799-9575, page 5). EPA believes that NADA's heavy-duty market disruption claims are not relevant to the Light-Duty Vehicle GHG proposal because of the differences in vehicle types, usage, and markets as discussed above. NADA did not make any claim of pre-buy relative to the heavy-duty pickup trucks and vans (the most analogous heavy-duty vehicle segment, as just explained), and EPA did not find any evidence to support pre-buys in that vehicle segment. Further, EPA discusses three additional reasons why any heavy-duty market disruption claim is irrelevant to the MYs 2012-2017 light-duty vehicle rulemaking.

First, there is a significant difference in the regulatory structure between the heavy-duty standards for criteria pollutants and the light-duty vehicle GHG standards. NADA's pre-buy argument is not applicable to the light-duty vehicle GHG program because of this difference in structure. Under the Clean Air Act Section 202(a)(3)(C), the heavy-duty criteria emission standards are required to apply for a period of no less than three model years, which is commonly referred to as the stability requirement.[68] As NADA points out in Exhibit B, EPA promulgated new heavy-duty criteria pollutant emission standards in 2004 and 2007, with the 2007 standards phased in through 2010. However, unlike heavy-duty vehicle and engine emission standards, the Clean Air Act does not require a minimum stability period for light-duty vehicle emission standards. NHTSA and EPA have structured the light-duty vehicle fuel economy and GHG final standards such that they require *annual* improvements for MYs 2017 to 2025. This builds on the MYs 2012-2016 light-duty vehicle GHG and fuel economy standards. The annual increase in CAFE standards for light-duty trucks actually began for MY 2005 and the annual increase for passenger cars for MY 2011.[69] In addition, the light-duty vehicle GHG standards are a fleet average standard where each manufacturer may select a different standard and compliance path unique to its fleet. For example, some vehicles may see changes in one model year, while others will remain constant. As such, the light-duty vehicle market is not expected to experience a significant change in the vehicles available for sale in any given year. NADA's claim that pre-buys disrupt markets is therefore not relevant to the light-duty vehicle GHG standards because the light-duty program requires modest, annual incremental increases in the stringency and costs of emission standards which are unlikely to have a substantial effect on purchasing behavior.

Second, it is not appropriate to apply NADA's claim of "pre-buy" in the heavy-duty market, in response to the costs of heavy-duty criteria pollutant emission rules, to the light-duty vehicle GHG standards because of the significant financial benefit to consumers accruing from the GHG rules. As documented in the proposal and final rule, the standards will result in a significant improvement in fuel economy and therefore reduce operating costs. Though the standards increase the upfront costs of the vehicles, owners will experience lower operating costs due to the improved fuel economy and reduced GHG emissions. In fact, in the MYs 2012-2016 light-duty vehicle GHG rule, EPA projected an increase in vehicle sales in the 2012 through 2016 timeframe if consumers take into consideration at least five years' worth of fuel savings

[68] United States Code, Title 42, Chapter 85. May be accessed at http://epa.gov/oar/caa/title2.html
[69] U.S. National Highway Traffic Safety Administration. May be accessed at http://www.nhtsa.gov/fuel-economy.

when considering whether to buy a new vehicle.[70] Similarly, as highlighted in the proposal, a light-duty vehicle consumer who purchases a vehicle in the 2017 through 2025 timeframe would not have any financial incentive to avoid the purchase because the average consumer would see a payback in the upfront costs in less than four years and on average gain a net savings of $3,000 to $4,400 over the lifetime of the vehicle based on the proposed standards (discount rates of both seven and three percent, respectively).[71] Consumers purchasing vehicles on credit would see immediate savings because monthly fuel savings more than offset the increase in monthly loan payment amount. Preamble section I.C.

Third, finalizing light-duty vehicle standards for the MYs 2017-2025 timeframe now provides regulatory certainty to auto manufacturers and suppliers along with the opportunity for long-term planning and time for continued development and deployment of GHG emission reducing technologies across the light-duty vehicle fleet. By setting standards with a significant amount of lead time, EPA is addressing one of the concerns raised by a General Accounting Office (GAO) study related to the 2007 heavy-duty standards.[72] GAO suggested that EPA should address concerns raised by purchasers about whether new engines will be ready in time for validation testing by the vehicle manufacturers and truck fleets to help prevent any potential pre-buy of older engines before 2007. Longer lead times, such as those provided in the 2017-2025 light-duty vehicle GHG program, could help consumers be more confident in the performance and durability of these new technologies because it provides the time for auto manufacturers and suppliers to develop and implement technologies in a robust manner and with sufficient time to ensure durability and reliability targets are met.

Finally, NADA's assertions that the 2004 and 2007/2010 heavy-duty emission standards caused the heavy-duty truck sales fluctuations over the past decade are mistaken. EPA believes that there are many factors that impact truck sales in any given year. For example, the American Trucking Associations develops the U.S. Freight Transportation Forecast based on factors such as the change in the U.S. gross domestic product, consumer confidence, housing, capital equipment purchases, government spending, imports and exports, bond yields, and truck capacity utilization.[73] Figure 1 below shows the annual sales of heavy-duty trucks (those with a gross vehicle weight rating of over 14,000 pounds) and the annual rate of change of the U.S. Gross Domestic Product (GDP) since 2000. Although the figure is not intended to imply causality, because other factors are expected to influence vehicle sales, it does provide an indication that factors such as the annual growth rate of the U.S. GDP may have an impact on truck sales.[74]

[70] U.S. Environmental Protection Agency and National Highway Traffic Safety Administration. 75 Federal Register, May 7, 2010. Pages 25517-25518.

[71] U.S. Environmental Protection Agency and National Highway Traffic Safety Administration. 76 Federal Register, December 1, 2011. Pages 74972-74973. See also section I.C to preamble to final rules.

[72] U.S. General Accounting Office. "EPA Could Maximize the Benefits from the 2007 Diesel Emissions Standards by Better Addressing Industry Concerns." Appendix III – Comments from the Environmental Protection Agency. May be accessed at http://www.gpo.gov/fdsys/pkg/GAOREPORTS-GAO-04-313/html/GAOREPORTS-GAO-04-313.htm

[73] American Trucking Associations, Inc. U.S. Freight Transportation Forecast to 2022. Pages 10-12 and 52-53. 2011.

[74] The correlation between the truck sales and the annual GDP percent change was +0.78.

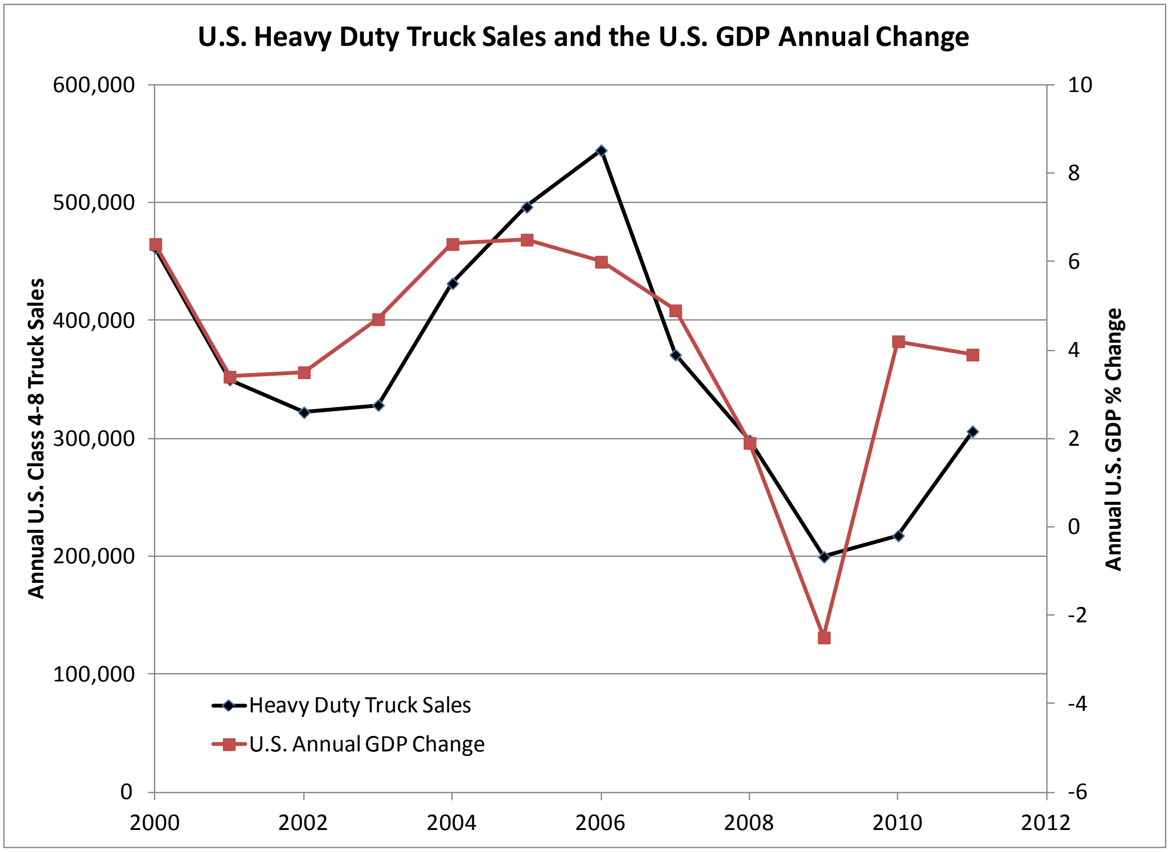

Figure 1: U.S. Class 4-8 Truck Sales and U.S. GDP Annual Growth Rate[75]

Projected Cost of Compliance

NADA's Exhibit B also discusses EPA's projected fixed and operating costs of medium and heavy heavy-duty engines related to the 2004 and 2007/2010 criteria pollutant emission standards. NADA claims that by setting standards seven to ten years before implementation, EPA "dramatically underestimated" the costs associated with the program (Exhibit B, page 3). NADA makes no attempt to comment on the specific details of EPA's detailed cost analysis for the proposed MYs 2017-2025 light duty vehicle standards (with the exception of indirect costs which we address in responding to NADA's Exhibit A) and NADA's discussion is focused on costs that are not related to the light-duty vehicle GHG standards. We nonetheless explain why NADA is incorrect as to that other rule.

As stated in the 2007/2010 heavy-duty emissions rule, EPA developed the compliance costs of the NOx standard assuming that NOx adsorbers would be the most likely technology

[75] U.S. Truck Sales represent Class 4-8 truck sales from Ward's Auto Group's "U.S. Truck Sales by GVW by Month" 2000 through 2011. U.S. Gross Domestic Product percent change based on current dollars from the Bureau of Economic Analysis. Last accessed on May 8, 2012 at http://www.bea.gov/national/index.htm#gdp

applied by industry in order to meet the NOx standards.[76] As noted in the 2007/2010 HD rule, we recognized that manufacturers had several years before implementation of the standards and we expected research would lead to enhanced emission control technologies with focused research efforts on drawbacks, such as fuel economy impacts, in an effort to minimize any potential negative effects.[77] As a result of the industry's research and development efforts, most heavy-duty engine manufacturers selected a technology path that included selective catalytic reduction (SCR) for 2010 NOx compliance rather than NOx adsorbers. There are several reasons why manufacturers selected this technology for the market. For one thing, manufacturers introduced SCR into the European heavy-duty market in the 2006 timeframe to meet the Euro V emission standards.[78] The earlier introduction of the technology in Europe provided engine manufacturers time to gain experience with the technology in the marketplace before it was implemented in the United States. The use of SCR in the U.S. also provides global engine manufacturers with ability to use the research and development experience that they gained in Europe in addition to the potential economies of scale to reduce costs. SCR also provides the manufacturers with the flexibility to balance engine-out NOx emissions and fuel consumption to meet market demands. We believe, and manufacturers have provided confidential business information to support, that manufacturers have the ability to raise the engine-out NOx emissions of 2010 engines equipped with SCR to levels above the 2004 NOx levels in an effort to improve fuel consumption while remaining in compliance with NOx emission standards.

We would expect the cost analysis conducted by NADA to show that the compliance costs and manufacturer surcharges with respect to the 2007/2010 rule are different for two reasons. First, EPA developed costs in the 2007/2010 rule for a different emission reducing technology than the technology that was actually used in the market. Second, NADA used manufacturer surcharges in the comparison. Manufacturer surcharges are not equivalent to compliance costs. As would be expected, surcharges are often greater than the compliance cost because they are set by the manufacturers based upon what they believe the market will bear. This premise is supported by confidential business information submitted to EPA for the Heavy-Duty Engine Nonconformance Penalty proposal.[79]

EPA attempted to conduct a retrospective analysis of our projected costs of the heavy-duty gasoline engine emission standards. However, we were unable to develop a robust method to identify the gasoline engine price (or cost) increases that were solely related to emissions which were passed along to consumers in the heavy-duty pickup market.

However, EPA has conducted a simple analysis of the projected costs of the 2004 and 2007/2010 light heavy-duty diesel engine standards relative to the price increases that one major manufacturer actually placed on their heavy-duty diesel pickup trucks. As noted above, these pickup trucks are more similar to the half-ton pickup trucks included in the light-duty vehicle segment than are the heavier trucks referred to by NADA. EPA is utilizing manufacturer

[76] 66 FR at 5090, January 18, 2001

[77] 66 FR at 5090, January 18, 2001

[78] Cummins. Diesel Exhaust Fluid (DEF) Q &A. Last accessed on June 19, 2012 at http://www.cumminsfiltration.com/pdfs/product_lit/americas_brochures/MB10033.pdf

[79] 77 FR at 4736, January 31, 2012.

surcharges in this analysis as a proxy for cost, similar to the approach taken in the NADA analysis, though we have no reason to believe that these particular surcharges were equal to costs associated with emissions abatement equipment.[80] In the analysis below, EPA compares the cost increase that we projected in the 2004 rule, adjusted to 2004 dollars, to the price difference of the diesel engine option on a Ram 2500 pickup truck between 2003 and 2004. As shown in Table 2, the cost increase projected by EPA for the 2004 standard was $541 and Chrysler increased the price of the diesel engine option on the Ram 2500 by $330. By this comparison, EPA's projected cost increase of the 2004 emission standards was $211 greater than the manufacturer's actual price increase.

Table 3: EPA Cost Estimate and Manufacturer Price Increase for 2004 Light Heavy-Duty Diesel Engine Standard (all values in 2004$)

Manufacturer Price Increase[A,B]	$330
EPA Cost Estimate[C]	$541
Manufacturer Price – EPA Cost	**-$211**

Notes:
[A] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options. 2003 Surcharge was $5,225. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2003/standard-equipment/
[B] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options. 2004 Surcharge was $5,555 (2004$). Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2004/standard-equipment/
[C] 2004 Light Heavy-Duty Emission Standard Cost was $485 (1999$). See 65 FR October 6, 2000 at 59936.

Next, EPA compared the cost increase projected in the 2007 heavy-duty rule, adjusted to 2007 dollars, to the price difference of the diesel engine option on a Ram 2500 pickup truck between 2006 and 2007. As shown below in Table 3, EPA's projected cost increase for the 2007 standard was $2,429 and Chrysler increased the price of the diesel engine option on the Ram 2500 by $545. EPA's projected cost increase of the 2007 emission standard was $1,884 more than the price increase of the diesel engine option for this category of engines.

[80] The Agency believes that the heavy-duty engine industry may not be a perfectly competitive market due to the limited number of manufacturers. In a concentrated market like this, pricing strategies such as surcharges may include additional costs for non-regulatory imposed features, non-emission-related regulatory imposed features or additional profit margin.

Table 4: EPA Cost Estimate and Manufacturer Price Increase for 2007 Light Heavy-Duty Diesel Engine Standard (all values in 2007$)

Manufacturer Price Increase[A,B]	$545
EPA Cost Estimate[C]	$2,429
Manufacturer Price – EPA Cost	**-$1,884**

Notes:
[A] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options was $5,555 in 2006. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2006/standard-equipment/
[B] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options was $6,100 in 2007. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2007/standard-equipment/
[C] 2007 Emission Standard Cost was $1,986 (1999$). Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (EPA 420-R-00-026), page V-38. Last accessed on May 7, 2011 at http://www.epa.gov/otaq/highway-diesel/regs/ria-v.pdf

Finally, we compare the cost increase projected in 2010 for the 2007/2010 heavy-duty rule, adjusted to 2010 dollars, to the price difference of the diesel engine option on a Ram 2500 pickup truck between 2009 and 2010. As shown below in Table 4, the projected cost increase for the 2010 standard was $2,046 and Chrysler increased the price of the diesel engine option on the Ram 2500 by $2,060 in 2010. In this instance, the projected the cost increase of the 2010 emission standards was $14 less than the manufacturer's price increase for this category of engines.

Table 5: EPA Cost Estimate and Manufacturer Price Increase for 2010 Light Heavy-Duty Diesel Engine Standard (all values in 2010$)

Manufacturer Price Increase[A,B]	$2,060
EPA Cost Estimate[C]	$2,046
Manufacturer Price – EPA Cost	**$14**

Notes:
[A] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options was $6,100 in 2009. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2009/standard-equipment/
[B]Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options was $7,615 in 2010. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2010/standard-equipment/
[C] 2010 Emission Standard Cost was $1,601 (1999$). Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (EPA 420-R-00-026), page V-38. Last accessed on May 7, 2011 at http://www.epa.gov/otaq/highway-diesel/regs/ria-v.pdf

In summary, the most relevant heavy-duty engine cost discussion for the light-duty vehicle GHG standards did not show that EPA underpredicted costs by "two to five times the actual costs" as incorrectly claimed by NADA (Exhibit B, page 11).

Conclusion

In conclusion, NADA commented on the 2017-2025 Light-Duty Vehicle GHG proposal by submitting a review of the costs of EPA's 2004-2010 heavy-duty standards and a discussion on other impacts on heavy-duty vehicles. Two of the premises of the NADA exhibit were that rulemakings which provide seven to ten years of lead time lead to misrepresented costs and result in market disruptions. This memo discusses why EPA believes that any heavy-duty market disruption claim is irrelevant for the Light-Duty Vehicle GHG program because the regulatory structures of the programs are different and because the GHG program reduces operator costs, unlike a criteria pollutant emission program. NADA fails to discuss any of the market differences between passenger cars and commercial heavy-duty vehicles. In addition, NADA ignores the most relevant segment of the heavy-duty market, the large pickup trucks, for comparison to light-duty vehicles. EPA has examined the actual price increase for the heavy-duty pickup trucks and found they were generally less than the EPA cost estimates, not greater as NADA mistakenly asserts. In addition, we found no evidence of market disruptions for these vehicles during the implementation of the 2004 or 2007/2010 emission standards.

18.2.1. Per Vehicle Average Costs

<u>Organizations Included in this Section</u>

American Petroleum Institute (API)
BMW of North America, LLC
Consumer Federation of America (CFA)
Cuenca, M.
Jackson, F.W.
National Association of Clean Air Agencies (NACAA)
National Automobile Dealers Association (NADA)
Ross, D.
Steyn, R.

Organization: American Petroleum Institute (API)

The market place will determine the need for premium (higher octane) fuel

The EPA and NHTSA note that their assessment of the cost of technologies adopted to comply with the proposed CAFE and GHG standards was not predicated on the need for premium gasoline, and they request comment on this assumption. API concurs with the approach used by EPA and NHTSA in this regard. The market place will address and determine the octane needs of motor vehicles – as it has done, successfully, for decades. There is no need for government agencies to adopt a regulatory approach that pre-determines, prescribes, or specifies vehicle octane requirements. [EPA-HQ-OAR-2010-0799-9469-A1, p. 11]

Octane needs are already addressed by the market and do not require government intervention
The market place will address octane needs of vehicles as it has done successfully for decades.

There is no need for government agencies to pre-determine, prescribe, or specify vehicle octane levels. [EPA-HQ-OAR-2010-0799-9469-A2, p. 2]

Questionable Vehicle Cost and Consumer Benefit Estimates

EPA and NHTSA state that the proposed standards “would have significant savings for consumers.” This is based on an average increased cost of $2,000 for a MY 2025 new vehicle and a present value of fuel savings over the vehicle lifetime ranging from $5,200 to $6,600, depending on whether a 7% or 3% discount rate is used. The uncertainty over increased vehicle cost and the discount rate consumers would implicitly use to value fuel savings raises significant questions about the EPA/NHTSA claim that a consumer would see a “net lifetime savings of $3,000 to $4,400.” [EPA-HQ-OAR-2010-0799-9469-A1, pp. 9-10]

As one example, it should be noted that the Energy Information Administration’s Annual Energy Outlook 2011 included a sensitivity case with a 6% per year increase in CAFE -- reaching approximately 55 mpg in 2025. That sensitivity case estimated that such a CAFE requirement would increase the average cost of a new 2025 vehicles by about $4,600 relative to vehicles meeting the existing 2016 mpg requirement. The EIA cost increment is more than twice that of the EPA/NHTSA estimate, and likely reflects the use of a different set of assumptions that drive significantly higher penetrations of electric vehicle and diesel technologies into the light-duty vehicle fleet.22 Additionally, EIA uses a 15% consumer-relevant discount rate when evaluating the economic cost effectiveness of new vehicle efficiency technologies. A 15% discount rate would reduce the present value of fuel savings by about 40% to 50% compared to the EPA/NHTSA calculations. Combining EIA’s higher vehicle cost with a consumer relevant discount rate would turn the EPA/NHTSA consumer net benefit conclusion into at best a consumer break-even and more likely a consumer net cost. Furthermore, the EPA/NHTSA conclusion that a consumer paying cash for a new MY 2025 vehicle would see the added vehicle cost offset within 4 years by fuel savings would no longer be accurate. [EPA-HQ-OAR-2010-0799-9469-A1, p. 10]

Given these uncertainties, it is not at all clear that the EPA/NHTSA proposal would, as claimed, “preserve consumer choice – that is, the proposed standards should not affect consumers’ opportunity to purchase the size of vehicles with the performance, utility and safety features that meets their needs.” [EPA-HQ-OAR-2010-0799-9469-A1, p. 10]

---

22 When viewed in relation to projections made in similar studies conducted by the National Research Council (http://www.nap.edu/catalog.php?record_id=12924) and by the Massachusetts Institute of Technology (http://web.mit.edu/sloan-auto-lab/research/beforeh2/otr2035/On%20the%20Road%20in%202035_MIT_July%202008.pdf) , one observes a substantial range in the estimates of future incremental automotive technology costs, effectiveness and market penetrations, even in the near - to medium-term timeframe. In this context, the longer term projections made by EPA and NHTSA for the subject NPRM are particularly uncertain, reflecting, as they do, specific assumptions regarding future fuel prices,

product lifecycles, impacts of other anticipated regulatory initiatives, etc., etc. [EPA-HQ-OAR-2010-0799-9469-A1, p. 10]

Organization: BMW of North America, LLC

The projected cost increase of US $734 in MY 2021 and US $1946 in MY 2025 relative to 2016 in the joint draft TSD is only valid for the average new US vehicle. The actual cost increase for the average BMW Group vehicle is much higher than projected in the joint draft TSD just because of the higher E-mobility share needed for future compliance (as mentioned above) and the need for much more expensive conventional improvement technologies (high-cost lightweight materials, etc.). [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 5]

Regarding the calculations of the projected cost increase per automaker in the joint draft TSD, the projected cost increase for the BMW Group fleet at the level of a large volume manufacturer or slightly lower is not at all accurate if considering the above mentioned high E-mobility share needed for the BMW Group. [EPA-HQ-OAR-2010-0799-9579-A1, enclosure p. 6]

Organization: Consumer Federation of America (CFA)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 61.]

The past 16 years, automobiles have increased an average of $500 a year. So this is a small price to pay for extra fuel economy and extra savings.

Organization: Cuenca, M.

Transportation is critical to our quality of life and the EPA's regulation could increase the cost of a new vehicle by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-10142-A1, pp. 1-2] (Also in Section 18.8)

Organization: Jackson, F.W.

3. EPA 11/16/11 Article '..... 2016 through 2025 model year. .. increase by $ 1,946 per vehicle' Not so 'per vehicle', Le., while each individual by class vehicle average might increase by this amount to incorporate the defined (e.g., turbochargers) technologies, there is also a class 'mix' impact that does not appear to be factored in by EPA to obtain their $ 1946; e.g., if I take a 2016 Camry and spend $ 1,946 to increase its mpg, fine; but if I build one less Camry and build one more Prius (both with same defined technologies upgrade) I also increase the cost another 4-6 $sK to convert to a Hybrid; and by not considering fleet 'mix' change impact the Hybrid cost does not show! And building a plug-in (e.g., Volt with 'fast' charging stations) instead of an ICE and the 4-6 $sK additional for a HEV grows to about 20 $s K per switch to a PHEV (e.g., Volt). Even 15% (EPA proposal percentage ref 23.8-21-23) HEVs in 2025 at 4 K$s added would alone be 600 $s - subtracting the $ 600 from the reported $ 1946 cost increase leaves $1346 for all

other upgrades and ref. 2 shows up to $ 1426 for high level turbo boost, $ 338 for V-6 Direct injection plus a number of other upgrades in the $100-200 range. We need to hear from EPA on whether the 'mix' factor is included in their reported $ 1946 value but from my brief look at their document it didn't appear to me it was in; the fact that EPA has one value ($ 1946) would support mix impact not factored in, i.e., different mixes would have different numbers! I also note in Ref. 2 EPA proposal fleet 2025 technology penetration 'low balls' cost by assuming low (ref. 2 table 3.8-19) penetration of PHEVs (0%) & BEVs (2.8%) while to comply manufacturers could opt for more Volts & LEAFs class vehicles so they could sell more 'guzzlers' these would raise the 'mix' cost and with the more weight of the 'guzzlers', mpgge would be less than EPA claim. [EPA-HQ-OAR-2010-0799-8041-A1, pp. 1-2]

Organization: National Association of Clean Air Agencies (NACAA)

Second, EPA projects the cost of new technology will add, on average, about $2,000 to the price of a MY 2025 vehicle. NACAA recognizes that consumers will recoup this cost through fuel savings. However, we believe that the average vehicle cost could be brought down if cleaner vehicles were introduced earlier. If vehicles equipped with the technologies needed to meet MY 2025 emissions and fuel economy requirements are introduced earlier, then by 2025 the projected additional cost should be lower than $2,000. In addition, early introduction of cleaner vehicles will provide added assurance that the projected fleet performance is achieved by 2025. Measures that lead to greater penetration of cleaner vehicles earlier in the program could bring down vehicle costs in later years of the program. Further, zero-emission vehicles and alternative-fuel vehicles would help to further reduce criteria pollutant emissions as well as GHGs. [EPA-HQ-OAR-2010-0799-8084-A1, pp. 3-4]

[These comments were also submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 36.]

Organization: National Automobile Dealers Association (NADA)

The proposal is drafted in a manner that makes it difficult to tease out the per vehicle costs associated with compliance. There are several reasons for this:

1. As with all estimates made in the proposal and in supporting documents, NHTSA and EPA struggle to forecast costs based on assumptions involving vehicles that will hit the market 5 to 13 years out into the future. Given the potential for extreme variability for any number of factors, MY 2017-2025 predictions of average per vehicle cost/price are inherently suspect.[EPA-HQ-OAR-2010-0799-9575-A1, p. 3]

2. Each agency uses different models to calculate different and, in some cases, a variety of average per vehicle costs that do not mesh well together. This is just one example of why the so-called 'single national program' is a misnomer. The final rule should harmonize and clearly delineate a single set of average per vehicle costs, for both light-duty cars and trucks, using only one marginal 'cost-to-consumer' number. NHTSA and EPA should strive to ensure that these cost figures accurately depict for prospective purchasers what the final rule will cost, on average. [EPA-HQ-OAR-2010-0799-9575-A1, p. 3]

3. The proposal and related fact sheets and press releases obfuscate cost projections. Instead of appropriately delineating costs, separately delineating benefits, and comparing the two, NHTSA and EPA go out of their way to emphasize gross and net benefits with little or no reference to costs. While by no means excusable, perhaps the unprecedented per vehicle and total costs have influenced EPA and NHTSA to do so. Regardless, the final rule should clearly show the average per vehicle costs prospective consumers should expect to have to pay up front. [EPA-HQ-OAR-2010-0799-9575-A1, pp. 3-4]

For purposes of understanding how the proposal will impact prospective new vehicle purchasers, these comments use the average per vehicle estimates NHTSA has set out in the proposal, adjusted to 2010 dollars. Moreover, NADA takes the position that the MY 2011, 2012-2016, and 2017-2025 standards constitute a single post-EISA program. Thus, for purpose of its analyses, NADA characterizes the government's total average per vehicle cost estimate to be $2936 (in 2010 dollars), reflecting $91 dollars for MY 2011 adjusted to $95, $903 for MY 2016 adjusted to $945, and $1876 for 2025 adjusted to $1896. [EPA-HQ-OAR-2010-0799-9575-A1, p. 4]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 72-74.]

By EPA's own estimates, current prices would go up over today $3,200. I heard different numbers thrown around, but a third of that are the mandates that are just now going into effect through 2016 and then another $2000, or a little over 2,000 on the mandates from 2017 to 2025, which will total in today's dollars $3,200 over today's prices. This would raise payments between $60 and $70 a month in a typical automobile loan.

A study that the NADA will release next month will raise significant concerns regarding how the proposal calculates retail price impacts. By using a more realistic analytical approach, our initial analysis shows the proposal underestimates the cost at retail and suggests a compliance-related price increase in my showroom could be at least 60 percent higher than that which would be up to $5,000 increase.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 53-55.]

Totaling the administration's final and proposed fuel economy mandates results in an average vehicle cost increase of at least $3,200, a substantial amount that every new car buyer will have to pay up front. As Don Chalmers explained last week, NADA believes that the actual total increase will be even higher. Thus, customers who come into my showroom in 2025 will face vehicles that, as a result of these rulings, are dramatically more expensive than they are today.

Moreover, the U.S. Energy Information Administration finds that this proposal will regulate out of existence the most affordable cars on the market today. Adjusting for inflation, the Energy Economic Information Administration claims that in 2025, there will no longer be new vehicles on the market costing $15,000 or less. These are the vehicles I sell to smart frugal buyers, college students and working families. How can a rule that eliminates the most affordable new cars on the market be pro-consumer? You're right; it's not.

Organization: Ross, D.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 241-242.]

Critics see the new standards as a formula for sticker shock. With price increases of $2,000 to $3,100, making automobiles unaffordable for low income consumers.

Well, history demonstrates that initial estimates of the cost of complying with new environmental standards have proven grossly exaggerated as human ingenuity, when facing the proper incentives, finds novel cost-effective solutions.

But suppose those purchase price estimates are accurate, at current, gasoline prices, the savings and lower fuel costs over the lifetime of the vehicle would be approximately $6,000.

Organization: Steyn, R.

* Clearly, the proposed two-fold increase in CAFE standards is a “drastic” action that will likely increase the cost of a new car by $5,000—$6,000. [EPA-HQ-OAR-2010-0799-8724-A1, p. 2]

Response:

The API questions EPA’s estimates of consumer savings resulting from lower fuel expenditures. They correctly point out that the savings as calculated in our analysis depend on the discount rate used. EPA has shown savings using both a 3% and a 7% discount rate. These discount rates are generally accepted rates at which social costs should be discounted. Clearly, using a higher discount rate as suggested by API would result in lower present value fuel savings. The goal behind our payback analysis was to shed light on the real situation rather than attempting to determine how consumers might value future savings versus current and/or future costs. While inflation in recent years has been extremely low, inflation in the 3-7% range is not atypical. Inflation in the 15% range, in the United States, is not typical. Therefore, we do not agree that discounting future fuel savings at 15% as the commenter recommends would be more appropriate than what we have done. In the end, the point of our payback analysis is not to shed light on when consumers would perceive the future savings to outweigh their costs, but rather to shed light on when those savings actually would outweigh their costs. Lastly, we disagree that our standards may have any negative impact on the ability of consumers to purchase the size of vehicles with the performance, utility and safety features that meets their needs. The agencies’ cost estimates include the costs of preserving all of the utilities of the present vehicle fleet. See. e.g. EPA RIA pp. 1-39 to 40. We believe that the compliance path we have shown maintains utility of the existing fleet (with two limited exceptions as discussed in Chapter 1.3 of our RIA) and maintains the safety characteristics of today’s fleet as discussed in section II.G of the preamble and in Chapters 3.4 and 4.4 of our RIA. Regarding octane requirements, we address octane-related issues in section 11.2 of this Response to Comments document.

Regarding comments from BMW, we do not disagree that BMW’s costs are likely to be higher than the average. In fact, our analysis shows a 2025MY cost of $1910 for BMW, or $74 higher than the average. Our analysis also shows a 9% full EV penetration rate for BMW, versus the average penetration rate of 3%. While BMW might argue that those results suggest a BMW-fleet utility considerably lower than their current utility (since full EVs, in our analysis, have a 75 to 150 mile range versus the typical gasoline vehicle range of roughly 400 miles), we suggest that buyers of full electric BMWs are likely to purchase the full EV despite the shorter range for reasons other than utility (i.e., status, prestige, environmental stewardship, etc.). Therefore, we do not believe that those BMW buyers will perceive any loss in expected utility.

Regarding the Consumer Federation of America, we have not studied the average cost increase of new vehicles over the past 15 years, so we will not comment on the claim that cars have increased $500 per year for 15 years. However, we do not ascribe unthinkingly to the comment that the cost of the final standards is a "small price to pay for extra fuel economy and extra savings." In fact, an average $1800 cost increase is not a small price to pay. Many commenters have expressed considerable concerns with the costs and we do not want to suggest that it is insignificant. Instead, we want to focus on the net impact which shows that there will be considerable social benefits that result from the final standards, these benefits vastly outweigh the rule's costs, and the fuel savings of the rule pay back the increased vehicle costs in a comparatively short time. We will all pay more for future vehicles, but we will certainly enjoy the savings that we realize as a result.

Regarding the comment from Mr. Jackson, please refer to our earlier response to Mr. Jackson in section 18.2.

Regarding comments from NACAA, please refer to our earlier response to NACAA in section 18.2.

Regarding the comments from NADA, we agree that there is uncertainty in our cost analysis given the long timeframe between now and 2025. For that reason, we have conducted several sensitivities surrounding costs and have found that the standards are very cost beneficial in each of our sensitivity cases as well as in our primary analysis. We present this sensitivity analysis in Chapter 3.11 of the RIA. NADA also suggests that EPA and NHTSA should use one marginal cost-to-consumer number and that, by not doing so, calling the rules a single national program is a misnomer. We disagree with this assertion. In fact, each agency has a different set of requirements to meet due to the different statutes that provide authority to each agency. NHTSA has a model that helps them estimate costs and benefits within the constraints of its statute. EPA has a model that helps it do the same. In fact, the estimated costs by each agency, using its respective models and analytic techniques, are corroborative. EPA believes that these corroborative analyses makes the overall conclusions more robust (and not in some way weaker, as the commenter would have it). We note further that the costs estimated by each agency will inherently be different for several reasons but, most notably, because NHTSA's standard does not reflect the full array of AC-related improvements that EPA's does, and EPCA/EISA allows manufacturers to pay fines rather than comply with the standards. Compliance is mandatory under the Clean Air Act. However, even though manufacturers will not be able to pay fines to comply with EPA standards (so that the ability to pay fines under the CAFE program becomes of no practical consequence), NHTSA still analyzes its program as though those fines will be paid.

As for NADA's claims that we have obfuscated cost projections, focusing only on benefits, we simply do not understand. Far from hiding or disguising costs, there are many prominent tables throughout the preamble and each agency's RIAs that clearly present the costs of the programs. Nor are those costs aggregated in a way making it harder to evaluate individualized impacts. EPA has estimated technology penetration and associated costs for each manufacturer, for example. See e.g. preamble tables III-25, 28, and 29.

Regarding the $2936 cost claimed by NADA for the three recent fuel consumption and GHG reducing rules, again we disagree. In addition, even if (against our view) we accept that it is appropriate to aggregate the different rules' costs here, NADA has made a number of factual errors in doing so. We have estimated the 2025MY reference case costs (i.e, the cost to meet the 2016 standards in the 2025MY) at $719 (see RIA Table 3.6-1). We have also estimated 2025MY control case costs (i.e., the cost to meet the 2025 standards in the 2025MY) at $1836 (see RIA Table 3.6-3). The total cost of the two rules would then be $2555, or $381 lower than that suggested by NADA. In fact, the $719 value actually includes costs to meet NHTSA's MY2011 standards in MY2025. To clarify, in the MYs 2012-2016 final rule, we estimated the cost to meet the MY2011 standard in MY2016 at $89 (2007$) (see EPA-420-R-10-009, Table 4-6 at page 4-18) which would probably be on the order of $50-$70 (2010$) for meeting the MY2011 standard in MY2025. Therefore, the $2555 value stated here is slightly high since it already includes the costs of meeting the MY2011 standard in MY2025. In adding their costs, NADA has inappropriately added the costs presented in each of the rulemakings they mention. However, the cost they used for the MYs 2012-2016 rule, or $903 adjusted to $945, is the cost of complying with the 2016 standards in the 2016MY, not the 2025MY. To properly add the costs, one needs to use the cost of the 2016 standards in the 2025MY as we have done here. Curiously, NADA does not suggest adding together the cumulative benefits of these standards, which again vastly outweigh the standards' cumulative costs.

Regarding NADA's comments on calculating retail price impacts, please refer to our earlier response to NADA in section 12.3.2. Regarding NADA's claims about lower priced vehicles and the ability of frugal buyers, students and working families to afford new cars, we have a response to that argument in section 18.7.1, below.

Regarding comments from David Ross, EPA would like to thank Mr. Ross for his comments and interest in our rule. As explained in section III.H.11 of the preamble, EPA agrees that vehicles in the low-priced (economy-class) segment will bear technology costs needed to meet the new standards, but it is not known how manufacturers will decide to pass on these costs across their vehicle fleets, including in the low-priced vehicle segment. If manufacturers decide to pass on the full cost of compliance in this segment, then it is possible that consumers who might barely afford new vehicles may be priced out of the new-vehicle market or may not have access to loans. However, the rule's impacts on availability of loans are unclear, because some lenders do factor fuel economy into their loans, and it is possible that this trend may expand. In addition, as the Union of Concerned Scientists comments, auto makers have some flexibility in how both technologies and price changes are applied to these vehicles; auto makers have ways to keep some vehicles in the low-priced vehicle segment if they so choose. Though the rule is expected to increase the prices of these vehicles, the degrees of price increase and the impacts of the price increases, especially when combined with the fuel savings that will accompany these changes, are much less clear. See also responses in section 18.7.1 below.

Regarding comments from Ruth Steyn and Mark Cuenca, we disagree that the rule will result in new car costs increasing $5000-$6000 as made clear in the response to the NADA comments above, and in our response in section 12.3, above.

18.2.2. Annual Aggregate Costs

No Comments received on this topic.

18.2.3. Consumer Payback Analysis

Organizations Included in this Section

Consumer Federation of America (CFA)
Consumer Reports
Consumers Union
Defour Group LLC
Delphi Corporation
Environmental Defense Fund (EDF)
International Council on Clean Transportation (ICCT)
National Automobile Dealers Association (NADA)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
U.S. Chamber of Commerce
Volkswagen Group of America

Organization: Consumer Federation of America (CFA)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 40.]

Household gasoline expenditures set a record in 2011 reaching an average of over $2,850 per year which means that gasoline expenditures were 40 percent higher than expenditures on home energy, electricity, natural gas and heating oil. Ten years ago gasoline expenditures were 13 percent lower than home energy and that is why consumers are so troubled by gasoline prices.

But rising gasoline prices have also changed the structure of the cost of driving. Ten years ago the cost of owning a vehicle as reported in the consumer expenditure survey was the largest single component of the cost of driving by far, about three times as high as the cost of gasoline. In 2011 the cost of gasoline will equal or exceed the cost of ownership in the consumer expenditure survey. This is an entirely new automobile market.

IV. CONSUMER POCKETBOOK IMPACT: THE PROPOSED FUEL ECONOMY STANDARDS WILL PROVIDE SIGNIFICANT CONSUMER COST SAVINGS

The impact of the standards on consumers can be measured in a variety of ways – pocketbook cash flow, vehicle net benefit, and simple payback periods. By every consumer impact measure, the standards deliver substantial benefits to consumers. [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

As Exhibit S-4 shows, for the typical consumer who purchases a new auto that complies with the 2025 standard with a five year auto loan, the higher fuel economy lowers the cost of driving from the first month because the reduction in gasoline expenditures is greater than the increase in the monthly payment to cover the cost of fuel saving technology. [See Exhibit S-4 on p. 6 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

At the end of the auto loan, the consumer will have saved an average of about $800.

By the tenth year, the vehicle will have generated an average of over $3,000 in savings, which means resale values are likely to be much higher, by $1,000 to $2,000.

Simple payback periods for new cars are less than three years; for new trucks, it will be less than two. [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 39.]

Higher fuel economy standards lower the cost of driving from the first month. They are cash flow positive because the reduction in gasoline expenditures is greater than the increase in the monthly payment to cover the cost of fuel saving technology. At the end of the auto loan the consumer will have saved an average of $800. By the tenth year the vehicle will have generated an average of over $3,000 in savings. Therefore, the resale value of the vehicle is likely to be much higher.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 89.]

Almost two-thirds of respondents support a 60-mile per gallon standard as long as the payback period is within three to five years. And that is the case with these standards.

There are several flaws in quantitative analysis that cause the agencies to seriously underestimate the value of higher fuel economy standards. We have pointed out these flaws in past analyses. [EPA-HQ-OAR-2010-0799-9419-A1, pp. 12-13]

- The rebound effect should not be included in the consumer pocketbook analysis.

Organization: Consumer Reports

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 167.]

Most are willing to pay extra for the extra fuel economy if the payback is -- will mean a lower overall cost of that vehicle over five years.

Organization: Consumers Union

Once fully implemented, the standards will save most car buyers money in the very first month of ownership. According to CNW Marketing Research, approximately two-thirds of new car buyers finance their new vehicle purchases with an average five-year loan.[4] Because average monthly fuel savings is greater than the additional monthly payment from a higher purchase price, consumers start saving right away. For car buyers who pay cash for a new vehicle, the payback period is less than four years, even with EIA's modest fuel price projections. Although consumers will be paying slightly more money for more efficient vehicles, they will more than recover this investment through savings at the pump. [EPA-HQ-OAR-2010-0799-9454-A2, p.2]

---

4 - According to CNW Marketing Research, 67.38% of new-car purchases were financed in 2010. The average length of time for a new car loan in November 2011 was 57.22 months. See Appendix B CNW Marketing Research on Financing Data and Appendix C CNW Marketing Research on Payment Type for data tables.

Organization: Delphi Corporation

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 110.]

Third, this rulemaking will enable the consumer to experience the inherent value of technologies that have a reasonable payback period.

Organization: Environmental Defense Fund (EDF)

C. PAYBACK PERIOD

EDF supports the use of a 5-year or greater payback period as an input to estimate the value of fuel economy improvements to potential vehicle buyers. A payback period of anything less than 5 years would not accurately reflect the current and forecasted buying trends of consumers. In 2010, consumers owned vehicles for an average of 63.9 months, or just over 5 years.19 The average length of ownership of new vehicles has been on a steady rise since the economic and auto industry downturn in 2008 and is expected to continue to rise. 20 Therefore, the period of time that potential vehicle buyers can be assumed to value fuel economy improvements in making their purchasing decisions may also be increasing. For this reason, we strongly urge the Agency to use a payback period that accurately reflects the forecasted purchasing behavior of consumers. [EPA-HQ-OAR-2010-0799-9519-A1, p. 8]

Organization: National Automobile Dealers Association (NADA)

IV. THERE IS A NEED FOR ADDITIONAL CONSUMER INFORMATION ON LOWER OPERATING COSTS AND FUEL ECONOMY 'PAY-BACK'

Prospective purchasers able and willing to consider buying new vehicles covered by the proposal could benefit from additional information designed to enable them to better understand the value of investing in fuel economy performance. Current EPA/NHTSA fuel economy labels provide prospective purchasers with the tools necessary to make good comparisons between new vehicles, and between new and used vehicles. NADA is engaged with EPA on how best to use this tool to educate interested prospective purchasers on comparative fuel economy performance. In addition, dealers work with the Department of Energy to make available to consumers the annual DOE/EPA Fuel Economy Guide. In additon, a wealth of useful information is found on fueleconomy.gov and on other non-governmental websites devoted to the topic. [EPA-HQ-OAR-2010-0799-9575-A1, pp. 9-10]

Section 105 of EISA specifically directed DOT, in consultation with DOE and EPA, to implement a vehicle fuel efficiency and alternative fuel consumer education program. Pursuant to that mandate, NADA urges NHTSA to exercise its authority to collect annually from vehicle manufacturers, and to make available to the public, the actual cost of compliance with the so-called 'National Program' for each make, model, and powertrain. This key piece of information, not currently available, will enable prospective new vehicle shoppers to conduct a pay-back analysis for each new vehicle they are considering by measuring actual compliance costs against potential fuel savings. The availability of actual compliance cost data also will assist NHTSA and EPA with determining how best to make further modifications to the 'National Program' so as to improve its effectiveness. In short, enabling the transparency of actual compliance cost data will help to maximize the efficiency of consumer fuel economy decision making and to maximize net regulatory benefits. [EPA-HQ-OAR-2010-0799-9575-A1, p. 10]

The final rule should assume that, at most, buyers value any fuel savings associated with the purchase of a new motor vehicle over a five-year period. As discussed above, except in rare instances of high and increasing fuel prices, consumers who view fuel economy as an important purchase criteria will be hard pressed to make the case for buying a more fuel efficient new vehicle if the up-front capital costs associated with doing so cannot be recouped in short order. [EPA-HQ-OAR-2010-0799-9575-A1, p. 10]

The benefits analysis used in the proposal uses an oversimplified pay-back method that overstates potential fuel economy savings. Instead, for purposes of calculating any 'pay-back,' real-world finance, opportunity, and additional maintenance costs should be accounted for. In other words, the final rule should evaluate its potential impact on a vehicle’s total cost of ownership. An example of such a calculator is found at http://www.nadaguides.com/Cars/Cost-to-Own. NADA would welcome the opportunity to discuss further with EPA and NHTSA how prospective purchasers of new light-duty customers would be better served by a total cost of ownership approach to understanding a given vehicle’s future costs of operation. [EPA-HQ-OAR-2010-0799-9575-A1, p. 10]

Dealers will continue their efforts to educate consumers on how best to make fuel efficient purchases, and on how actual mileage may vary from that set out on Monroney labels. Through efforts such as NADA’s Green Campaign (http://www.nada.org/green), dealers also will continue to educate customers on how to maximize in-use fuel economy performance. [EPA-HQ-OAR-2010-0799-9575-A1, p. 10]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 94-95.]

Proponents of the model year 2017 through 2025 proposal assert that higher upfront costs will pay back for purchases of the -- in the form of fuel cost savings.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

A consistent Consumer Federation Poll released in September of 2010 also showed consumers are willing to pay more for greater fuel efficiency. A majority (62 percent) were willing to pay more for efficiency if they recovered the added cost with a five-year payback period.6 [EPA-HQ-OAR-2010-0799-9549-A2, p. 2]

A more recent study by Deloitte reveals that Generation Y consumers show a strong preference for electric vehicles and hybrids and will pay more for these advanced technology vehicles. A strong majority (56 percent) prefer an electric vehicle over any other type of vehicle, while almost half (49 percent) said they would pay $300 for each mile per gallon of fuel economy improvement that a hybrid gets over a traditional model.7

The above mentioned polls and the Deloitte study support the agencies' use of a 5 year pay back for the cost of technologies using a 3 and 7% discount rates. Significantly, the agencies find that consumers who use a standard 5-year loan to purchase a new vehicle will begin saving they when the drive off the lot, with monthly savings at the pump exceeding the increased loan payments associated with fuel saving technologies by $12 per month (or more).

6 http://consumerfed.org/pdfs/Consumer_Savings_Survey_Fact_Sheet092710.pdf

Organization: Volkswagen Group of America

An implication of the lack of cost parity is the impact on consumer payback. The agencies state that an average consumer will face just less than 4 years to achieve pay-back on the higher upfront investment. Clearly the payback time for a consumer purchasing a passenger car will be longer than a consumer purchasing a light truck, especially a larger pick-up. While Volkswagen has not directly calculated what the expected implication could be on a consumer evaluating two vehicles with different payback periods, it would seem anecdotally that in most cases the consumers would tend towards the shorter period. [EPA-HQ-OAR-2010-0799-9569-A1, p. 10]

Organization: U.S. Chamber of Commerce

EPA states that the new rules will save consumers money under three scenarios: (1) the vehicle is driven by one owner for its entire life span; (2) the customer pays cash and keeps the vehicle for at least four years; or (3) the customer finances the car with a five-year loan and keeps the car for at least those five years. EPA appears to imply that anyone in a typical two-, three- or four-year lease will pay more for their vehicle as a result of the new fuel economy standards. EPA also appears to imply that anyone purchasing a vehicle with a loan that lasts less than five years will pay more for their vehicle as a result of the new fuel economy standards. [EPA-HQ-OAR-2010-0799-9521-A1, p. 2]

A large swath of the car buying public—i.e. anyone owning or leasing a new car for less than four years—will therefore be exposed to higher vehicle costs as a result of the proposed rule. Given that the driving force for this rule is fuel economy, if consumers are unwilling or unable to pay the added cost for this benefit, EPA and NHTSA must be prepared to make changes to the program. [EPA-HQ-OAR-2010-0799-9521-A1, p. 2]

Response:

Regarding comments from CFA, we agree that consumers will save money due to the final standards through decreased fuel expenditures despite the higher new vehicle costs. Furthermore, we do not include rebound miles driven in our consumer payback analysis, although we do include rebound miles driven in our benefit-cost analysis. We present our consumer cost of ownership (payback) analysis in section III.H.5 of the preamble and in Chapter 5.5 of EPA's final RIA.

Regarding the comments from Consumer Reports and Consumers Union, our analysis shows that the payback period will indeed be within 5 years for the average new vehicle purchase (3.3 years using 3% discounting and a cash purchase). For credit purchases, the savings being in the first month as the fuel savings outweigh the increased loan payments assuming a 5 year loan at average national loan rates. We present our consumer cost of ownership (payback) analysis in section III.H.5 of the preamble and in Chapter 5.5 of EPA's final RIA.

We addressed the concerns expressed by the Defour Group in our section 18.1 responses to the Defour Group.

We agree with the Delphi Corporation that the rule will enable the consumer to experience in inherent value of technologies that have a reasonable payback period.

EPA would like to thank the Environmental Defense Fund for their comment and interest in our rule.

Regarding comments from NADA, that NHTSA should collect annually and make available to the public the actual cost of compliance with the National Program for each make, model, and powertrain, EPA doubts this could be done. It is one thing to require industry, any industry, to make available its costs of doing business—this is required by the Security and Exchange Commission for all public companies—but quite another to require that information at the product level. What NADA suggests is akin to requiring Apple to make available to the public the cost of producing a single iPad or iPhone. While no doubt interesting to the consumer, such information is among the most closely guarded information within most public companies. Further, it would require each auto maker to make available to the public their pricing strategy for each of their vehicles. Regarding the time period over which consumers value fuel savings, we note that our OMEGA model runs calculate fuel savings, and discount those fuel savings, over a five year period, consistent with NADA's recommendation. Our payback analysis shows a 3.3 year payback, on average, for 2025MY cash purchases. Regarding what NADA considers our oversimplified payback analysis, we note that our final payback analysis includes increased maintenance costs as the commenter suggested (as well as sales taxes, financing costs for credit purchases and increased insurance costs on the more valuable vehicles, again consistent with the commenter's suggested approach).

Regarding comments from the Sierra Club, et al, we agree that a five year payback period, as mentioned above in our response to NADA, is the appropriate period to use within OMEGA when determining the packages of technologies that are most appropriate for achieving compliance.

Regarding the comment from Volkswagen that the payback period for cars will be longer than for trucks, VW appears concerned that comparison shoppers will gravitate toward the shorter payback periods (trucks) and away from the longer periods (cars). Being largely a car maker for the US market, this would be a concern for VW. However, the comment implies that potential car buyers are comparison shopping against trucks and vice versa. It seems just as probable, if not more so, that potential car buyers are shopping for a car while potential truck buyers are shopping for a truck. As such, their comparisons would be within class and not across class, at least for the most part. Nonetheless, while VW admits that they have not done the calculations to know whether paybacks are longer or shorter for cars versus trucks, we have. As noted, our payback period for a 2025MY cash purchase of the average vehicle is 3.3 years. For a 2025MY car, the payback would be 3.5 years, and for a truck would be 3.2 years. We doubt that such a comparison would drive a potential car buyer to a truck since, despite a shorter payback period, the overall fuel costs would presumably be higher for the truck than the car. But, we leave it to VW to understand their potential customers.

Regarding comments from the U.S. Chamber of Commerce, there appears to be a misunderstanding with respect to our payback, or consumer cost of ownership, analysis. In fact, we fully acknowledge that MYs 2017-2025 vehicles are expected to have increased costs as a result of this rule, and that those costs will be borne in part or in total by the purchasers of the vehicles. The terms of the purchase do not matter in that respect – cars and light trucks are expected to cost more regardless of purchase option. Our analysis was meant to highlight that, despite the higher costs, consumers would actually save money through reduced fuel expenditures. The point at which the savings outweigh the costs is when we consider the savings to have "paid back" the increased costs. Since the cost side of the calculation varies depending on the purchase option – cash vs credit via 5 year loan vs credit via 4 year loan vs lease vs etc. – we chose to focus on what seemed to be the most prevalent purchase options. Those options being cash purchase and credit purchase via 5 year loan. Focusing on those two purchase options should not be interpreted as meaning that purchasers choosing other purchase options will not experience the same fuel savings and/or nearly the same net savings.

18.3. Analysis of Reduction in Fuel Consumption and Resulting Fuel Savings

<u>Organizations Included in this Section</u>

Alliance of Automobile Manufacturers
American Council for an Energy-Efficient Economy (ACEEE)
American Petroleum Institute (API)
American Road & Transportation Builders Association (ARTBA)
BlueGreen Alliance
Consumer Federation of America (CFA)
Consumers Union
E100 Ethanol Group
Environmental Consultants of Michigan
Environmental Defense Fund (EDF)
Jackson, F.W.
Mass Comment Campaign (20) (Union of Concerned Scientists-1)
Mass Comment Campaign (39) (Unknown Organization)
National Association of Clean Air Agencies (NACAA)
National Automobile Dealers Association (NADA)
Natural Resources Defense Council (NRDC)
Northeast States for Coordinated Air Use Management (NESCAUM)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Smith, G.

Organization: Alliance of Automobile Manufacturers

The importance of gasoline pricing (including tax policy) cannot be underestimated, particularly for the post-MY 2020 timeframe, when policy makers are counting on a rapid transition to non-petroleum transportation fuels. The report from Resources for the Future noted that “it is an open question whether carbon prices at the levels currently under discussion will be sufficient, by themselves, to bring ‘new’ fuel efficiency technology into the marketplace.” Yet the Energy Information Administration projects that fuel prices will be relatively stable over the next 15 years, with gasoline prices rising by less than 4 cents per year. [EPA-HQ-OAR-2010-0799-9487-A1, p.19]

What Impact are the New Requirements Having on Government Revenues and How Are Governments Responding? [EPA-HQ-OAR-2010-0799-9487-A1, p.20]

As gas tax revenues decrease due to rising adoption of electric vehicles (EVs) and improved fuel economy, both the federal government and the states will need to determine how to address budget shortfalls resulting from falling gas tax revenues. In February 2009, the National Surface Transportation Infrastructure Financing Commission released a study recommending a shift from the present reliance on federal fuel taxes to fund federal surface transportation programs to a federal funding system based on more direct forms of ‘user pay’ charges, in the form of a charge for each mile driven (commonly referred to as a vehicle miles traveled or VMT fee system). [EPA-HQ-OAR-2010-0799-9487-A1, p.20]

Recently, certain states have been considering a vehicle miles traveled (VMT) tax or an annual registration fee on EVs as an alternative method to raise revenue for the state’s transportation system. Legislation has been introduced in several states attempting to recover these lost tax revenues. State legislators in Arizona, Washington, Oregon, Texas, Indiana and Mississippi have attempted to address declining revenues with bills that would place fees (i.e., a road usage charge) on EVs, and in some cases, hybrid motor vehicles. States are expected to intensify such efforts to maintain their transportation infrastructure in light of these declining gas tax revenues. If states begin to enact such legislation, the agencies will need to evaluate how this could impact consumers' willingness to invest in advanced technology vehicles. [EPA-HQ-OAR-2010-0799-9487-A1, p.20]

Organization: American Council for an Energy-Efficient Economy (ACEEE)

RECOMMENDATIONS

Include an estimate of the impact of the rule on vehicle sales. Use the approach taken for the 2012-2016 rule unless a better approach is available.

Include economic benefits of the decline in fuel price as a result of the rule. [EPA-HQ-OAR-2010-0799-9528-A2, p.2]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 109-110.]

We concur with the agencies' assessment that in order to thrive in the global automotive market, domestic manufacturers will need to invest consistently in technologies to improve fuel efficiency. We believe that the standards now proposed can help achieve that outcome. And in our testimony, we make three points:

First, that there is a huge potential for cost-effective investments in energy efficiency improvements across all sectors of the economy.

So what is that potential for cost-effective efficiency improvements? In a report we released two weeks ago titled, The Long-Term Energy Efficiency Potential; What the Evidence Suggests, we show that by investing in greater levels of energy productivity, we can slash the nation's energy use by 40 to 60 percent by the year 2050 as we create nearly 2 million more jobs and save the equivalent of $2600 per household annually across all sectors of the economy.

Second, fuel economy standards are a critical first step in capturing the full economic potential.

And third, promoting these standards will be good for jobs, even as the fuel economy improvements will save household consumers and businesses money that almost immediately will be respent in the broader economy.

How do fuel standards then become a critical step in that economic performance? Anytime we can promote cost-effective alternatives to the current pattern of technologies and services, the productivity of the economy is improved. And the evidence here suggests that improved fuel economy provides a significantly improved alternative to the purchase of gasoline. Drawing on data from EPA/NHTSA, we estimate that in constant 2009 dollars that efficiency might cost on the order of 50 cents to $1.20 per gallon of gasoline equivalent compared to the 4, 5 or 6 dollars per gallon of gasoline we may have to pay in the year 2025.

Organization: American Road & Transportation Builders Association (ARTBA)

ARTBA appreciates both EPA and NHTSA's goals of decreasing emissions generated by the burning of fossil fuels in automobile usage. There is already a well-documented history of reductions in fossil fuel emissions occurring through advances in automotive technology. According to the EPA, fuel economy is up 61 percent since 1975. [EPA-HQ-OAR-2010-0799-9403-A1, p. 1]

In 2009, the average personal vehicle got 21.1 miles per gallon, while its 1975 counterpart only managed 13.1 miles per gallon.1 As America's fleet of vehicles become more and more fuel efficient, they will become less and less carbon emitting. For example, tighter fuel economy standards proposed in May 2009 by the Obama Administration will reduce vehicle greenhouse gas emissions by an estimated 900 million metric tons between 2012 and 2016. This is the equivalent of removing 177 million tons of today's automobiles from the nation's roadways.2 Additionally, CO_2 emissions are down 38 percent since 1975: A 2009 model car or light-duty truck (SUV, minivan, pickup) generates 422 grams of CO_2 per mile compared a 1975 model car, which emitted 679 grams per mile.3 [EPA-HQ-OAR-2010-0799-9403-A1, p. 2]

Further, data from the U.S. Environmental Protection Agency (EPA) and the Federal Highway Administration (FHWA) shows substantial progress towards emissions reductions in a growing economy. According to both agencies, despite substantial gains in population, employment, gross domestic product (GDP), number of drivers, number of vehicles, and vehicle miles traveled (VMT) since 1970, the nation's air quality has improved. Specifically, over the same time period, the transportation sector has reduced volatile organic compounds (VOCs) by 73 percent, nitrous oxides (NO_x) by 41 percent, particulate matter (PM) by 50 percent, and carbon monoxide (CO) by 62 percent. NO_x and VOCs are precursors to ozone and associated with GHGs and climate change. As levels of VOCs and NO_x continue to decrease, so will ozone and GHGs. [EPA-HQ-OAR-2010-0799-9403-A1, p. 2]

ARTBA supports efforts to reduce emissions and improve fuel economy. It is inappropriate, however, to promulgate such proposals without acknowledging and attempting to mitigate the adverse effect they would have on other areas of federal responsibility. ARTBA is particularly concerned with the potential effect of EPA and NHTSA's proposed rule on revenues generated for the Highway Trust Fund (HTF). The HTF was created in 1956 as an investment construct by which users of the national highway infrastructure are charged a direct user fee to maintain and improve the system on which they rely. Currently, 18.4 cents are directed to the federal HTF from each gallon of gasoline purchased and federal highway investment accounts for 45 percent of the national capital investment in highway and bridge construction. [EPA-HQ-OAR-2010-0799-9403-A1, p. 2]

As fuel efficiency has increased and innovations in automotive technologies have progressed, revenues into the HTF have been negatively impacted. These positive developments in reducing the motor fuel usage, however, do not have to be inconsistent with the goal of meeting the nation's transportation infrastructure needs. Unfortunately, policymakers in the legislative and executive branches have not increased the per gallon rate of the federal motor fuels user fee since 1993 and as a result the revenues flowing into the HTF and their corresponding purchasing power has fallen further behind the documented needs of the nation's surface transportation system. This problem affects the amount of funding that all 50 states receive from the federal government to build and maintain their transportation infrastructure. [EPA-HQ-OAR-2010-0799-9403-A1, p. 2]

To illustrate the magnitude of the effect of the proposed CAFE Standards on HTF revenues, ARTBA has attached a memo which was distributed to Congress on July 28, 2011. According to ARTBA's research, the proposed CAFE standards will result in a loss of $75,651.7 million dollars through the year 2025. At a time when the nation is struggling to find funding for long term solutions to pay for pressing transportation infrastructure needs, this kind of cut in HTF revenues could put the nation's entire transportation program in jeopardy. [The memo can be found on p. 4 of Docket number EPA-HQ-OAR-2010-0799-9403-A1] [EPA-HQ-OAR-2010-0799-9403-A1, pp. 2-3]

ARTBA encourages the development and use of more energy efficient vehicles and supports the EPA and NHTSA proposal to raise the CAFE standards. This proposal, however, should be expanded to ensure it does not dilute existing or future federal HTF revenues. This adjustment could include an increase in the federal motor fuels tax or some other method of generating federal revenues that will accurately capture the benefit received by users of the system and protect against the effects of inflation, increases in construction costs, and advances in fuel efficiency. [EPA-HQ-OAR-2010-0799-9403-A1, p. 3]

---

1 Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2009, U.S. Environmental Protection Agency, November 2009.

2 Obama Administration National Fuel Efficiency Policy: Good For Consumers, Good For The Economy And Good For The Country, May 2009.

3 Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2009, U.S. Environmental Protection Agency, November 2009.

Organization: BlueGreen Alliance

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 38-39.]

Some of the fuel savings created by the standard will go to cover the modest incremental cost of higher performing vehicles. This diversion of spending from fuel to vehicle improvements also has the effect of boosting job creation. This is because vehicle manufacturing is more labor intensive per dollar spent.

Organization: Consumer Federation of America (CFA)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 88-89.]

Seventy-five percent are concerned about gasoline prices and dependence on Mideast oil. They think it is important to reduce oil consumption. They support higher fuel economy standards as a good way to do so.

There are several flaws in quantitative analysis that cause the agencies to seriously underestimate the value of higher fuel economy standards. We have pointed out these flaws in past analyses. [EPA-HQ-OAR-2010-0799-9419-A1, pp. 12-13]

- The base case price of gasoline is too low. The Energy Information Administration has recently raised its estimate of gasoline prices by an average 30 cents per gallon. [EPA-HQ-OAR-2010-0799-9419-A1, p. 13]

Significant macroeconomic benefits of greater fuel economy have been ignored.

- A “price effect” must be included that recognizes that the reduction in U. S. gasoline consumption lowers the world price of crude substantially. This is a true (consumption) externality and the agencies have estimated its value at $0.30 per gallon, but failed to include it in the analysis.

Organization: Consumers Union

As noted in the analysis of the proposed rule, the benefits of the rule far outweigh the costs of compliance. The vast majority of the benefits are direct consumer benefits in the form of fuel savings, while the costs are primarily investments in deploying (and to some extent. developing) more efficient and alternative fuel technologies. In making its cost-benefit calculations, NHTSA relies on the Energy Information Administration’s (EIA) future forecasts of gasoline prices. Consumers Union notes that since 2004, actual oil prices were significantly higher than EIA’s five and ten year forecasts had predicted.[3] While it is not feasible for EIA to predict oil price shocks—such as the one we experienced in 2008—with any certainty, the risks and costs of price spikes are nonetheless very real and likely to occur again in the near future. Consumers Union expects that the consumer savings will be even greater than the sizable benefits predicted by the rule. [EPA-HQ-OAR-2010-0799-9454-A2, p.2]

---

3 - See Appendix A EIA Understimation of Oil Prices

Organization: E100 Ethanol Group

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 202.]

If fully implemented, this plan would save 12 billion barrels of crude oil over the 14-year period between 2012 and 2025. This represents only 26 percent of our crude oil imports for that time period. Thus, it is not possible to achieve crude oil independence by increasing CAFE alone.

Organization: Environmental Consultants of Michigan

As a further the drawback of CAFÉ policy, the proposed higher fuel economy standards would cost $76 billion in lost fuel tax revenue. [NHTSA-2010-0131-0166-A1, p. 3]

Organization: Environmental Defense Fund (EDF)

D. GASOLINE PRICE

Projected future fuel price is the key input in estimating the fuel savings to consumers and society, which accounts for the majority of the proposed program's benefits. Therefore, the agencies' choice of fuel price is very important as it impacts the perceived feasibility of the proposed program. For this proposed rule, the agencies use the most recent fuel price projections from the U.S. Energy Information Administration's (EIA) Annual Energy Outlook (AEO) 2011 reference case forecast. While we agree that the AEO is a very credible source for fuel price forecast, it is important to remember that forecasts are based on models, which are not crystal balls (i.e. there is always some amount of uncertainty). For example, the EIA's AEO2005 forecast for fuel prices for 2005 to 2010 underestimated actual prices over those six years on average by 31%.21 This illustrates the importance of the use of a sensitivity analysis with significantly higher gasoline prices. [EPA-HQ-OAR-2010-0799-9519-A1, pp. 8-9]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 173.]

With respect to economic security, combined again with the Phase 1 standards, the proposed rule will provide families with more than $8,000 in fuel savings over the lifetime of the new vehicle for a total of 1.7 trillion in national fuel savings over the life of the program.

Organization: Jackson, F.W.

"…no amount of domestic production could offset…."Increasing domestic production is a lengthy process, where I've seen it documented it says, and I accept, from start to 1st barrel is at least a decade. So, to have more domestic production available Bush would have to have initiated it over a decade ago. So, not Obama's fault until several more years have passed; if Republican's want to blame someone it's Bush and Congress of a decade ago. [EPA-HQ-OAR-2010-0799-11785-A1, p. 1]

"….little he could do in the short run to ease the pain at the pump" Let's change criteria to from what he can do to what could be done that he could speak out for and lead: Pain at the pump is more than posted price, e.g., drop ethanol mandate to lower per gallon price and require less gallons because a less ethanol content a gallon would have more btus. And there are others, some we have used before like reduced highway limits, politically very unpopular but would help (I do not recommend this but it is something that we could do). But the most important action would be to implement a program that moves us as fast as practical to implement cost-effective maximum efficient technologies – see more specifics starting on bottom of page 7 “Additional relevant comments” and continuing on page 8; and this he could/should do today, i.e., embark on lowest future cost and maximum efficiency , no smoke and mirrors fleet!! [EPA-HQ-OAR-2010-0799-11785-A1, p. 2]

“….US producing more oil than any time during the last eight years…” This comes from pre-Obama actions, i.e., not traceable to Obama actions.

“Neither he nor anyone else can do much about oil prices,…” He now, I accept, but statement to broad to be completely correct. Oil producers, e.g., Saudis, could increase production and lower price, i.e., they qualify as anyone else; and while Obama has very little he can do today with immediate price impact, he does have some, e.g., “lead” cut back on ethanol. And that is for today, there is much he can do to lower future price and price volatility, see below table on page 5. “……new fuel economy standards….average nearly 55 mpg by….” Some “smoke and mirrors” here. Question of how one calculates, i.e., if I take a NHTSA 97 mpgge Leaf with a 12 mpg guzzler I average (unweighted) 54.5 mpg but reality is if I take the gallons of gas equivalent vehicles weighted average I get 21.4 mpggev. Big difference and the one that matters is how many gallons, or ggeqv, in total to move the fleet, i.e., Govt always flashes the 54.5 (and reporters report), it sounds good but not reality as far as oil (the issue at hand) demand is concerned! Obama has tried but he is following his advisers (or handlers) and while making some future progress potentially not the max that Nation needs and could/should have. Potentially is a key word: true CAFÉ unweighted Target raised to 54.5 mpg: problem is with way calculated and big loophole for manufacturers (see above build one LEAF and you can build a “Guzzler”), and unweighted mpg calc, i.e., reality is: weighted calc more fuel required than advertised! [EPA-HQ-OAR-2010-0799-11785-A1, p. 2]

So, Obama has potentially moved the “goal posts” but with big “loopholes” which I expect will be used, otherwise why were they put in! Obama not an Engineer so he may really believe the 54.5, but what about NHTSA&EPA they have technical talent, why do they not tell him, or do they?? Anyway, here is what I calc for EPA 2025 Proposal with 36 BGals ethanol per year mandate fleet (see EPA references) vs. 2016 35.5 mpg: [EPA-HQ-OAR-2010-0799-11785-A1, p. 2]

2016 35.5 mpg E15 fuel: 23.17 total (to Nation) cents per mile 3.15 ggeq/100 miles, or 31.75 mpggeq EPA Proposal 2025 fleet 36 BGal ethanol per year: 23.56 total cents per mile and 2.24 gge/100 miles, or 44.6 mggeq, i.e., not 54.5; and at higher cost. [EPA-HQ-OAR-2010-0799-11785-A1, pp. 2-3]

EPRI with it’s 50% plugins: 29.71 total cents per mile and 2.36 ggeq/100 miles, or 42.4 mpggeq at much higher cost!

Max technologies with minimum ethanol no hybrids or plugins: 17.83 total cents per mile and 1.18 gg/100 miles, or 84.75 mpggev [EPA-HQ-OAR-2010-0799-11785-A1, p. 3]

Pretty clear plug-in and ethanol both very expensive and require more energy on-board vehicle (and in total) than Max (and or Min) technologies, e.g., EPRI with high plug-in % over the 174,000 mile life of a vehicle (vs. Max) of $ 20,671 added total cost per vehicle (and with an assumed Taxes & inflation 50 % pass throughs $ 31,007) – quite a load. Even EPA's Proposal case $ 9,970 added cost vs. Max (and with 50 % for Taxes & inflation pass throughs $14,955! And as I believe manufacturers will continue to find larger more powerful vehicles more profitable I believe EPA's proposal case cost understated and actual mpgge overstated. [EPA-HQ-OAR-2010-0799-11785-A1, p. 3]

Bottom line: while Obama has moved the goal posts on gge from 35.5 mpg, it is at added cost (and potentially much more added cost with methods of calc and/or plugins) with "smoke and mirrors" numbers offered while better alternatives (Mid, Max) available that reduce fuel demand far more while actually saving consumers & taxpayers a bundle! Obama needs to realize the problem is high cost and increasing cost more to Nation, as he is currently promoting, undefendable and is a lost cause if/when the truth gets out; better now than September & October. The President is on exceedingly treacherous thin ice and needs to move now while he has time to demonstrate a new much better for Nation direction; and 36 BGals ethanol was instituted in 2007 before he came to office; the longer Obama continues to promote 36 BGals, the more difficult disowning it will be. And removing the faulty 54.5 analyses & claims now with President orchestrating the information release rather than his adversaries next fall will be far less treacherous during November!!! And he needs to officially chastise NHTSA and EPA for faulty analyses and claims and openly send message he is not happy with Govt performance and wants full and "honest" information in the future from all Govt entities. [EPA-HQ-OAR-2010-0799-11785-A1, p. 3]

Otherwise he depends on the other candidate to look so bad that he still looks the better choice in November. "Drill baby drill" not a better alternative at least a decade for impact and probably inadequate price impact as world demand for oil increases and turmoil in producing areas continue and depletes our reserves at a faster rate, why speed up the date we run out?? And even though Obama's approach is better than "drill baby drill" the voters could be so blinded by unhappiness with Obama's performance in this area as to blindly opt for a change without rationally recognizing they will have two choices in November and unhappiness with continuing the one they have and are not happy with may get them to take a chance that I am confident they would later regret. [EPA-HQ-OAR-2010-0799-11785-A1, p. 3]

More information:

To:

EPA&NHTSA

1/27/12 Rev. D 2/18/12 [EPA-HQ-OAR-2010-0799-11785-A1, p. 3]

Subject: Updated (mainly at paragraphs at end Re: messages sent to oil exporters) comments on Docket ID Nos. EPA-HQ-OAR-2010-0799 and NHTSA-2010-0131 "2017 and Later Model

Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy" [EPA-HQ-OAR-2010-0799-11785-A1, p. 4]

Per my above table let's examine Govt proposal with 60 BGals corn ethanol vs. 2016 35.5 mpg standard using gasoline; and then compare against other options: Max technologies gasoline fueled. [See table on pp. 3-4 of Docket number EPA-HQ-OAR-2010-0799-8041-A1] [EPA-HQ-OAR-2010-0799-11785-A1, p. 11]

2016 35.5 CAFÉ gasoline fueled 20.98 cents/mile system 2.97 gg/100 miles. Vs. EPA proposal's E36 (36 BGals corn ethanol of 23.56 cents/mile and 1.41 gal gas/100 miles; or, at 174,000 lifetime miles deltas of 2.69 more cents/mile to reduce gasoline 1.56 gg/100 miles. Doing the math (includes backing out the 20 % fuel discount to get $s we are used to seeing, i.e., about $100/brl): lifetime gasoline reduced but at a cost of $ 1.72 more per gal reduced; adding in the $3.00 for gasoline yields $ 4.72 per gallon to drive vehicle. $ 4.72 equates to $ 198 per brl gasoline or about $ 168 per brl crude offset. Wrong message to oil exporters, our alternative to your $ 100/brl crude is to pay $ 168! [EPA-HQ-OAR-2010-0799-11785-A1, p. 11]

Now examine Max technologies ICEs at 17.83 cents per mile and 1.18 gg/100 miles; or save 3.15 cents per mile while saving 1.79 gg/100 miles. Much better message to oil exporters: our alternative to your oil is to offset our demand for your oil several mbd while saving a couple of hundred $Billion per year. And with significantly reduced demand, the crude cost should be lower which would apply to all oil demand and would further increase our savings: e.g., if crude price dropped from $100/brl to $ 50/brl and our demand dropped 6mbd (from 20mbd to 14) and world followed and world demand dropped 20 mbd, I calc US crude savings at just under (0.47) half a $ Trillion per year staying in Nation's economy; and with 0.065 $ Trillion less cost for crude to US consumers &Taxpayers, I make it 0.535 $sT/year consumer/taxpayer savings . In addition to savings at home more efficient military vehicles would require less fuel to support missions meaning less frequent fuel convoys saving both money and lives! [EPA-HQ-OAR-2010-0799-11785-A1, p. 11]

Factor in a large number of plugins (EPRI case) and I calc $ 347 per brl crude (vs. $ 168 for EPA proposal, save $s for Max Tech). Need to stop showing oil exporters their oil as a bargain and show them oil should be cost plus a "reasonable" profit!!!! [EPA-HQ-OAR-2010-0799-11785-A1, p. 11]

Once we are moving on Mid & Max the numbers might convince some exporters that a stable for 5 or 10 year price for a guaranteed volume during the transition might be to both our & their benefit ; worth a try, especially close exporters. And we could make this more attractive by working with them to reduce their domestic demand by increased efficiency allowing more to be available for export instead of being used inefficiently (wasting a valuable saleable resource) at home! [EPA-HQ-OAR-2010-0799-11785-A1, pp. 11-12]

I'd also consider increasing our online production capacity but capping it (and even some existing) and buying low cost foreign oil when available; saves our oil until last and in the interim it is available to help stabilize US "pump" price if world crude market goes wild. Keep US price lowest by when National energy resources put out for bid include a condition as follows: crude and Nat Gas will be sold for use within US and in addition to current bid $s (up front cost and royalties) at not to exceed prices must be included as part of bid and lower price needs to be properly accounted for Re: consumer cost; and Govt to have the right to reject all bids if they believe it would be better (lowest consumer's prices) for Nation and all citizens for Corps of Engineers to do the production. [EPA-HQ-OAR-2010-0799-11785-A1, p. 12]

And as increased efficiency will reduce cost and jobs in fuel sector we need to apply these saved resources to other areas to keep the economy & jobs at high level. So a question becomes where to apply freed up resources in the most productive way for Nation to maximize goods & services and foreign sales to pay down debt. [EPA-HQ-OAR-2010-0799-11785-A1, p. 12]

And there is more: many other areas (all need to be evaluated) should be likewise completely & objectively evaluated; I'd start with the tax code. It shouldn't matter how you get your money (earn it at work, earn it from investments or an inheritance) get so much less a base amount based on number in family (max number children 2 – over 2 pay for your own hobby) then a fixed %! Free enterprise Ideology, with Free enterprise focused on their bottom lines vs. taxes a specious argument. Republican's declared Free enterprise the winners a decade ago promising a great economy – well here we are a decade later. What really matters is what we get for our resources and each action needs to stand on it's own merits; is free enterprise the way, sometimes but not always; is Govt tax and spend better, sometimes but not always; or is it better for Nation & citizens for individuals to use the resources as they see fit, also true sometimes but not always! My answer: on a case by case basis it is not how we pay but what do we get for what we pay regardless of how we pay – this needs to be the objective discussion: for each way, case by case, what do we pay and what do we & Nation get, and how, case by case, do we maximize short & long term, with strong emphasis on long term, benefit with availability and price "stability" to Nation & citizens, i.e., get the resources to the sector that will make the best investment – one that creates more value than the resources expended so economic activity is sustainable and growing! [EPA-HQ-OAR-2010-0799-11785-A1, p. 12]

And all changes need to be fair and equitable Re. benefits & burdens to all, i.e., not politicians protecting their special interests – every time politicians provide an advantage to a special interest Consumers & Taxpayers have to pay for it; there is no free lunch for Consumers & Taxpayers!!! Also true when Govt causes cost to go up for same output, e.g., cents per mile total, fixed income citizens have to reduce support in other economic sectors thereby reducing economic support & jobs there; e.g., while plugins add jobs in manufacturing plugins the less money to support other economic sectors results in job losses in these other sectors. And in addition to money and jobs, goods and services produced (miles traveled, houses built, food produced, etc.) is what we get to support our lifestyle – we need to watch goods & services criteria carefully as this sets our standard of living, which is what really counts and we need to focus on! [EPA-HQ-OAR-2010-0799-11785-A1, pp. 12-13]

4. Additionally, Govt is mandating more expensive liquid fuel when all Govt actions counted, Le., 36 billion barrels per year of ethanol most all of which I expect will be corn based, and do not forget to include all impacts, including taxes & inflation. I calc cost to the Nation for 36 BBris ethanol to be another $ 3220 added fuel cost per vehicle for EPA's proposal mix unaccounted for. [EPA-HQ-OAR-2010-0799-8041-A1, p. 2]

Organization: Mass Comment Campaign (20) (Union of Concerned Scientists-1)

A strong clean car program is good for all Americans. The proposed standards would save the average consumer $6,000 over the lifetime of a new 2025 vehicle, even after accounting for the additional costs of clean car technology. This estimate assumes gas prices will remain below the 2011 average until at least 2025; if gas prices instead continue to rise, savings from increased fuel efficiency will rise as well. [EPA-HQ-OAR-2010-0799-1558-A1_MASS, p.1]

Organization: Mass Comment Campaign (39) (Unknown Organization)

Aside from health benefits, I am especially impressed by how these standards can reduce the nation's oil consumption by 12 billion barrels in the next 13 years. This will ultimately lead to a decrease in our reliance on foreign oil, which is a great step forward for the United States security. [EPA-HQ-OAR-2010-0799-1245-A1_MASS, p.1]

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 41.]

In addition, earlier introduction of cleaner vehicles will provide added assurance that the projected fuel performance is achieved by 2025.

Organization: National Automobile Dealers Association (NADA)

[Supplemental comments to the testimony]

VI. Any "Savings" Related To Particular Purchases Will Vary Depending On an Individual's or Household's Transportation Profile

In addition to falling prey to a "if they build it, they will come" mentality, several folks testifying at the hearings, along with EPA and NHTSA, mistakenly used macro data to back into assertions of "consumer savings." It is both inappropriate and overly simplistic to suggest that a new vehicle fleet phased-in over a certain number of years which may result in gross reductions in fuel use compared to a base scenario, necessarily will result in "the average consumer saving X dollars, " assuming an average vehicle miles travelled (VMTs)and a certain fuel price. [NHTSA-2010-0131-0267-A1, p.5]

Such an analysis raises at least two significant problems. First, to make assumptions so many years in advance based on historically volatile variables is an inherently weak proposition. Second, if and to what extent a given household may achieve a "pay-back" depends on its individual baseline, not on an assumed national average. NHTSA and EPA should conduct a more nuanced analysis of potential "fuel savings," including a careful review of the economic status of prospective purchasers, of whether new vehicle purchases will serve as replacements or as new additions, of the spectrum of VMTs for a set of foreseeable fuel price scenarios, etc, rather make crude, backed-into estimates of “consumer savings” using macro assumptions. [NHTSA-2010-0131-0267-A1, p.5]

Organization: Natural Resources Defense Council (NRDC)

EPA and NHSTA should update fuel price inputs to reflect current forecasts which are higher than those used by the agencies and demonstrate that the agencies took a conservative approach in setting stringency. [EPA-HQ-OAR-2010-0799-9472-A2, p. 3]

NHTSA’s baseline sensitivities based on voluntary overcompliance should be excluded from the final rule. [EPA-HQ-OAR-2010-0799-9472-A2, p. 4]

III. Design of the Standards

A. Stringency

1. Stringency Should be Higher Based on Most Recent Fuel Price Forecasts

The 54.5 mpg standards are strong but stronger standards are feasible and cost-effective, especially under higher fuel prices predicted by the Energy Information Administration (EIA). To develop an economically feasible and cost-effective standard, the agencies used a projection of fuel prices from the EIA Annual Energy Outlook (AEO) 2011. Since the proposal, the EIA has published AEO 2012 Early Release Reference Case, which projects prices to be $0.24 - $0.34 per gallon higher than the AEO 2011 Reference Case during 2017 to 2035. The higher gasoline prices would increase the fuel-saving technologies that could be applied cost effectively and justify a higher standard. [EPA-HQ-OAR-2010-0799-9472-A2, p. 9]

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

Transportation Program Funding

The overall reduction in fuel consumption resulting from this rule will affect fuel tax revenues and by extension, transportation funding that relies on per-gallon fuel taxes. While such revenue losses are a legitimate concern, this issue should not be a determinant of the final GHG standards adopted under this rule. For many reasons, federal and state agencies responsible for transportation infrastructure are faced with having to consider non-traditional mechanisms to ensure sustained funding into the future. Funding for transportation infrastructure should be addressed in a broader context outside of this regulatory proceeding. [EPA-HQ-OAR-2010-0799-9476-A1, p. 3]

As expected, a 6 percent annual rate of improvement in fuel economy would have a modestly greater impact on fuel tax revenues compared to the 5 percent rate proposed in the regulation. In either case, a reduction in tax revenue equates to a tax savings of the same amount for consumers. Over a span of 9 years (2017 – 2025) under the proposed 5 percent scenario, total tax revenue in the NESCAUM region from gasoline sales is estimated to be between $28 and $39 billion, depending on the discount rate applied to the net present dollar value. Under the 6 percent scenario in the same timeframe, this amount would be reduced by between $130 and $190 million, or around 0.5 percent of total revenues. By year 2025, the percentage reduction in revenues would be around 1.3 percent and from that point would gradually increase due to continued attrition of older vehicles in the fleet and top out in approximately 20 years at around a 3.5 percent reduction in revenues. [EPA-HQ-OAR-2010-0799-9476-A1, p. 3]

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

Consider more realistic gas price projections: When considering gas prices, the agencies use AEO's 2011 Reference Case. AEO's forecast assumes that gas prices will average $3.54 per gallon in 2025 (in 2009 dollars). According to EIA's own "This Week in Petroleum," gas prices the week of February 6, 2012 averaged $3.48 per gallon nationwide.33 It is shocking to think that gas prices will barely rise from 2012-2025. Although the agencies do consider higher gas prices in sensitivity analyses, when considering setting standards and the benefits derived from those standards, the agencies should place greater emphasis on the high gas price scenarios. We have attached comments submitted to the docket previously by Sierra Club regarding gas price assumptions. [See Docket number EPA-HQ-OAR-2010-0799-9549-A3 for previous comments.] [EPA-HQ-OAR-2010-0799-9549-A2, 10]

---

33 http://www.eia.gov/oog/info/twip/twip_gasoline.html

Organization: Smith, G.

'Save families an estimated $8,200 in fuel savings over the lifetime of a new vehicle by 2025, for a total of $1.7 trillion in national fuel savings over the life of the program.' They fail to point out the 1) extra cost of fuel efficiency in vehicles 2) discomfort of the considerably smaller vehicles we will have to drive 3) loss of sales by domestic auto companies because they are perceived as not being able to build good small cars. [EPA-HQ-OAR-2010-0799-8438-A1, p. 1]

Organization: Union of Concerned Scientists (UCS)

(g) Gasoline Prices

As noted above, the Energy Information Administration's Annual Energy Outlook (AEO) has become a common source used in many energy-related projections. However, that fact does not justify applying the AEO "reference case" projection, when there are very clear indications that the price projection is poor at best. According to AEO2011 – the projection used in this proposed rule – gasoline prices will range from $3.25-$3.55 per gasoline (in 2009 dollars) between 2017 and 2025. It is hard to accept this as reasonable, given that the actual 2011 average price was $3.53, a mere two cents per gallon shy of EIA's 2025 gasoline price projection. Further, AEO2011 projects regular gasoline prices will rise to a peak of $3.71 per gallon in 2035, a pump price not infrequently seen across the nation today. Clearly, the use of AEO2011 reference case gasoline price projection is inappropriate and should not be used in the agencies' final rule, as it unfairly diminishes the monetary value of fuel saved under the program. [EPA-HQ-OAR-2010-0799-9567-A2, p. 13]

Within the past few weeks, EIA issued the AEO2012 Early Release, which includes a notable increase in gasoline prices over AEO2011. For the 2017-2035 window, AEO2012 Early Release reflects per-gallon prices $0.24 to $0.34 higher than AEO2011 values (converted to 2010 dollars). EPA and NHTSA should, at a minimum, adopt the higher AEO2012 price projections, and investigate the historical accuracy of AEO's High Price scenarios. If it is deemed that AEO's High Price scenarios have, over the past 15 years, been better predictors of actual pump prices, the agencies should utilize High Price Scenario prices for assessing monetary benefits of fuel savings at the pump. [EPA-HQ-OAR-2010-0799-9567-A2, p. 13]

Finally, as UCS has noted in prior comment submissions, AEO's projection does not account for inevitable price spikes that will occur during the lifetime of the vehicles assessed under this rule. Such spikes are closely tied to our nation's inflation and GDP, and thus can have serious economic consequences. With this in mind, the agencies should attempt to quantify the benefits of reduced susceptibility to such spikes, and incorporate them into the program's benefits writ large. [EPA-HQ-OAR-2010-0799-9567-A2, p. 13]

Response:

The Alliance of Automobile Manufacturers suggests that, if states begin to enact legislation to maintain their transportation infrastructure to offset declining gas tax revenues, EPA will then need to evaluate how this could impact consumers' willingness to invest in advanced technology vehicles. However, our analysis shows that compliance can be achieved with less than three percent EVs and PHEVs and just five percent strong HEVs, and those percentages are relative to today's fleet, not the 2025 reference case fleet. See preamble section III.D.6 generally and Table III-52. So our analysis is not heavily reliant on the advanced technology vehicles of which API speaks. Of course, EPA expects to continue conducting analyses of our new standards—most notably for the mid-term review—and will analyze the necessary and pertinent issues as they arise.

Regarding the recommendations from ACEEE, we address the impact of the rule on vehicle sales in Chapter 8.1 of our final RIA and in section 18.7, below. We address the fuel price issue in section 18.5, below. Regarding ACEEE's comments on the "Baseline and other scenarios," we note that these comments appear directed to NHTSA as EPA has not done any analysis assuming that fuel economy will improve after the 2016MY absent any new regulatory requirements.

Regarding comments from ARTBA suggesting that the proposal should include a method of generating federal revenues to offset lost revenue on fuel taxes, we note that EPA and NHTSA do not have the authority to enact revenue generating programs. Such programs must be enacted by Congress. We show the estimated lost revenue in Chapter 5.4 of the final RIA. Our estimates suggest lost tax revenue of roughly $17 billion for the calendar years 2017 through 2025 due to the MYs 2017-2025 standards, and $51 billion over the lifetimes of MYs 2017-2025 vehicles (which includes calendar years 2017 to beyond 2050 for the longest running 2025MY vehicles), both of which are considerably less than the $76 billion through 2025 suggested by ARTBA.

Regarding the comments from BlueGreen Alliance, we discuss vehicle sales in preamble section III.H.11, in Chapter 8.1 of our final RIA and in section 18.7, below.

Regarding comments from CFA, we have used the most recent projected fuel prices available to us at the time modeling inputs had to be locked down. Those fuel prices are taken from the AEO 2012 Early Release. The AEO Early Release projections reflect detailed analysis and are used government-wide. EPA regards this estimate as a reasonable projection (although, like any such projection, actual prices over this period may deviate from those estimated). See also further response on this issue below. Regarding the "price effect," we respond to these comments in section 18.5, below.

Regarding comments from Consumers Union regarding fuel price projections, we agree that predicting future oil and fuel prices is very difficult. EPA leaves that task to the experts at EIA. We believe that the projections provided by EIA represent that best future fuel prices for use in our analysis.

Regarding the comment from the E100 Ethanol Group, we agree that we cannot achieve crude oil independence by increasing CAFE, or GHG standards, alone. However, we can reduce our dependence on foreign oil, consistent with that goal.

Environmental Consultants of Michigan point out that the standards would cost $76 billion in lost fuel tax revenue. EPA agrees that fuel tax revenue will fall if current tax rates remain in place (fewer gallons consumed results in less tax revenue). However, as stated above, our estimates suggest lost tax revenue of roughly $17 billion for the calendar years 2017 through 2025 due to the MYs 2017-2025 standards, and $51 billion over the lifetimes of MYs 2017-2025 vehicles (which includes calendar years 2017 to beyond 2050 for the longest running 2025MY vehicles), both of which are considerably less than the $76 billion suggested by the commenter.

The Environmental Defense Fund commented similarly to the Consumers Union, above. Please refer to our response to Consumers Union. As for sensitivities around fuel prices, we have not done this because doing so would be far more complex than it appears on the surface. To conduct a fuel price sensitivity correctly, we would need to generate unique fleet projections since our fleet projections depend on a macro-economic outlook that would change were we to use different projections of future fuel prices. We have two projected fleets already in our final rule (2008 and 2010 based reference fleets) and could not have added more given the time constraints we had. An alternative approach would have been to use our existing fleet projections and simply use higher/lower fuel prices. However, this would simply show how much our estimated benefits would change with different fuel prices given our existing fleet projections. This would simply show the program to be more or less cost beneficial and, given the magnitude of our fuel savings, higher or lower fuel prices would not change the conclusion that the rule is very cost beneficial.

EPA would like to thank Francis Jackson, the commenters that were part of the mass comment campaigns and NACAA for their comments and interest in our rule.

NADA commented that our payback analysis was not appropriate for every household. EPA does not disagree. However, we cannot calculate the payback period for every household given, as noted by NADA, that the payback period depends on each unique household's transportation profile, their current vehicle's fuel consumption, the new vehicle's fuel consumption, etc. We have attempted to make clear that our payback analysis assumes the average driver that purchases the average vehicle and drives the average number of miles purchasing fuel at the prices projected by AEO in the 2012 Early Release. We have stated that drivers driving more miles will experience a shorter payback while those driving fewer miles will experience a slower payback. We have not meant to imply that everyone that purchases a new 2025MY car will experience the payback we have estimated. For the final rule, we have also included a payback estimate for purchasers of used vehicles to shed light on how their payback might differ from purchasers of new vehicles. We also analyze the issue of low priced vehicles in preamble section III.H.11.b and in section 18.7.1, below.

NRDC suggests that we update our fuel price inputs. We have done so since the proposal and are now using the AEO 2012 Early Release projections. As for standard stringency, we address such comments in section 2 of this Response to Comments document as well as in section III.D of the preamble to the final rule.

NESCAUM commented that funding for transportation infrastructure in light of falling gasoline tax revenues should be addressed in a broader context outside of this regulatory proceeding. We agree and are not addressing this issue in this rule.

Sierra Club, et al, commented that we should use higher fuel price projections in our analysis. We disagree that we should place greater emphasis on the high gas price scenarios rather than the reference case projections generated by EIA. In the AEO 2012 Early Release, EIA states that the Reference case focuses on the factors that shape U.S. energy markets in the long term, under the assumption that current laws and regulations remain generally unchanged throughout the projection period. They further state that the AEO2012 Reference case provides the basis for examination and discussion of energy market trends and serves as a starting point for analysis of potential changes in U.S. energy policies, rules, or regulations or potential technology breakthroughs. As such, we believe that the reference case prices represent the best prices for use in our primary analysis.

Gerald Smith commented in opposition to the rule. Mr. Smith incorrectly claims that supporters of the rule fail to acknowledge the cost of fuel efficiency in vehicles. We have made quite clear in our proposal and our final rule that we expect the cost of new vehicles to increase. For the final rule, we have estimated that cost at $1836 for a 2025MY vehicle meeting the 2025MY standards when compared to one meeting the 2016MY standards. Mr. Smith also suggests that future vehicles will be considerably smaller and less comfortable than today's vehicles. Again, we disagree. Our analysis assumes no change in vehicle size will result from the new standards, and we have still shown a very cost effective path to compliance. Mr. Smith also claims that domestic auto makers will lose sales due to the perception that they cannot build good small cars. Again, we disagree. The new Ford Fiesta and Focus and the Chevy Cruze and Sonic prove that the domestic auto makers can and do produce small cars that consumers want.

The Union of Concerned Scientists commented that we should update our fuel prices to use the AEO 2012 Early Release. We have done so. UCS also commented that we should consider using the AEO high price projections rather than or in addition to the reference case projections. Please refer to our responses to the Environmental Defense Fund and Sierra Club, et al, above. Lastly, UCS suggests that we attempt to quantify the benefits of reduced susceptibility to fuel price spikes that can result from inflation and GDP and can have serious economic consequences. We have not done so for the final rule.

18.4. Benefits of Reduced GHGs and Non-GHG Emissions

18.4.1. Estimated GHG Emissions Reductions Benefits (Including Social Cost of Carbon)

Organizations Included in this Section

Center for Biological Diversity
Environmental Defense Fund (EDF)
Institute for Energy Research (IER)
Institute for Policy Integrity, New York University School of Law
National Association of Clean Air Agencies (NACAA)
Natural Resources Defense Council (NRDC)

18.4.1.1 Comments about Social Cost of Non-CO_2 GHG Emissions

Organization: Center for Biological Diversity

B. The Agencies' Cost-Benefit Analysis is Faulty

Our January 31, 2012 comments to the DEIS contain an extensive discussion of the ways in which the Agencies' cost-benefit analysis must be corrected. We incorporate that discussion here, but add the following observations. [EPA-HQ-OAR-2010-0799-9479-A1, p. 6]

The Agencies acknowledge that they fail to quantify the benefits and costs of a number of the environmental impacts of the rulemaking. These benefits or costs, however, do not have a value of zero, and a number of them can be estimated and those estimates quantified. For example, monetized GHG benefits "exclude the value of reductions in non-CO_2 GHG emissions (HFC, CH4 and N2O) expected under this proposal." The Agencies do not dispute that the value of these benefits is not zero and can be ascertained – indeed, they set themselves a deadline to do so. The decision to delay the analysis is arbitrary and capricious. Similarly, the Agencies exclude the costs of maintaining a U.S. military presence to secure imported oil supplies from unstable regions "because their attribution to particular missions or activities is difficult." "Difficulty" does not justify conducting a cost-benefit analysis that improperly puts a thumb on one side of the scale.33 [EPA-HQ-OAR-2010-0799-9479-A1, p. 7]

---

33 CBD v. NHTSA, 538 F.3d at 1198. [EPA-HQ-OAR-2010-0799-9479-A1, p. 7]

34 ICCT Comments at 7, 8. The ICCT Comments contain other examples of Agency overestimation of costs and underestimation of technology improvements. [EPA-HQ-OAR-2010-0799-9479-A1, p. 7]

Organization: Environmental Defense Fund (EDF)

IV. AGENCIES SHOULD INCLUDE MORE COMPREHENSIVE ESTIMATION OF BENEFITS

F. EPA SHOULD INCLUDE A QUANTIFICATION OF THE SOCIAL BENEFITS OF NON-CO_2 GREENHOUSE GAS REDUCTIONS

EPA's Regulatory Impact Analysis does not currently include estimates for the monetized impacts of this rule for reductions of non-CO_2 greenhouse gases. 28 The Interagency Working Group on SCC did not estimate the social costs of non-CO_2 GHGs when it developed the current SCC values. The agency has requested comment on whether the "global warming potential (GWP) approach" should be used as an interim approach to valuing the costs of non-CO_2 GHGs (as it did in their proposed New Source Performance Standards (NSPS) for oil and gas exploration). This approach uses the GWP of non-CO_2 gases to estimate CO_2 equivalents and then multiplies these CO_2 equivalent emission reductions by the social cost of CO_2. Further, the agency has requested comment more broadly regarding methodologies for monetizing the benefits of reductions of non-CO_2 GHGs. [EPA-HQ-OAR-2010-0799-9519-A1, pp. 11-12]

EPA should include a range of estimates for the monetized benefits of reduced emissions of non-CO_2 GHGs that will result from this rule (methane, nitrous oxides, hydrofluorocarbons). While there remain uncertainties associated with the currently available methodologies for estimating these benefits, it is clear that there are real benefits; they are most certainly not zero. Therefore, the omission of any estimate at all is unsatisfactory, and EDF strongly recommends the agency include and consider a range of potential estimates. [EPA-HQ-OAR-2010-0799-9519-A1, p. 12]

There are currently two useful quantification methods available for the benefits of reducing non-CO_2 GHGs. First, Marten and Newbold estimate the social costs of methane and nitrous oxide in a recent National Center for Environmental Economics working paper,29 and second, the GWP method, while imperfect, is better than not estimating the benefits at all, and can be used as a proxy. The agency should use these tools to report a range of monetized benefits for the rule. Since the agency has a quantitative foundation in the form of two methodologies for estimating the social costs of these non-CO_2 GHGs, it should provide monetized benefits using both of these methodologies (accompanied by an explanation of any limitations and/or uncertainties in each methodology, as necessary). [EPA-HQ-OAR-2010-0799-9519-A1, p. 12]

In Marten and Newbold, the authors directly calculate the social cost of methane and nitrous oxide using the methodology used by the Interagency Working Group on the SCC, with some updates. This direct method would be the most straightforward, defensible, and consistent with earlier valuation efforts of greenhouse gases. As Marten and Newbold's method is a valid and analytically supportable method, EPA should include figures calculated using their approach. [EPA-HQ-OAR-2010-0799-9519-A1, p. 12]

The GWP method consists of converting the non-CO_2 GHG emission reductions to CO_2-equivalent using global warming potentials (GWPs), then multiplying the resulting CO_{2e} figure by the SCC. As noted by Marten and Newbold, this approximation of the climate benefits of methane and nitrous oxide reductions has the potential for significant error: in 2010 emission reductions for methane valued using the 100 year GWP could be underestimated by as much as 36% while nitrous oxide could be overvalued by as much as 60%, depending on the discount rate. However, they specifically point out that for some policies, such as the light duty vehicle rule30 where non-CO_2 gases represent only a fraction of the anticipated GHG reductions, the error induced by using the GWP method may be small. And most importantly, the authors also note, " . . . if estimates of the social cost are not available, the value of non-CO_2 GHG reductions estimated using GWPs and the $SCCO_2$ will typically have lower absolute errors than default estimates of zero." In other words, using GWP and the SCC to calculate the value of non-CO_2 emissions reductions is more accurate than not calculating the value, particularly in the case of policies such as this one where the reductions of non-CO_2 gases are a small portion of the overall GHG reductions. If EPA is unable to include directly-calculated social costs in support of the final rule due to methodological problems and uncertainties, it should (after identifying and explaining those problems) include an estimate of climate benefits calculated using this GWP method. [EPA-HQ-OAR-2010-0799-9519-A1, pp. 12-13]

Regarding the specific GWP values, EPA should be commended for using the most recent Intergovernmental Panel on Climate Change (IPCC) GWP value for methane (25) from the Fourth Assessment Report in this rule proposal. However, even the most recent IPCC GWP from the Fourth Assessment Report may somewhat undervalue methane's strength as a climate forcer. [EPA-HQ-OAR-2010-0799-9519-A1, p. 13]

EPA should, at least, include a sensitivity analysis using the more recent estimate from Shindell et al. (2009) of 33.31 EPA should provide a range of benefits yielded from the various methods and assumptions (c.f. table 1 in Marten and Newbold), as well as a clear, tabular, demonstration of how it has calculated the monetized benefits. [EPA-HQ-OAR-2010-0799-9519-A1, p. 13]

Organization: Institute for Policy Integrity, New York University School of Law

The Agencies Should Work Toward Developing Non-Carbon Dioxide Benefits Estimates

The Working Group had also planned to develop better methods for estimating the benefits of reducing non-carbon dioxide greenhouse gases within the same two-year timeframe mentioned above.70 The SCC does not smoothly translate into damage figures for other greenhouse gases like methane and hydrofluorocarbons, because of different radiative forcing, atmospheric lifetimes, and environmental impacts.71 As a result, the proposed rule excludes the monetized value of non-carbon dioxide greenhouse gas reductions, even though such reductions make important contributions to the program's climate benefits. [EPA-HQ-OAR-2010-0799-9480-A1, p. 11]

Organization: Natural Resources Defense Council (NRDC)

Our recommendations regarding the GWP method and SCC are summarized as follows [*Note: NRDC recommendations regarding SCC are listed below in section 18.4.1.2*]:

1) GWP Method. Because models directly estimating climate mitigation benefits for other gases are still in their early stages of development, GWPs should be used to calculate climate benefits from reducing non-CO_2 greenhouse gases (Recommendation #1). In so doing, 100 year GWPs should be used, following domestic and international conventions. Further, the most recent GWP estimates from the IPCC's Fourth Assessment Report should be used (rather than GWP estimates from the Second Assessment Report, as was recently used in the proposed oil and gas new source performance standards for methane). For methane calculations and carbon monoxide, EPA should do a sensitivity analysis using the most recently published GWP estimates (Shindel et al.4) (Recommendation #2); in addition, CO_2 fertilization benefits need to be adjusted to reflect non-CO_2 gases actual contribution of CO_2 to the atmosphere, which is less than direct CO_2 emissions (Recommendation #3). [EPA-HQ-OAR-2010-0799-9472-A1, p. 5]

Response:

EPA reviewed the comments regarding monetization of non-CO_2 GHG impacts (CH_4, N_2O, HFCs) and recognizes that the rulemaking will achieve non-zero, economic benefits through reductions in these gases. EPA estimated the non-CO_2 GHG benefits in a sensitivity analysis for the final rule using the GWP approach because directly modeled interagency estimates are not available. The GWP approach entails converting the reductions of each non-CO_2 gas to CO_2-equivalents using the GWP and then valuing the CO_2-equivalents with the SCC. EPA presented these estimates for illustrative purposes and did not include them in our total benefits estimate for this rulemaking because of the following GWP approach limitations.

While the GWP approach would provide an approximation of the monetized value of the non-CO_2 GHG reductions anticipated from this rule, it produces estimates that are less accurate than those obtained from direct model computations for a variety of reasons, including the differences in atmospheric lifetime of non-CO_2 gases relative to CO_2. This is a potentially confounding issue given that the social cost of GHGs is based on a discounted stream of damages—i.e., they are not constant over time—and that are non-linear in temperature. For example, CH_4 has an expected adjusted atmospheric lifetime of about 12 years and associated GWP of 25 (IPCC Fourth Assessment Report (AR4) 100-year GWP estimate). Gases with a relatively shorter lifetime, such as methane, have impacts that occur primarily in the near term and thus are not discounted as heavily as those caused by longer-lived gases such as CO_2, while the GWP treats additional forcing the same independent of when it occurs in time. Furthermore, the baseline temperature change is lower in the near term and therefore the additional warming from relatively short-lived gases will have a lower marginal impact relative to longer-lived gases that have an impact further out in the future when baseline warming is higher.

In addition, impacts other than temperature change also vary across gases in ways that are not captured by GWP. As noted in NRDC's comments, CO_2 emissions, unlike CH_4, N_2O, or HFCs, will result in CO_2 passive fertilization to plants. EPA recognizes this limitation but cannot, as NRDC recommended, simply adjust the GWP to account for the difference. The only way to adequately resolve this limitation is to directly model each non-CO_2 gas cycle. As discussed further below, EPA believes there are several key modeling issues that must be addressed before non-CO_2 gases can be modeled, and thus the interagency group has not yet directly modeled non-CO_2 GHGs.

A limited number of studies in the published literature explore the implications of using a GWP versus a direct estimation approach to quantify the benefits of changes in non-CO_2 GHG emissions from a given policy. One recent working paper (Marten and Newbold, 2011), found that the GWP-weighted benefit estimates for CH_4 and N_2O are likely to be lower than those that would be derived using a directly modeled social cost of these gases for a variety of reasons.[81] The GWP reflects only the integrated radiative forcing of a gas over 100 years. In contrast, the directly modeled social cost differs from the GWP because the differences in timing of the warming between gases are explicitly modeled, the non-linear effects of temperature change on economic damages are included, and rather than treating all impacts over a hundred years equally, the modeled social cost applies a discount rate but calculates impacts through the year 2300.

EPA has determined that key modeling issues must be addressed before directly modeling CH_4, N_2O, HFCs in a manner consistent with the 2009-2010 interagency modeling exercise. For example, a challenging issue in estimating the social cost of non-CO_2 GHGs is that the integrated assessment models vary in how they represent the atmospheric chemistry for these gases. DICE (Dynamic Integrated Climate and Economy) in particular poses a challenge because it does not directly model the atmospheric gas cycle for any GHG other than CO_2. Instead, it jointly represents all non-CO_2 GHGs through a single net radiative forcing vector. The other integrated assessment models, PAGE (Policy Analysis of the Greenhouse Effect) and FUND (Climate Framework for Uncertainty, Negotiation, and Distribution), directly represent the atmospheric chemistry for several non-CO_2 GHGs (noting that for PAGE not all gas cycles, such as methane, were used in the analysis).

There are options to incorporate a defensible cycle for methane in the DICE model, such as supplementing DICE with changes in radiative forcing estimates from MAGICC, a climate model that incorporates important interactions between various gases in the atmosphere.[82] This modification, however, would differ from the methodology established by the 2009-2010 Interagency Work Group.

In addition, EPA has reviewed the comments recommending use of alternative GWPs, in particular Shindell et al's recent estimate of 33 for a 100-year GWP of methane. However, EPA is continuing to use the 100-year GWP approach recommended by the IPCC, consistent with the UNFCCC reporting requirements and the values used in the regulations and analyses for this rule. EPA believes it would be inappropriate to use alternative GWP estimates in the analyses,

[81] Marten, A. and S. Newbold. 2011. "Estimating the Social Cost of Non-CO2 GHG Emissions: Methane and Nitrous Oxide." NCEE Working Paper Series #11-01. http://yosemite.epa.gov/ee/epa/eed.nsf/WPNumber/2011-01?opendocument. Accessed May 24, 2012.

[82] For example, see Marten and Newbold (2011) "Estimating the Social Cost of Non-CO2 GHG Emissions: Methane and Nitrous Oxide." NCEE Working Paper Series #11-01. http://yosemite.epa.gov/ee/epa/eed.nsf/WPNumber/2011-01?opendocument. Accessed May 24, 2012.

even in sensitivity analyses, that have received relatively less scrutiny than those cited in the IPCC reports.

The results of the sensitivity analysis are presented for illustrative purposes in preamble section III.H.6 and in Chapter 7 of EPA's RIA. In sum, the total net present value of annual 2017 through 2050 GHG benefits for this rulemaking would increase by about \$3 billion to \$50 billion, depending on discount rate, or roughly 10 percent if these non-CO_2 estimates were included. Given the magnitude of this increase in the context of the total costs and benefits considered in this rule and other critical decision factors related to technical issues, inclusion of these estimates in the primary analysis would not affect any of the decisions regarding the appropriateness of the standards EPA is adopting here.

Regarding presentation of the non-CO_2 GHG benefits, EPA agrees that a clear, tabular summary would be useful to the reader and has therefore included them in Table III-89 in the RIA for illustrative purposes.

EPA has responded to comments regarding improvements to the social cost of CO_2 in the next section, 18.4.1.2.

Finally, EPA has responded to several of the comments above in other sections. For a response to comments about the treatment of "costs of maintaining a U.S. military presence to secure imported oil supplies from unstable regions," please see section 18.5 in this document. Regarding comments that the agencies should incorporate potential benefit revisions in the mid-term evaluation process and account for the net upstream emissions from electric vehicles, please see section 2.4 (mid-term evaluation) and section 4 (electric vehicles) for EPA's response.

18.4.1.2 Comments about Social Cost of CO_2 (Support for and recommendations to improve estimates)

Organization: Environmental Defense Fund (EDF)

IV. AGENCIES SHOULD INCLUDE MORE COMPREHENSIVE ESTIMATION OF BENEFITS

A. AGENCIES SHOULD ACCOUNT FOR ALL QUANTITATIVE AND QUALITATIVE BENEFITS

EDF recommends, where feasible, the agencies must estimate the monetized health, environmental and economic benefits. We also recommend that where monetization is not feasible, the Agency must present a qualitative list of benefits and explain why it is not feasible to monetize such benefits. This recommendation is in accordance with a January 2011 Presidential Executive Order18: "It must take into account benefits and costs, both quantitative and qualitative." "(c) In applying these principles, each agency is directed to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible. Where appropriate and permitted by law, each agency may consider (and discuss qualitatively) values that are difficult or impossible to quantify, including equity, human dignity, fairness, and distributive impacts.” [EPA-HQ-OAR-2010-0799-9519-A1, pp. 7-8]

E. SOCIAL COST OF CARBON

It is critical that NHTSA and EPA collaborate with other agencies and carry out their responsibilities to accurately account for the Social Cost of Carbon (SCC). Cf. Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1185 (9th Cir. 2008) (finding a NHTSA fuel economy rule arbitrary and capricious where “[t]he value of carbon emissions reduction [was] nowhere accounted for in the agency's analysis, whether quantitatively or qualitatively”). [EPA-HQ-OAR-2010-0799-9519-A1, p. 9]

The social cost of carbon is a monetary measure of the incremental damage resulting from greenhouse gas (GHG) emissions. The SCC assigns a net present value to the marginal impact of one additional ton of carbon dioxide-equivalent emissions released at a specific point in time. EDF commented extensively on the consideration of the SCC in the first light-duty greenhouse gas rulemaking, the heavy-duty greenhouse gas rulemaking, and the Notice of Intent for Draft EIS. Those comments are hereby incorporated. [EPA-HQ-OAR-2010-0799-9519-A1, p. 9]

It is imperative that the Agencies rigorously and transparently account for the SCC in carrying out responsibilities under NEPA, EISA, and EPCA. In the proposal, it is noted that the Agencies adopted an approach that relies on estimates of the social cost of carbon (SCC) developed by the Interagency Working Group on Social Cost of Carbon. While we support the collaboration and work of the Group, the SCC used should always be based on models reflecting the latest science, as the Agency has itself committed to do. All three modeling teams, whose work led to the report by the Interagency Working Group, have since updated their models to reflect the latest research and methodological developments. At the very least, the SCC used should be updated using the current versions of the models. [EPA-HQ-OAR-2010-0799-9519-A1, p. 9]

We make additional suggestions below as to how current modeling approaches can and should be improved in order to meet the Agency’s commitment to update the social cost of carbon as the underlying models and methodologies are improved22: [EPA-HQ-OAR-2010-0799-9519-A1, p. 9]

- Declining discount rate over time: In assigning a dollar value to reductions in CO_2 emissions, the Agencies use the social cost of carbon and the discount rates included in the Interagency Working Group on Social Cost of Carbon. This includes the use of 5 percent, 3 percent and 2.5 percent discount rates. Recent advances in economic theory indicate that it is not appropriate to use such high and constant discount rates in the context of the social cost of carbon analysis, with a constant 5 percent discount rate being particularly inappropriate. A certainty-equivalent approach, for example, would yield much lower constant discount rates than those currently used. At the very least, we encourage the Agency to use a range of discount rates of 3 percent and below in its SCC analysis. We strongly recommend, however, that the Agency move as soon as possible to the use of a declining social discount rate. Appropriately accounting for uncertainty around the discount rate over long time horizons generates a discount rate that declines over time. As demonstrated at an academic workshop convened by Resources for the Future on Intergenerational Discounting, September 22-23, 2011, there is broad support for the use of declining discount rates within the relevant community of experts.23 These declining rates reflect the scientific, economic, and ethical complexities and uncertainties inherent in intergenerational discounting. [EPA-HQ-OAR-2010-0799-9519-A1, pp. 9-10]

- Evaluating catastrophic risks: The SCC numbers currently used seriously undervalue low-probability/high-consequence climate impacts. Functional form assumptions in the models used in the Interagency Report misrepresent these risks and lead to inaccurately-low SCC numbers. In particular, they cut off the tails of distribution functions too quickly, ignoring potentially catastrophic climate risks.24 The SCC numbers used should reflect the uncertainty range around different functional forms and standard assumptions around risk aversion in order to more accurately value potentially catastrophic climate impacts.25 [EPA-HQ-OAR-2010-0799-9519-A1, p. 10]
- Evaluating Non-Monetized Benefits: GHG reduction policies can significantly undervalue benefits simply because some of these benefits are not easily quantifiable. The White House Office of Management and Budget recognizes that some costs and benefits will be difficult to monetize, but directs agencies to consider other means of quantification.26 We request that the social cost calculations be updated to include the latest results on newly monetized benefits. All additional climate impacts omitted from the models should at the very least be identified explicitly. A table should be provided that lists, for each economic model, what impacts were not included in the model's estimate of monetized damages. Accompanying text should serve to explain and complement the table entries but not be a substitute for them. Below, we have provided an example table listing impacts typically omitted from SCC models. [EPA-HQ-OAR-2010-0799-9519-A1, p. 10]

[See list on p. 12 of Docket number EPA-HQ-OAR-2010-0799-9519-A1]

Organization: Institute for Policy Integrity, New York University School of Law

The rule would raise the corporate average fuel economy standards for new automobiles and restrict the levels of greenhouse gases that vehicles may emit. While the proposed rule will generate large net social benefits, prior to the rule's final publication, the agencies should consider adopting several refinements to their calculation of benefits and their approach to vehicle attributes. [EPA-HQ-OAR-2010-0799-9480-A1, p. 1]

• The agencies should increase estimates of climate benefits to more accurately value the chance of catastrophic damages. Substantial economic literature, including much published in the last two years, supports the conclusion that current models do not place enough emphasis on catastrophic scenarios and, consequently, that some adjustment to the calculation of benefits is necessary. Disagreement over the exact size of that adjustment does not suggest the risk of catastrophe should be valued at zero. [EPA-HQ-OAR-2010-0799-9480-A1, p. 1]

• The agencies should increase estimates of climate benefits to account for risk aversion. Climate change is a categorically different kind of social problem: no single government can self-insure against the risk of irreversible, planet-wide damages. The government, therefore, should be risk averse toward climate change. Though the degree of risk society faces is a subject of contention, most economists believe there is some non-negligible amount of risk that must be accounted for. A risk premium should be incorporated, either as an adder to the value of climate benefits, or as a downward adjustment to discount rates. [EPA-HQ-OAR-2010-0799-9480-A1, p. 1]

• The agencies should continually revise estimates of climate benefits to reflect the most recent scientific and economic knowledge. Even if a better estimate of benefits will not change the stringency or structure of the proposed rule, accuracy remains important. Professional and legal norms for economic analysis require it; accurate benefits estimates will increase confidence in the justifications for the rule and inform the public debate; and the agencies' impact analysis will set a precedent for future rulemakings. The agencies should take the lead on adjusting estimates to account for risk and catastrophic damages, as well as the latest climate science. [EPA-HQ-OAR-2010-0799-9480-A1, p. 2]

• The agencies should make several other improvements in the valuation of climate benefits, including development of non-carbon dioxide estimates, incorporation of potential benefit revisions in the mid-term evaluation process, and accounting for the net upstream emissions from electric vehicles. [EPA-HQ-OAR-2010-0799-9480-A1, p. 2]

Part I. Climate Benefits

The proposed rule will significantly reduce greenhouse gas emissions and takes an important step in addressing climate change. However, the proposed rule underestimates the benefits of these emissions reductions. In so doing, it understates the need for increased reductions and sets standards that are more lenient than socially optimal. Developing the most accurate estimates of climate benefits and the appropriate stringency for emissions standards will set a valuable precedent for all future rulemakings that affect greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-9480-A1, p. 2]

The agencies should make several improvements to their calculation of the rule's climate benefits. Most importantly, the agencies should update the social cost of carbon (SCC) estimate to: (1) reflect risk aversion, (2) appropriately weigh the possibility of catastrophic climate change, and (3) incorporate the most recent scientific advances on the relationship between greenhouse gas emissions and climatic stability. [EPA-HQ-OAR-2010-0799-9480-A1, p. 2]

Disagreement over the size of risk aversion and catastrophic risk does not mean they should be valued at zero. Without more fully accounting for risk aversion and catastrophic climate outcomes, the SCC estimates used in the rule will be too low. [EPA-HQ-OAR-2010-0799-9480-A1, p. 2]

The SCC revision process should be understood as an on-going activity that continually updates estimates to reflect the most recent science. The state of science on this issue continues to expand at a rapid pace, and it is important that the agencies incorporate recent insights as quickly as possible. The agencies should also seek to develop estimates for the benefits of non-carbon dioxide reductions, and the SCC revision process should be extended and incorporated into the mid-term evaluation of the regulation. Finally, the agencies should rethink the way they calculate emissions from alternative fuel vehicles. [EPA-HQ-OAR-2010-0799-9480-A1, p. 3]

Background on the Social Cost of Carbon

The social cost of carbon (SCC) is an "estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change."2 Theoretically, the SCC includes all the economic losses associated with global climate change. An interagency working group (Working Group), which included both EPA and DOT, released initial estimates of the SCC in February 2010.3 [EPA-HQ-OAR-2010-0799-9480-A1, p. 3]

That report harmonized the federal government's approach to valuing climate benefits and developed an initial set of four alternative estimates. The four estimates were built around the results from three integrated assessment models (IAMs), which "translate emissions into changes in atmospheric greenhouse concentrations, atmospheric concentrations into changes in temperature, and changes in temperature into economic damages." 4 The proposed rule discusses all four SCC estimates, but relies mostly on the "central" value, which is based on a 3% discount rate.5 However, both the Working Group and the proposed rule note that the IAMs and the current SCC estimates contain significant limitations: incomplete treatment of catastrophe, uncertainty in the extrapolation of damages to high temperatures, and underdeveloped assumptions about risk aversion.6 The agencies seek comment on the assumptions used to determine the SCC.7 [EPA-HQ-OAR-2010-0799-9480-A1, p. 3]

The Agencies Should Increase the SCC Estimates to More Accurately Value Catastrophic Change

The possible levels of climate damages are often modeled as a distribution describing the probabilities of various economic outcomes. The Working Group estimated the SCC by analyzing probability distributions generated by three IAMs, using those distributions to calculate the expected climate damages society would experience at various concentrations of greenhouse gases. IAMs, however, generally undervalue the possible damages associated with catastrophic climate change by reducing the complexity of the problem8—though scientific research predicts a non-negligible chance of a planet-wide, truly disastrous climate catastrophe, IAMs do not give much weight to such low-probability scenarios that exist on the far end of the probability distribution curves.9 [EPA-HQ-OAR-2010-0799-9480-A1, p. 3]

In short, the true probability distribution of climate damages has a longer and fatter right-hand tail than is represented in IAMs. 10 Weitzman argues that considering such "fat tails" increases the expected damages significantly, which could exert enormous influence on society's willingness to pay for emissions abatement.11 That is, because extreme climate outcomes would impose such enormous economic losses, even relatively unlikely scenarios can shift the expected damages from climate change dramatically to the right. Should the possibility of these outcomes be great enough, the effect of such catastrophic damages could dominate the analysis. Tol notes similar difficulties with IAMs,12 and the National Academy of Sciences found that IAMs insufficiently measure the totality of these effects.13 (The fact that both Weitzman and Tol find similar problems with IAMs14 [EPA-HQ-OAR-2010-0799-9480-A1, p. 4]

In early 2010, the Working Group suggested that scholarly disagreement warranted further investigation before it would be appropriate to adjust the SCC to account for catastrophic damages. is notable given their history of disagreement over optimal mitigation policies.) Because the Working Group's analysis relied heavily on IAMs that do not fully account for the possibility of catastrophic damages, the agencies should adjust SCC estimates upward to properly value expected climate damages.15 The Working Group referred to the work of Nordhaus,16 Pindyck,17 and Newbold and Daigneault18 to support its decision to delay addressing catastrophic damages. While Nordhaus's work is seminal in many ways, it is often recognized as undervaluing catastrophic outcomes. He relies heavily on one IAM (namely, DICE) that suffers from the problems explained above: it fails to fully account for the influence of catastrophic climate outcomes.19 Newbold and Daigneault's results indicate that basing substantial SCC adjustments on catastrophic damages would depend heavily on the values assigned to model parameters. This merely shows that calculation of expected values is difficult and that extreme results such as Weitzman's20 do not always hold. Their basic conclusion that current IAMs inadequately account for catastrophic damages21 still cuts in favor of some upward adjustment to the SCC, not waiting for further research. Pindyck finds only moderate expected utility differences when considering a wide distribution of climate outcomes.22 However, he uses a simplified IAM with different damage and growth functions that do not assume fat tails. Yet it is fat tails and the growing possibility of extreme outcomes that drives much of the catastrophic damage analysis. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 4-5]

The Working Group claimed that "further research in this area is needed before its practical significance can be fully understood and a reasonable approach developed to account for such risks in regulatory analysis."23 In fact, no amount of research can lead to a "full understanding" of this problem. Nevertheless, a practical approach to treating catastrophe can be developed and implemented. Indeed, because a greater possibility of catastrophic damages exists than is included in the IAMs used by the Working Group (the Working Group essentially admits that this is the case24), the practical approach is to adjust the SCC upward. The fact that there is disagreement about the size of this catastrophic damage adjustment does not suggest that it should be zero.25 [EPA-HQ-OAR-2010-0799-9480-A1, p. 5]

Moreover, a substantial amount of research has been published since the Working Group's report, adding to a growing body of literature that highlights the limitations of IAMs with regard to catastrophic damages. In the next revision of the SCC estimates, the agencies and the Working Group must address the relevance of work by Pycroft, Vergano, Hope, Paci, and Ciscar, 26 Millner,27 Ackerman, Stanton, and Bueno,28 Dietz,29 and Gerst, Howarth, and Borsuk.30 Combined with the work of climate scholars like Weitzman and Tol,31 the economic literature supports the proposition that IAMs do not place enough emphasis on catastrophic damages and, consequently, some adjustment should be made to account for this limitation. [EPA-HQ-OAR-2010-0799-9480-A1, p. 5]

The studies that attempt to calculate the amount of adjustment necessary generally find it to be large. Yohe and Tol opine that increasing the SCC by 50% "is not out of the question" given the non-zero risk of catastrophic climate change. 32 In stylized conditions of structural uncertainty, Weitzman shows that the SCC might be infinite.33 This seems implausible, and several studies react by restricting the damage function to avoid this result.34 Pycroft, Vergano, Hope, Paci, and Ciscar find that allowing for the possibility of different tail sizes in both the climate sensitivity parameter and the damage function lead to increases in the SCC of 33% to 115%.35 A number of other studies suggest methods for addressing the problem of catastrophic changes. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 5-6]

Rather than waiting an indefinite amount of time for further insights, the agencies and the Working Group should evaluate the existing literature, make a decision about the best way to apply it, and begin incorporating greater consideration of catastrophic damages into the analysis to produce the most accurate SCC estimates available. If the agencies do not make an adjustment to the SCC estimates for catastrophic damages, the rule will underestimate greenhouse gas reduction benefits and will risk setting a precedent for future emissions standards to be less stringent than socially optimal. [EPA-HQ-OAR-2010-0799-9480-A1, p. 6]

The Agencies Should Increase the SCC Estimates to Account for Risk Aversion36

Climate change outcomes are uncertain: the exact damages each additional unit of greenhouse gas emissions will cause are unknown. Consequently, each unit of emissions contributes additional risk that climate damages will be worse than expected. [EPA-HQ-OAR-2010-0799-9480-A1, p. 6]

This risk can be valued by thinking of climate abatement as an investment. Most people are naturally risk averse; when investments involve risk, people are willing to pay for greater certainty than when only considering the expected returns of the investment.37 For example, an investment option with less risk will typically sell at a higher price than a risky investment, even if the two alternatives have an equal expected payout. In portfolio theory, that price differential represents the risk premium that risk-averse actors demand for holding a risky asset. Investors also mitigate risk by buying investments that co-vary so that, ideally, when one investment performs poorly, the other performs well, increasing the certainty that the total investment portfolio will have positive returns. Thus, when investing in a range of assets, the covariance of the assets helps determine the price investors will pay for those assets. [EPA-HQ-OAR-2010-0799-9480-A1, p. 6]

The Working Group decided in early 2010 to continue “investigating” the issue of risk aversion in lieu of including a risk premium in the SCC. The Working Group did note that Anthoff, Tol, and Yohe found that risk aversion is at least as important as the rate of time preference 38 —a topic that the Working Group discusses in great detail. However, without citing studies with different results, it still concluded that further investigation was necessary before including a risk premium in the SCC. [EPA-HQ-OAR-2010-0799-9480-A1, p. 6]

It failed to mention the work of Heal and Kristrom,39 Heal,40 Hennlock,41 Tol,42 Yohe and Tol,43 or additional work by Weitzman,44 among many others that suggest the use of significant risk premiums. In short, the decision to delay inclusion of a risk premium in the SCC is inconsistent with the literature. Although scholars use different methods for calculating risk premiums and arrive at different results, disagreement over the size of these values does not suggest that they should be zero.45 The degree of risk society faces is a subject of contention, but most economists believe that there is some non-negligible risk premium that must be accounted for in the SCC.46 [EPA-HQ-OAR-2010-0799-9480-A1, p. 7]

More important than the precise value is the realization that positive risk aversion warrants incorporating a positive risk premium into the SCC.47 There are two different pathways for risk aversion to be important for calculating the value of greenhouse gas abatement. In the first, mitigation steps taken today can be understood as an investment that is part of a larger portfolio of investments made by society. Under this framework, risk aversion can lead to a higher or lower social cost of carbon, depending on whether the value of greenhouse gas emissions in the future are correlated with the overall growth rate of the economy. To the extent that many of the effects of climate change will involve non-market impacts—the decimation of coral reefs, for example, or widespread extinction of terrestrial species—they may be substantially unrelated to the returns in the economy as a whole. If a substantial share of the damages from climate change is expected to be uncorrelated to returns in the economy as a whole, the discount rate should move toward the risk-free rate. [EPA-HQ-OAR-2010-0799-9480-A1, p. 7]

For policymakers today, there is also a great deal of uncertainty about the relationship between the greenhouse gas emissions and climate outcomes. Resolution of that uncertainty is structurally similar to the realization of a risk that is uncorrelated with market returns, and can be thought of as serving the same function within an investment portfolio. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 7-8]

In addition, the relationship between reductions in greenhouse gas emissions and economic growth reflects causation as well as correlation. Severe climate change could bear negatively and directly on overall economic productivity. For example, sea level rise could threaten large parts of the coastal United States, especially low-lying areas like Florida. In effect, such a causal relationship will be a source of negative correlation between the benefits of mitigation and broader market returns. In climate scenarios with greater temperature change, total damages from climate change will be higher, but total economic activity will be lower (ceteris paribus)—marginal damages and therefore marginal benefits of mitigation will be high (due to convexity of damages) while the returns to the broader economy will tend to be low (the productivity effect). [EPA-HQ-OAR-2010-0799-9480-A1, p. 8]

The second pathway for risk aversion to impact the SCC concerns how investment in climate change mitigation reduces the variance of expected outcomes for the economy as a whole. The distribution of possible climate outcomes is a function of emissions, such that each ton of emissions can amplify the variance of aggregate economic damages and thereby further increase systematic risk. This means that, in addition to increasing the likelihood of catastrophic outcomes, each additional unit of emissions also increases the uncertainty about which outcome will occur. Thus, a full risk premium in the climate change context values the ability of emissions abatement to reduce the variance of outcomes. [EPA-HQ-OAR-2010-0799-9480-A1, p. 8]

Despite these justifications, the Working Group noted that government is usually risk neutral and questioned whether the climate change context merits different treatment. In fact, the nature of the climate problem requires government to be risk averse. For most social problems, the government is large enough that it can self-insure against disaster and act without aversion to risk. But because climate change is qualitatively different than other social problems involving risk, the agencies should treat it differently. The Working Group noted the suggestion in the Office of Management and Budget's Circular A-4 that government agencies should "generally" assume the perspective of a risk neutral actor. But it also observed that society should not always be risk neutral, that Circular A-4 "allows for a different assumption on risk preference in regulatory analysis if it is adequately justified,"48 and that agencies should deviate from the risk neutral perspective when necessary.49 The global nature of climate change catastrophes requires such a deviation. Circular A-4 endorses the use of expected values without a risk premium—here, the average damages of all possible climate outcomes—only when society is risk neutral. However, society will not be neutral when risks cannot be offset by other investments. Compensating for the loss of habitability on Earth is impossible; the ability of the planet to sustain human life is irreplaceable. The magnitude of the damages associated with the risk of catastrophic climate change overwhelms the ability of society to match these damages with gains from other investments.50This suggests that risk aversion is necessary for society to account for the uniquely problematic nature of climate change. [EPA-HQ-OAR-2010-0799-9480-A1, p. 8]

The Working Group attempted to account for risk aversion by including a 95th percentile SCC estimate at a 3% discount rate. 51 The decision to include consideration of risk aversion in one of four estimated SCC values misses the point. Risk and uncertainty are systematic in the climate change context. Consequently, all SCC estimates should include risk premiums to account for these factors. Furthermore, it is not clear whether the selection of the 95th percentile SCC estimate was chosen based on a reasoned connection to the risks under consideration, or out of simple convenience. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 8-9]

Studies that either calculate a risk premium or that include a risk premium when estimating the SCC generally find such premiums to be substantial. Heal finds a premium between 0.1% and 8.13% of national income.52 Tol calculates a risk premium with "conservative assumptions" around $6-$7/ton of carbon dioxide.53 Antoff, Tol, and Yohe report SCCs from about $16/ton of carbon dioxide to over $5,000/ton when incorporating uncertainty into the calculation.54 Finding that uncertainty and equity interact to increase the SCC, they report a final SCC estimate of more than $50/ton of carbon dioxide.55 [EPA-HQ-OAR-2010-0799-9480-A1, p. 9]

These studies constitute several ballpark examples of premium size. Other studies suggest both higher 56 and lower57values for risk premiums. Different assumptions about the degree of risk aversion and parameters in IAMs can radically change modeling outcomes. The point is that the values under consideration are often very large relative to current SCC estimates. The presence of many high estimates for risk premiums suggests that they should be given substantial weight in determining the SCC. [EPA-HQ-OAR-2010-0799-9480-A1, p. 9]

The wealth of studies on this subject provides the agencies with sufficient know-how to incorporate a risk premium into the SCC estimates. The agencies and the Working Group should analyze the range of approaches toward risk and implement the best method for incorporating a defensible risk premium into the SCC. In particular, the agencies should consider including either a "risk adder" or a downward adjustment of the discount rate. 58Without a risk premium, the SCC estimates will be too low and the rule will undervalue benefits from greenhouse gas reductions, setting a precedent for future emissions standards to be inefficiently lenient. [EPA-HQ-OAR-2010-0799-9480-A1, p. 9]

Risk Aversion and Catastrophic Damages Likely Interact, Necessitating Even Larger SCC Values

The combination of risk aversion and uncertainty about catastrophic damages implies an even greater upward adjustment to SCC estimates may be necessary. Millner, Deitz, and Heal argue that differences among complex climate change models expose large gaps in our knowledge regarding climate damages.59 Substantial uncertainty remains for a variety of IAM parameters.60 In the presence of risk aversion, this deep uncertainty coupled with the possibility of catastrophic climate damages implies that the risk adjustment may need to be very large to account for society's desire to avoid catastrophic climate damages. Each unit of emissions reduction not only decreases the average expected future damages, but also thins the fat tails in damage probability distributions, thereby reducing the likelihood of catastrophic outcomes.61 If the government is risk averse, the SCC should include a large risk premium to account for all of these effects. [EPA-HQ-OAR-2010-0799-9480-A1, pp. 9-10]

The Agencies Should Continually Revise the SCC to Reflect the Most Recent Scientific Knowledge

Since the Working Group report, there have been substantial advances in climate science that should be taken into account in the models that underlie the SCC. Several arguments favor revising the SCC to account for the most recent scientific advances as soon as possible in advance of the final rulemaking. First, professional and legal norms for accurate cost-benefit analysis require doing so. Executive Orders instruct federal agencies to accurately weigh the costs and benefits of regulation and base decisions on "the best reasonably obtainable scientific, technical, [and] economic . . . information."62

Although the stringency of the proposed emissions standards was negotiated prior to the rulemaking,63 and the rule will remain cost-benefit justified even with the underestimated SCC values, developing an accurate cost-benefit analysis for the final rule is still important. Given that the tremendous private benefits of the rule are somewhat controversial (though they are clearly real and should be counted),65 accuracy in the estimation of social benefits will help increase confidence in the judgment that total benefits will outweigh costs. Moreover, in addition to aiding the choice between regulatory alternatives, cost-benefit analysis is a way of presenting information to the public and decisionmakers.66 The analysis shapes the public debate not just about this rule, but about future related rulemakings on climate or efficiency. [EPA-HQ-OAR-2010-0799-9480-A1, p. 10]

Second, regulatory impact analysis often builds off of methodologies established in previous rulemakings. EPA and DOT's regulatory impact analyses in particular have a history of setting a precedent for other federal—and even state—agencies to consider the SCC in their own rulemakings. 67 Even if improving the accuracy of the SCC will not affect the stringency or structure of the present rulemaking, it could influence future emissions and efficiency standards developed in other rulemaking contexts or by other agencies. EPA and NHTSA therefore have a responsibility to include the most accurate SCC values, reflecting the most up-to-date scientific and economic literature, in their final rulemaking. [EPA-HQ-OAR-2010-0799-9480-A1, p. 10]

Third, by incorporating the latest scientific developments, the agencies ensure that their analyses do not fall out of date, and can help encourage climate research. Revising the SCC to account for the most recent scientific developments will signal to researchers that the government cares deeply about better understanding these issues, stimulating additional research into these topics. The agencies can even use the revision as an opportunity to identify key outstanding questions, in order to direct future research. [EPA-HQ-OAR-2010-0799-9480-A1, p. 10]

In its February 2010 report, the Working Group committed to “updating these [initial] estimates as the science and economic understanding of climate change . . . improves” and “revisiting the SCC values within two years or at such time as substantially updated models become available.”68 The agencies can make good on this commitment by ensuring that the SCC used in the final rulemaking is based on the most recent climate science.69 [EPA-HQ-OAR-2010-0799-9480-A1, pp. 10-11]

Conclusion

The agencies should increase their estimates of climate benefits to more accurately value the chance of catastrophic damages. Substantial economic literature, including much published in the last two years, supports the conclusion that current models do not place enough emphasis on catastrophic scenarios and, consequently, that some adjustment to the calculation of benefits is necessary. Disagreement over the exact size of that adjustment does not suggest the risk of catastrophe should be valued at zero. [EPA-HQ-OAR-2010-0799-9480-A1, p. 20]

The agencies should increase their estimates of climate benefits to account for risk aversion. Climate change is a categorically different kind of social problem: no single government can self-insure against the risk of irreversible, planet-wide damages. The government, therefore, should be risk averse toward climate change. Though the degree of risk society faces is a subject of contention, most economists believe there is some non-negligible amount of risk that must be accounted for. A risk premium should be incorporated, either as an adder to the value of climate benefits, or as a downward adjustment to discount rates. [EPA-HQ-OAR-2010-0799-9480-A1, p. 20]

The agencies should continually revise their estimates of climate benefits to reflect the most recent scientific and economic knowledge. Even if a better estimate of benefits will not change the stringency or structure of the proposed rule, accuracy remains important. Professional and legal norms for economic analysis require it; accurate benefits estimates will increase confidence in the justifications for the rule and inform the public debate; and the agencies’ impact analysis will set a precedent for future rulemakings. The agencies should take the lead on adjusting estimates to account for risk and catastrophic damages, as well as the latest climate science. [EPA-HQ-OAR-2010-0799-9480-A1, p. 20]

The agencies should make several other improvements in the valuation of climate benefits, including development of non-carbon dioxide estimates, incorporation of potential benefit revisions in the mid-term evaluation process, and accounting for the net upstream emissions from electric vehicles. [EPA-HQ-OAR-2010-0799-9480-A1, p. 20]

---

2 INTERAGENCY WORKING GROUP ON SOCIAL COST OF CARBON, U.S. GOV'T, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12,866, at 2 (2010) [hereinafter "WORKING GROUP REPORT"].

3 Id.

4 Id. at 5.

5 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 76 Fed. Reg. 74,854, 74,895, 75,292 fn. 774 (proposed Dec. 1, 2011) [hereinafter "Proposed Rule"].

6 WORKING GROUP REPORT, supra note 2, at 29-31; Proposed Rule, supra note 5, at 75,127.

7 Proposed Rule, supra note 5, at 74,930, 74,933.

8 See NAT'L RES. COUNCIL, NAT'L ACAD. OF SCI., HIDDEN COSTS OF ENERGY: UNPRICED CONSEQUENCES OF ENERGY PRODUCTION AND USE 256-57 (2009).

9 See Martin Weitzman, On Modeling and Interpreting the Economics of Catastrophic Climate Change, 91 REV. ECON. & STAT. 1, 1 (2009).

10 See NAT'L RES. COUNCIL, supra note 8, at 293; Martin Weitzman, Fat-Tailed Uncertainty in the Economics of Catastrophic Climate Change, 5 REV. ENVTL. ECON. & POL'Y 275 (2011).

11 See generally Weitzman, supra note 9.

12 See generally Richard S. J. Tol, Is the Uncertainty About Climate Change Too Large for Expected Cost-Benefit Analysis?, 56 CLIMATE CHANGE 265 (2003).

13 NAT'L RES. COUNCIL, supra note 8, at 256-57.

14 Compare Weitzman, supra note 9, with Tol, supra note 12.

15 See WORKING GROUP REPORT, supra note 2, at 29-31. The Working Group does not completely differentiate between the discrete effects of risk aversion and expected utility

calculations when considering catastrophic damages, most likely because the scholars writing on these issues often consider both effects simultaneously.

16 WILLIAM NORDHAUS, A QUESTION OF BALANCE: WEIGHING THE OPTIONS ON GLOBAL WARMING POLICIES (2008); William D. Nordhaus, An Analysis of the Dismal Theorem (Cowles Found., Discussion Paper No. 1686, 2009). For an update, see William D. Nordhaus, The Economics of Tail Events with an Application to Climate Change, 5 REV. ECON. & POL'Y 240 (2011).

17 Robert S. Pindyck, Uncertain Outcomes and Climate Change Policy (NBER Working Paper No. 15,259, 2009). For more recent work, see Robert S. Pindyck, Fat Tails, Thin Tails, and Climate Change Policy, 5 REV. ENVTL. ECON. & POL'Y 258 (2011).

18 Stephen C. Newbold & Adam Daigneault, Climate Response Uncertainty and the Benefits of Greenhouse Gas Emissions, 44 ENVTL. & RES. ECON. 351 (2009).

19 See, e.g., Weitzman, supra note 10, at 280; Carolyn Kousky, Robert E. Kopp & Roger Cooke, Risk Premia and the Social Cost of Carbon: A Review 5 (Economics: The Open-Access, Open-Assessment E-Journal, Discussion Paper No. 2011-19, 2011).

20 See Weitzman, supra note 9, at 16 (finding that, in some circumstances, the possibility of catastrophic damages will result in a theoretical infinite willingness to pay to avoid climate catastrophes).

21 See generally Newbold & Daigneault, supra note 18.

22 See Pindyck, Uncertain Outcomes and Climate Change Policy, supra note 17, at 3-4.

23 WORKING GROUP REPORT, supra note 2, at 29.

24 See id. at 31.

25 See, e.g., Ctr. for Biological Diversity v. NHTSA, 538 F.3d 1172, 1200 (9th Cir. 2008) ("[W]hile the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero.").

26 Pycroft et al., A Tale of Tails: Uncertainty and the Social Cost of Carbon Dioxide (Economics: The Open-Access, Open-Assessment E-Journal, Discussion Paper 2011-36, 2011) (finding that tail shape can change the SCC dramatically and suggesting fatter tails may be more reasonable).

27 Antony Millner, On Welfare Frameworks and Catastrophic Climate Risks, in SOCIAL SCIENCE RESEARCH NETWORK (2011) (arguing that satisfactory treatment of climate modeling requires consideration of catastrophe).

28 Frank Ackerman et al., Fat Tails, Exponents, Extreme Uncertainty: Simulating Catastrophe in DICE, 69 ECOLOGICAL ECON. 1657 (2010) (finding that plausible increases in both the climate sensitivity and damage exponent parameters results in disastrous economic decline).

29 Simon Dietz, High Impact, Low Probability? An Empirical Analysis of Risk in the Economics of Climate Change, 108 CLIMATE CHANGE 519 (2011) (discussing one method of bounding damages to avoid infinite willingness to pay for abatement).

30 Michael D. Gerst, Richard B. Howarth & Mark E. Borsuk, Accounting for the Risk of Extreme Outcomes in an Integrated Assessment of Climate Change, 38 ENERGY POL'Y 4540 (2010) (finding that without aggressive abatement, the probability of catastrophic damages is high).

31 See Weitzman, supra note 9; Tol, supra note 12. Participants at an EPA/DOE workshop following the interagency process likewise noted that existing research already suggests that IAMs could better assess high-end warming scenarios. ICF INT'L, DRAFT WORKSHOP REPORT: IMPROVING THE ASSESSMENT AND VALUATION OF CLIMATE CHANGE IMPACTS FOR POLICY AND REGULATORY ANALYSIS—PART 1, at 6 (2011), available at http://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0564-50.pdf/$file/EE-0564-50.pdf.

32 See Gary W. Yohe & Richard S. J. Tol, The Stern Review and the Economics of Climate Change: An Editorial Essay, 89 CLIMATE CHANGE 231, 237 (2008).

33 See generally Weitzman, supra note 9.

34 See, e.g., Pindyck, Uncertain Outcomes and Climate Change Policy, supra note 17.

35 See Pycroft et al., supra note 26.

36 Some of the literature on risk premiums distinguishes risk and uncertainty based on Knight's definitions: risk involves known probabilities, while uncertainty involves the inability to determine the probabilities of different outcomes. FRANK H. KNIGHT, RISK, UNCERTAINTY, AND PROFIT (1921). However, the distinction between uncertainty and risk is not always clear. We do know that climate damages are not certain. We also know that people are willing to pay to increase the certainty of damages. For the sake of simplicity, these comments recommend a "risk" premium to account for the affects of aversion to both risk and uncertainty.

37 See Sonia Quiroga & Ana Iglesias, A Comparison of the Climate Risks of Cereal, Citrus, Grapevine and Olive Production in Spain, 101 AGRICULTURAL SYSTEMS 91, 98-99 (2009) (specifying risk premium in relation to risk aversion among Mediterranean agricultural producers); Howard C. Kunreuther & Erwann O. Michel-Kerjan, Climate Change, Insurability of Large-Scale Disasters, and the Emerging Liability Challenge, 155 U. PA. L. REV. 1795 (2007) (discussing calculations for insurance policies amid climate change); Alicia N. Rambaldi & Phil Simmons, Response to Price and Production Risk: The Case of Australian Wheat, 20 J. FUTURES MKTS. 345 (2000). See also Joseph E. Aldy et al., Designing Climate Mitigation

Policy 14 (Res. for the Future, Discussion Paper 08-16, May 2009) (noting that proper risk premium estimate is the subject of dispute, and that it varies with estimates of the marginal utility of consumption net of climate damages); David Anthoff, Richard S. J. Tol, & Gary W. Yohe, Risk Aversion, Time Preference, and the Social Cost of Carbon, 4 ENVTL. RESEARCH LETTERS 1 (2009) (distilling from historical data values for the elasticity of marginal utility with respect to consumption, and identifying salience of uncertainty in SCC calculation).

38 WORKING GROUP REPORT, supra note 2, at 31 (citing Anthoff et al., supra note 37, at 1 ("[T]he assumed rate of risk aversion is at least as important as the assumed rate of time preference in determining the social cost of carbon.")).

39 Geoffrey Heal & Bengt Kristrom, Uncertainty and Climate Change, 22 ENVTL. RESOURCE ECON. 3 (2003) (analogizing climate change to insurance markets).

40 Geoffrey Heal, The Economics of Climate Change: A Post-Stern Perspective, 96 CLIMATE CHANGE 275 (2009) (identifying the effects of uncertainty and risk aversion and suggesting that society will pay to avoid climate change risks).

41 Magnus Hennlock, Robust Control in Global Warming Management: An Analytical Dynamic Integrated Assessment (University of Gothenberg, Working Papers in Economics No. 354, 2009) (finding that the preference for avoiding uncertainty entails a higher SCC due to the need for an ambiguity premium).

42 Richard S. J. Tol, The Social Cost of Carbon: Trends, Outliers, and Catastrophes 2 ECONOMICS: THE OPEN-ACCESS, OPEN-ASSESSMENT E-JOURNAL (2008).

43 Yohe & Tol, supra note 32.

44 Martin L. Weitzman, Additive Damages, Fat-Tailed Climate Dynamics, and Uncertain Discounting, 3 ECONOMICS: THE OPEN-ACCESS, OPEN-ASSESSMENT E-JOURNAL 1 (2009); and Martin L. Weitzman, GHG Targets as Insurance Against Catastrophic Climate Damages (NBER, Working Paper No. 16136, 2010).

45 See, e.g., Gary Yohe, Toward an Integrated Framework Derived from a Risk-Management Approach to Climate Change, 95 CLIMATE CHANGE 325, 329 (2009) (suggesting the need to account for risk and uncertainty in climate change policy); Yohe & Tol, supra note 32, at 237 (arguing that the optimal carbon tax must be augmented by a non-zero risk premium); Heal & Kristrom, supra note 39; Heal, supra note 40; Hennlock, supra note 41; Antony Millner, Simon Dietz, & Geoffrey Heal, Ambiguity and Climate Policy (Center for Climate Change Economics and Policy, Working Paper No. 28, 2010) (finding that aversion to uncertainty in some cases leads to very large "ambiguity" premiums); Gerst et al., supra note 30 (showing that ignoring uncertainty underestimates climate damages); and Robert E. Kopp et al., The Influence of the Specification of Climate Change Damages on the Social Cost of Carbon (Economics: The Open-Access, Open-Assessment E-Journal, Discussion Paper No. 2011-22, 2011) (finding that uncertainty and risk aversion can significantly increase the SCC). Much of this literature review is based on Kousky, supra note 19. See also Ctr. for Biological Diversity, supra note 25.

46 See, e.g., Anthoff et al., supra note 37, at 5 (finding SCC estimates over $5,000 per ton of carbon dioxide for some parameter values); Millner et al., supra note 45; Kousky et al., supra note 19, at 14 (concluding after surveying the literature on risk and uncertainty premiums that these premiums could be "quite large").

47 See generally Yohe, supra note 45; Yohe & Tol, supra note 32, at 237 ("While reasonable people disagree how much of a risk premium should be placed on top of the Pigou tax, it should be clear that no reasonable person would argue that this premium should be zero."); Kousky et al., supra note 19. See also Klaus Keller, Gary Yohe, & Michael Schlesinger, Managing the Risks of Climate Thresholds: Uncertainties and Information Needs, 91 CLIMATE CHANGE 5 (2008) (discussing the proper portfolio of mitigation policies).

48 See WORKING GROUP REPORT, supra note 2, at 31.

49 See id. at 30 (citing OFFICE OF MGMT. & BUDGET, EXECUTIVE OFFICE OF THE PRESIDENT, CIRCULAR A-4, 42 (2003)).

50 See Weitzman, supra note 9, at 11.

51 See WORKING GROUP REPORT, supra note 2, at 30.

52 See Heal, supra note 40, at 287.

53 See Tol, supra note 42, at 6.

54 See Anthoff et al., supra note 37, at 5-6.

55 See id. at 6.

56 See, e.g., Dietz, supra note 29.

57 See, e.g., Robert Mendelsohn, Is the Stern Review an Economic Analysis?, 2 REV. ENVTL. ECON. & POL'Y 45 (2008).

58 Reducing the discount rate is one way to account for risk aversion. See Kousky et al., supra note 19, at 4. However, the effect of emissions abatement investments on the overall level of risk in the economy does not affect the discount rate as described by modern portfolio theory. There are also independent reasons for lowering the discount rates used by the Working Group, see Letter from Institute for Policy Integrity & Environmental Defense Fund, to Lisa P. Jackson, Administrator, EPA, 15 (Nov. 27, 2009) available at http://www.policyintegrity.org. Any downward adjustment to the discount rate to account for risk should not diminish those independent reasons to also lower the discount rate.

59 See Millner et al., supra note 45.

60 See, e.g., Pindyck, Uncertain Outcomes and Climate Change Policy, supra note 17; Newbold & Daigneault, supra note 18.

61 See, e.g., Kousky et al., supra note 19, at 3.

62 Exec. Order 12866, § 1(b)(6)-(7); Exec. Order 13563 § 1(c) ("each agency is directed to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible").

63 WHITE HOUSE, DRIVING EFFICIENCY (2011), available at http://www.whitehouse.gov/sites/default/files/ fuel_economy_report.pdf.

65 See infra Part II.

66 See Nathaniel Keohane, The Technocratic and Democratic Functions of the CAIR Regulatory Analysis, in REFORMING REGULATORY IMPACT ANALYSIS at 33 (Harrington, W., Heinzerling, L., & Morgenstern, R. eds., 2009).

67 See WORKING GROUP REPORT, supra note 2, at 3-4.

68 WORKING GROUP REPORT, supra note 2, at 3.

69 In its Preliminary Regulatory Impact Analysis from November 2011, NHTSA simply repeated the two-year timeline without noting any concrete next steps. See NHTSA, PRIA, at 654 (2011), http://www.nhtsa.gov/staticfiles/rulemaking/ pdf/cafe/2017-25_CAFE_PRIA_final.pdf. The proposed rule itself even more vaguely refers to a revision "in the next few years." Proposed Rule, supra note 5, at 75,127. Though EPA and Department of Energy have co-hosted two workshops over the past two years bringing together top climate modelers, see http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/ ClimateEconomics.html, the agencies have not publicly committed to any specific plans to reconvene the interagency working group and update the SCC as of the date of these comments.

70 WORKING GROUP REPORT, supra note 2, at 12 ("The goal is to develop these estimates by the time we issue revised SCC estimates for carbon dioxide emissions.").

71 Id.

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 33.]

The estimated benefits of this proposal include a reduction in oil consumption of 4 billion barrels and a reduction in greenhouse gas emissions of 2 billion metric tons, fuel savings on the order of 347 to $444 billion, at a monetized net benefit to society in the range of 311 to $421 billion.

Organization: Natural Resources Defense Council (NRDC)

EPA and NHTSA should use a social cost of carbon estimated using an improved methodology. NRDC's recommendations authored by Dr. Laurie Johnson, Chief Economist of NRDC's Climate and Clean Air Program, have been submitted as a separately docketed item from these broader comments. [See pp. 1-24 of Docket number EPA-HQ-OAR-2010-0799-9472-A1 for more detail on social cost of carbon.] [EPA-HQ-OAR-2010-0799-9472-A2, p. 4]

In the Regulatory Impact Analysis accompanying the proposed light-duty vehicle greenhouse gas and CAFE rulemaking, EPA and DOT included benefits estimates for CO_2 emission reductions —a monetized value of the marginal benefit of reducing a ton of CO_2—using the social cost of carbon (SCC) as estimated by the Obama Administration's Interagency Working Group on the Social Cost of Carbon (February 2010). Because the use of the Working Group's SCC in this proposed ruling has implications beyond this regulation, we are submitting these comments separately from our more specific comments on the proposed motor vehicle standards. Most of our comments are recommendations for improving the methodology for estimating the SCC for future regulations. NRDC recognizes that implementing many of these recommendations will not be possible within the time frame of this ruling. Nevertheless, they should inform what the agencies decide to do in both the short- and longer-term. [EPA-HQ-OAR-2010-0799-9472-A1, p. 2]

Our recommendations regarding the GWP method and SCC are summarized as follows [*Note: NRDC recommendations regarding the GWP method are listed above in Section 18.4.1.1*]:

2) Improved SCC.

a. Use the updated versions of the social cost of carbon models that were used for the 2010 estimates to re-estimate the SCC for this rulemaking (Recommendation #4). [EPA-HQ-OAR-2010-0799-9472-A1, p. 5]

b. Use a lower discount rate. We recommend 0.7%, the average return on 6 month U.S. Treasury Notes (Recommendation #5), for several reasons (see discussions in Section I.2. and d) and e) in Section II. At a minimum, whatever discount rates the agencies adopt, it needs to include an estimate of the SCC using the government's own recommended lower bound sensitivity value for intergenerational discounting, of 1% (OMB, Circular A-4).5 The choice by the Working Group not to use the lower bound was not justified, and should not be continued. If the agencies elect not implement this recommendation, we request it provide a justification (Recommendation #6). [EPA-HQ-OAR-2010-0799-9472-A1, p. 5]

c. Short of our preferred 0.7% rate, the agencies should at least use a more representative set of discount rates that take into account long run uncertainty in interest rates. The range should include Weitzman6 and UK Greenbook7 declining discount rate schedules, not just the Newell-Pizer estimate already used by the Working Group (Recommendation #7). If the agencies elect not implement this recommendation, we request it provide a justification. [EPA-HQ-OAR-2010-0799-9472-A1, pp. 5-6]

3) Transparency of SCC. EPA should provide a more transparent presentation of the social cost of carbon used in the calculations, such that it better conveys the limitations of the models to handle catastrophic risks and many damage categories, by

a. Providing a detailed list of damages included and excluded from the models in tabular format (Recommendation #8). If the agencies elect not implement this recommendation, we request it provide a justification.

b. Providing the 99th percentile social cost of carbon estimates (Recommendation #9). If the agencies elect not implement this recommendation, we request it provide a justification. [EPA-HQ-OAR-2010-0799-9472-A1, p. 6]

4) Recommendations for the Interagency Working Group. The agencies should recommend to the Interagency Working Group, along with Recommendations above, that the Group:

a. Incorporate risk aversion according to different available methodologies as summarized in Kosky and Kopp (2011)8 (Recommendation #10). [EPA-HQ-OAR-2010-0799-9472-A1, p. 6]

b. In addition to incorporating risk aversion, better integrate the very high and catastrophic damages to which individuals are risk averse into all three models. Specifically, the Working Group should 1) use Weitzman's analysis (2009)9 to 'extend the grid' in the Monte Carlo simulations; 2) for catastrophic outcomes, consider using as an estimate of damages Weitzman's implied ?value of statistical life on Earth as we know it,? the VSL (value-of-a-statistical life), multiplied by world population; 3) reduce the amount of low cost adaptation assumed in the models; and 4) modify damage functions to reflect cross-sectoral damages (Recommendations #11, 12, 13, 14). [EPA-HQ-OAR-2010-0799-9472-A1, p. 6]

c. Conduct sensitivity analyses equity weighting the SCC according to different available methods (Recommendations #15, 16). [EPA-HQ-OAR-2010-0799-9472-A1, p. 6]

d. Review the literature for estimates of the ratio between non-use and use values, and develop a methodology to apply a multiplication factor (or factors) to relevant use values included in the models (Recommendation #17). [EPA-HQ-OAR-2010-0799-9472-A1, p. 6]

e. Dedicate full time staff to collecting and reviewing new climate science and economic modeling on an ongoing basis, and regularly incorporate these developments into the SCC models. As they become available, post findings on a public website with links to sources (Recommendations #18, 19). [EPA-HQ-OAR-2010-0799-9472-A1, p. 6]

f. Update the models to reflect recent research on agricultural changes, which suggest the CO_2 fertilization is overestimated in the FUND model, and that much, if not all, fertilization benefits may be cancelled out by negative impacts on agriculture (e.g. extreme heat, pests, and weeds) (Recommendation #20). [EPA-HQ-OAR-2010-0799-9472-A1, p. 7]

g. Examine whether the upper ends of the 612 to 889 ppm of CO_2 in the four business-as-usual scenarios used by the Working Group reflect current worse-case estimates (Recommendation #21). [EPA-HQ-OAR-2010-0799-9472-A1, p. 7]

Section I below provides a more detailed summary discussion of these comments and recommendations, while Sections II and III provide extended discussions of discounting and equity weighting, and catastrophic risk representation in Monte Carlo analysis, respectively. [See Docket number EPA-HQ-OAR-2010-0799-9472-A1 pp. 8-24 for Sections I, II, and III.] [EPA-HQ-OAR-2010-0799-9472-A1, p. 7]

---

4 Shindell, DT, Faluvegi, G, Koch, DM, Schmidt, GA, Unger, N and Bauer, SE (2009). Improved attribution of climate forcing to emissions. Science vol 326: 716-718.

5 In 2008, EPA suggested an even lower bound ,of 0.5%.Technical Support Document on Benefits of Reducing GHG Emissions. U.S. Environmental Protection Agency, June 12, 2008. As EPA notes in the beginning of the document, it began developing most of the information in the report in support of the Executive Order 13432 for developing CAA (Clean Air Act) regulations that would reduce GHG emissions from motor vehicles.

6 Weitzman, M (2001). Gamma Discounting. American Economic Review, American Economic Association, vol. 91(1): 260-271.

7 Lowe, J (2008). Intergenerational wealth transfers and social discounting: supplementary greenbook guidance. UK Treasury. http://www.hm-treasury.gov.uk/d/4(5).pdf. Note that the schedule in this supplement to the greenbook subtracts out an implicit positive value for the pure rate of time preference, appropriate for intergenerational discounting.

8 Kousky, C, and Kopp, RE (2011). Risk Premia and the Social Cost of Carbon: A Review. Economics: The Open-Access, Open-Assessment E-Journal. Discussion Paper No. 2011-19. http://www.economics-ejournal.org/economics/discussionpapers/2011-19.

9 Weitzman, M (2009). On Modeling and Interpreting the Economics of Catastrophic Climate Change. Review of Economics and Statistics 9(1): 1-19

Response:

EPA appreciates the commenters' recommendations to modify the methodology underlying the SCC estimates and has considered each one in the context of this rulemaking. The interagency group committed to update the SCC estimates as the science and economic understanding of climate change and its impacts on society improves over time. To help motivate and inform this process, DOE and EPA hosted a series of workshops. The first workshop focused on conceptual and methodological issues related to integrated assessment modeling and valuing climate change impacts, along with methods of incorporating these estimates into policy analysis.[83] The second workshop reviewed research on estimating impacts and valuing damages on a sectoral basis.[84]

In sum, EPA has determined that the SCC methodological recommendations require additional research, review, and public comment before it can apply them to a rulemaking context. EPA has therefore presented the SCC estimates developed through the 2009-2010 interagency process in this rulemaking. EPA will continue to consider these comments and will share the recommendations with the interagency group for consideration in future reviews of the current SCC estimates.

Regarding comments that the agencies should rethink the way they calculate emissions from alternative fuel vehicles, please see section 6.5 of this document for EPA's response.

The remainder of this section provides more detailed responses to the recommendations.

Recommendations regarding treatment of uncertainty, catastrophic impacts, and risk.

The interagency group specified three parameters—climate sensitivity, socioeconomic and emissions trajectories, and discount rate—as inputs into three integrated assessment models, leaving other key parameters unchanged from those specified by the authors but ran the models probabilistically for purposes of formal uncertainty analysis in the interagency modeling exercise. A probability distribution was specified for climate sensitivity and used as an input in the three models. A probability distribution was not specified for the other two parameters because of uncertainty about how to model them probabilistically for purposes of formal uncertainty analysis. For example, while models can project potential emissions pathways, assigning probability weights to different states of the world in an analytically rigorous way proved challenging given the dearth of information on the likelihood of a full range of future socio-economic pathways. Likewise, there is broad disagreement in the published literature on what discount rate is appropriate to use in an intergenerational setting. Therefore, the modeling exercise used multiple scenarios that span a range of socio-economic parameters and multiple values for the discount rate.

EPA recognizes the need to review how the models incorporate catastrophic damages and to account for uncertainties and risks in its analysis. EPA also agrees that it is important to account for these issues and notes that the rulemaking documents, in particular the SCC TSD, provide a thorough discussion about these considerations, the ongoing challenge to incorporate them into the SCC estimates, and the implications for the benefits analysis (for example, see Section V of the SCC TSD).

EPA has continued to explore the literature and assess it in the context of its SCC analysis. For example, the DOE/EPA workshop series on integrated assessment modeling reviewed the emerging literature about treatment of economic catastrophes and risk aversion. Overall, the discussions revealed progress in understanding the implications of potential

[83] For workshop proceedings, see http://go.usa.gov/426
[84] For workshop proceedings, see http://go.usa.gov/42F

catastrophes while underscoring the need for additional research regarding optimal ways to incorporate such information into regulatory rulemakings. Likewise, EPA carefully reviewed the commenters' synthesis of the emerging literature regarding treatment of risk aversion, catastrophic impacts, and the calculation of a risk premium, but continues to believe that additional deliberation is required to better characterize these issues and identify the optimal way to modify the interagency group's methodology and incorporate it in rulemakings. Furthermore, other federal agencies use the SCC estimates to analyze benefits of rulemakings and it is important to ensure consistency in the SCC estimates used across the government analyses. This is not consistency for the sake of consistency, but rather using well-documented, scientifically supported estimates, while at the same time continuing the iterative process of analyzing, reviewing, and updating the SCC to reflect best available science. Therefore, EPA will continue to research these important issues and to include the submitted comments in any review process to update the SCC estimates.

Recommendations regarding model vintage.

EPA has also begun to explore the updated versions of DICE, FUND, and PAGE. Additional analysis of the model updates is required before EPA can incorporate them in rulemakings. Furthermore, other federal agencies use the SCC estimates to analyze benefits of rulemakings and it is important to ensure consistency in the SCC estimates used across the government analyses.

Recommendations regarding CO_2 fertilization.

EPA considered the comments regarding CO_2 fertilization benefits in FUND and has determined that additional research would be required to implement these recommendations. EPA has recognized the need for a thorough review of damage functions in all three models that the interagency group used to estimate SCC. In addition to supporting the 2010-2011 DOE/EPA workshop series that explored treatment of impacts in the models, EPA initiated a review of the literature in agriculture and other sectors to help researchers more easily improve representation of damages. Consistent with the commenter's recommendation, EPA is particularly interested in examining recent publications about the role of assumptions regarding carbon fertilization. EPA appreciates the references provided by the commenter and will continue to analyze the components of agricultural impacts.

In the meantime, EPA determined that modifying the FUND structure would be counterproductive, given that the latest version incorporates changes in the estimation of agricultural impacts. These changes are undergoing peer review and EPA looks forward to exploring these changes.

Furthermore, introducing changes beyond those implemented by the model authors would conflict with the methodology established by the interagency working group. A key objective of the interagency process was to enable a consistent exploration of the three models while respecting the different approaches to quantifying damages taken by the key modelers in the field. After conducting an extensive literature review, the interagency group selected three sets of input parameters (climate sensitivity, socio-economic and emissions trajectories, and discount rates) to use consistently in each model. All other model features were left unchanged, relying on the model developers' best estimates and judgments.

Recommendations regarding omitted impacts.

EPA disagrees with the comments that the agency has not responded to repeated requests for more information about how the models treat climate change impacts, i.e., which impacts are therefore included or excluded from the monetized estimates. Specifically, EPA has published written responses to this same comment in other rulemakings—see Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, EPA Response to Comments Document for Joint Rulemaking and Greenhouse Gas Emission Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles, EPA Response to Comments Document for Joint Rulemaking. In short, it is not possible at this time to provide a precise list of each model's treatment (i.e., included, excluded) of climate impacts. Instead, the SCC TSD presents a robust discussion of this key analytical issue, e.g., how each model estimates climate impacts, the known parameters and assumptions underlying those models, and the implications of incomplete treatment of impacts (catastrophic and non-catastrophic) for the SCC estimates. Moreover, the discussion in the SCC TSD underscores the difficulty in accurately distilling the models' treatment of impacts in table-form. Most notably, the use of aggregate damage functions—which consolidate information about impacts from multiple studies—in two of the models poses a challenge in listing included impacts. For example, within the broad agricultural impacts category, some of the sub-grouped impacts are not explicitly modeled but are highly correlated to other subcategories that are explicitly modeled. Therefore, it may be misleading to identify these kinds of impacts as either "included" or "omitted" from the model. Along those lines, impacts may be included in models but not directly; the Dynamic Integrated Climate and Economy (DICE) model represents adaptation implicitly through the choice of studies used to calibrate the aggregate damage function, and the Climate Framework for Uncertainty, Negotiation, and Distribution (FUND) model includes adaptation both implicitly and explicitly (see the SCC TSD for details).

Recommendations regarding discount rate.

Regarding the recommendations for discount rate selection, EPA finds it to be defensible and transparent given its consistency with the standard contemporary theoretical foundations of benefit-cost analysis. The basis for the current discounting approach is discussed in detail in the SCC TSD. In sum, the interagency group applied three constant certainty-equivalent discount rates (2.5, 3, and 5 percent) to the SCC estimates to account for various perspectives about risk and uncertainty. The upper value of 5 percent accounts for the view that there may be a high correlation between climate damages and market returns while the rest of the SCC analysis centers on a discount rate consistent with concerns about risk aversion. The SCC TSD also summarizes the consideration of the literature about handling uncertainty in discounting (e.g., Newell and Pizer (2003), Weitzman (2001), and the UK's "Green Book" for regulatory analysis) and concludes that the proper way to model discount rate uncertainty remains an active area of research.

In addition, EPA finds this approach to be consistent with OMB Circular A-4. Circular A-4 discusses the analytical challenges for discounting in an intergeneration context and concludes that agencies "might consider a further sensitivity analysis using a lower but positive discount rate in addition to calculating net benefits using discount rates of 3 and 7 percent." Specifically, Circular A-4 states that "estimates of the appropriate discount rate" in an intergenerational context ranged from 1 to 3 percent." Two of the three discount rates used in the interagency exercise fall within this range.

However, EPA recognizes the limitations of the discounting approach used in the interagency modeling exercise. Accordingly, EPA funded a workshop on discounting in September 2011 that invited world-recognized experts to discuss how the benefits and costs of regulations should be discounted for projects with long horizons. In particular, it explored what principles should be used to determine the rates at which to discount the costs and benefits of regulatory programs when costs and benefits extend over very long horizons. The charge questions that were the subject of the workshops discussion focused on three main areas: (1) whether and in what context it is appropriate to apply a Ramsey discounting framework in an intergenerational setting; (2) whether and how to directly estimate discount rates over long time horizons; and (3) how to apply discounting in a regulation where some costs and benefits accrue intra-generationally while others accrue inter-generationally. See http://rff.org/Events/Pages/Intergenerational-Discounting-Workshop.aspx for a summary of the main discussion points. EPA is in the process of evaluating next steps with regard to possible methodological improvements in intergenerational discounting.

Recommendations regarding SCC presentation.

Regarding the recommendation to provide the 99th percentile estimates of the social cost of carbon, EPA notes that these estimates are presented in the Appendix, Table A2, in the SCC Technical Support Document, "Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 SCC TSD," (SCC TSD), which is referenced in both the preamble and RIA. The SCC provides extensive information about the SCC estimates and the underlying parameters, which serve as the basis for the estimates of methane co-benefits. For example, the SCC TSD shows how SCC values for 2010 vary across model, scenario, and discount rate; it also presents the distribution of SCC estimates, including benefit estimates at the 95th and 99th percentiles for each model. EPA has determined that it is more appropriate to place such detailed technical information in the rulemaking's technical supporting documents, i.e., the SCC TSD, rather than the co-benefits section of the RIA, which gives an overview of the calculation as well as a detailed table with the methane co-benefit estimates. The RIA also provides references to the SCC TSD for those seeking further information about the distribution.

Recommendations regarding global estimates of SCC.

EPA agrees with the comment regarding use of a global SCC value and notes that the agencies have in fact used global estimates to assess the benefits of this rulemaking. See preamble Section III.H.6 and Chapter 7 of the RIA for the SCC estimates.

18.4.1.3 Comments about Social Cost of CO_2 (Opposition to estimates)

Organization: Institute for Energy Research (IER)

Furthermore, EPA's cost-benefit analysis utilizes the "social cost of carbon." The estimates developed through EPA's social cost of carbon analysis are arbitrary and capricious as the social cost of carbon is an unsupportable metric for use in federal rulemaking. Even on its own terms, the social cost of carbon estimate is inapplicable for EPA's analysis, because of what is called "leakage" in the climate change literature. Specifically, EPA ignores the possibility that its rule will increase greenhouse gas emissions outside of the United States, through mechanisms such as a lower world price of oil due to restricted American demand. [EPA-HQ-OAR-2010-0799-9573-A1, p. 2]

In addition to basing its case on an assumption that households and businesses irrationally fail to reap advantageous fuel economy savings, EPA's estimates also incorrectly deploy the concept of "Social Cost of Carbon" (SCC) from the climate change literature. Although the SCC is a useful theoretical concept in discussions of worldwide carbon taxes or other frameworks, there are several problems with EPA's invocation of the concept in the context of US-based fuel economy mandates. [EPA-HQ-OAR-2010-0799-9573-A1, p. 9]

5. The "Social Cost of Carbon" is used improperly in the EPA's assessment

Besides the problems with overriding consumers' voluntary choices, part of EPA's analysis is methodologically flawed because EPA uses the "social cost of carbon" in its cost-benefit analysis. As a concept, the social cost of carbon has the appearance of specificity without necessarily reflecting reality in a meaningful way. [EPA-HQ-OAR-2010-0799-9573-A1, p. 21]

EPA and NHTSA explain the social cost of carbon thusly:

EPA has assigned a dollar value to reductions in CO_2 emissions using global estimates of the social cost of carbon (SCC). The SCC is an estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change. [EPA-HQ-OAR-2010-0799-9573-A1, p. 21]

EPA argues that by reducing greenhouse gas emissions, this rule would produce benefits, as measured by the social cost of carbon, of a discounted present value of $32.8 billion (using a 5% discount rate) to $522 billion (using a 3% discount rate) and 95th percentile social cost of carbon assumption. But these amounts are almost certainly overestimates. As EPA admits, this rule will only reduce global temperature by 0.0076–0.0184 °C by 2100. Even in the scenario with the most warming, a 0.02°C reduction in temperature is not enough to have any impact on the damages EPA claims will occur with higher temperatures—i.e. "changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change." Without having an impact on these damages, there are no real benefits. [EPA-HQ-OAR-2010-0799-9573-A1, p. 21]

In the economics of climate change literature, the social cost of carbon (SCC) is calculated by reducing the absolute amount of greenhouse gas emissions by one (carbon-dioxide-equivalent) ton and estimating the corresponding reduction in the present-discounted value of total long-run climate damages. [EPA-HQ-OAR-2010-0799-9573-A1, pp. 21-22]

EPA's cost-benefit methodology assumes that a proposal that reduces greenhouse gas emissions by a certain quantity R will therefore yield social benefits (from reduced climate damages) of R x SCC. However, this overstates the benefits, because of a phenomenon called "leakage." The calculation of benefits using SCC assumes that if the United States foregoes greenhouse gas emissions as a result of this rule, then those emissions will not happen. This fails to include the impact of these rules outside the United States. Specifically, it is not the case that global emissions from all other sources will be unaffected by the proposed rules. For example, the new rules (and accompanying higher prices for new vehicles) will lead motorists to drive their older, less fuel efficient cars for longer than they otherwise would have, and in the extreme more people will emigrate to jurisdictions that have looser standards and buy more vehicles from exempt manufacturers than would otherwise have occurred. Another major consideration is that reduced U.S. demand for oil will depress world oil prices and lead to greater fuel use by motorists around the world. In the aggregate and over several decades, the actual reduction in global emissions will be lower—and possibly significantly lower—than a naïve estimate would indicate. [EPA-HQ-OAR-2010-0799-9573-A1, p. 22]

EPA's cost-benefit analysis utilizes the "social cost of carbon," which estimates in this proposed rule demonstrate to be an arbitrary and unsupportable metric for use in federal rulemaking. [EPA-HQ-OAR-2010-0799-9573-A1, p. 23]

Response:

EPA disagrees with the commenter's characterization of the SCC as an "unsupportable metric for use in federal rulemaking." While there are inherent uncertainties associated with modeling climate and economic systems over long time spans, the SCC estimates used in the rulemaking analysis were developed from three integrated assessment models that synthesize available scientific and economic research and have been used in the IPCC assessment. Integrated assessment models are particularly well suited to the estimation of SCC because they combine climate processes, economic growth, and feedbacks between the climate and global economy into a single modeling framework. See the SCC TSD for a complete discussion about the three models used to develop the SCC estimates. See also Coalition for Responsible Regulation v. EPA, No. 09-1322 (D.C. Cir. June 26, 2012) slip op. p. 27 ("State and Industry Petitioners assert that EPA 'delegated' its judgment to the IPCC, USGCRP, and NRC by relying on these assessments of clime-change science. This argument is little more than a semantic trick….EPA simply did here what it and other decision-makers often must do to make a science-based judgment: it sought out and reviewed existing scientific evidence to determine whether a particular finding was warranted. It makes no difference that much of the scientific evidence in large part consisted of 'syntheses' of individual studies and research. Even individual studies and research papers often synthesize past work in an area and then build upon it. This is how science works. EPA is not required to re-prove the existence of the atom every time it approaches a scientific question.")

In addition, EPA disagrees that SCC overstates the benefits of mitigation. The SCC estimates do not include all significant climate changes damages and are therefore likely underestimates. In addition, the SCC estimate is for CO_2 only, as noted in the previous comment response. As a result, EPA has supplemented the quantified benefit estimates with a qualitative discussion about benefits.

Furthermore, EPA disagrees with the commenter's conclusions about the potential for emission leakage—in this case, the potential for the rule to "increase greenhouse gas emissions outside of the United States, through mechanisms such as a lower world price of oil due to restricted American demand"—and that SCC is therefore irrelevant. First, EPA disagrees that the rule would necessarily result in emission leakage. The analysis conducted for this rule estimates that the world price of oil will fall modestly in response to lower U.S. demand for refined fuel (see preamble section III.H.8.c for discussion). One potential result of this decline in the world price of oil would be an increase in the consumption of petroleum products, particularly outside the U.S. In addition, other fuels could be displaced from the increased use of oil worldwide. For example, if a decline in the world oil price causes an increase in oil use in China, India, or another country's industrial sector, this increase in oil consumption may displace natural gas usage. Alternatively, the increased oil use could result in a decrease in coal used to produce electricity. An increase in the consumption of petroleum products particularly outside the U.S., could lead to a modest increase in emissions of greenhouse gases, as well as criteria air pollutants, and airborne toxics from their refining and use. However, lower usage of, for example, displaced coal would result in a decrease in greenhouse gas emissions. Therefore, any assessment of the impacts on GHG emissions from a potential increase in world oil demand would need to take into account market impacts in all segments of the global energy sector. Given the complexity of analyzing these multiple market impacts globally, the agencies' analyses have not attempted to estimate these effects.

Second, even if emissions leakage were relevant to this rulemaking, it would affect the estimate of total emissions, not the estimate of the value of damages per ton. In other words, emission leakage is not relevant to the value of a one ton reduction in CO_2 emissions (i.e., SCC). As discussed in the preamble we have assumed that this rule would result in small (marginal) impacts on cumulative global emissions. Even in the unlikely event that emissions leakage occurred under this rulemaking, it would be unlikely to alter the cumulative global emissions trajectory underlying the SCC estimates.

18.4.2. Estimated Non-GHG Health and Environmental Impacts

Organizations Included in this Section

American Lung Association
Boyden Gray & Associates PLLC
Environmental Defense Fund (EDF)
Growth Energy
Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)
Mass Comment Campaign (375) (Union of Concerned Scientists-2)

Mass Comment Campaign (9,570) (Unknown Organization)
Pennsylvania Department of Environmental Protection
Union of Concerned Scientists (UCS)

Organization: American Lung Association

The benefits anticipated from the proposed standards are significant. The preferred alternative directly reduces emissions of carbon dioxide, but should also result in reduced emissions of sulfur dioxide, $PM_{2.5}$, volatile organic compounds (VOCs), nitrogen oxides, benzene, and diesel particulates. [EPA-HQ-OAR-2010-0799-9902-A2, p. 1]

Many of the emissions reduced because of the proposed rule directly impact the health, particularly the lung health, of millions of Americans. The American Lung Association's 2011 State of the Air report found that half the nation - over 154 million Americans - continues to live in areas with dangerous levels of ozone or particulate matter. Current studies warn of significant and complex impacts on particulate matter and tropospheric ozone from climate change. Areas already suffering from poor air quality will find it much harder to clean up ozone and particulate matter, as well as other emissions because of the added burden from the changes to climate. The proposed rule helps to mitigate the short and long-term health impacts of these pollutants as well as the targeted issue of climate change. [EPA-HQ-OAR-2010-0799-9902-A2, p. 1]

Response:

EPA agrees that the benefits of the standards are significant and clearly outweigh the costs. In the RIA that accompanies the final rulemaking (Chapters 6 and 7), we discuss the breadth of benefits associated with both reductions in GHG emissions and non-GHG emissions associated with the standards, including (and especially) reductions in risk to human health and welfare.

Organization: Boyden Gray & Associates PLLC

Supporting action to address these toxic compounds in gasoline in this rulemaking through use of alternative fuels is EPA's own acknowledgement that increased fuel efficiency results in what is known as the "rebound effect"—that is, an actual increase in driving that results from its lowered cost due to greater efficiency. The increased driving in turn means increased tailpipe emissions.30 EPA indicates that overall there is a decrease on these criteria pollutants because of offsetting decreases in upstream emissions. But there are at least two gaps in EPA's reasoning. [EPA-HQ-OAR-2010-0799-9506-A1, p. 9]

First, it is not at all clear that the upstream reductions can offset increases in tailpipe emissions on a population-weighted basis, since tailpipe emissions occur on roadways, where the exposure is greatest, as EPA acknowledges in this rulemaking.31 The goal of EPA regulations under the CAA should be a reduction of human exposure to toxics, not simply the reduction of emissions in general. In fact, motor vehicle tailpipe emissions are the largest single source of air pollution affecting urban populations, and this exposure will not be significantly affected by upstream reductions.32 At the very least, EPA needs to address this point. [EPA-HQ-OAR-2010-0799-9506-A1, p. 9]

Second, and perhaps more important, it is not clear how EPA is calculating the benefits in Chapter 6 of the DRIA. EPA provides charts and citations (i.e., Fann et al., 2007) that calculate the public health benefits per ton of reduction of “direct” PM at $300,000 per ton. At the same time, EPA states that the heavy molecular weight components of gasoline create what EPA classifies as “direct” PM emissions.33 These direct PM emissions are among those that will increase at the tailpipe under the proposal due to the rebound effect, but it is unlikely that this increase will be offset by upstream decreases, because these direct emissions are not associated with upstream operations. And it is not clear that secondary aerosols are associated with upstream operations, either. [EPA-HQ-OAR-2010-0799-9506-A1, p. 9]

In all of issues noted herein, EPA’s proposal raises not merely questions of law but also fundamental questions of regulatory costs and benefits. By undermining NHTSA’s incentives for CNG and alternative fuels, EPA will increase pollution. By requiring auto companies to reduce carbon output, EPA will exacerbate non-GHG pollution, both through the “rebound effect” and through the promotion of advanced engine technologies (such as direct injection) that increase pollution when not paired with cleaner, higher-octane fuel. As EPA itself noted in the DRIA (at p. 6-32), an accurate and thorough consideration of all costs and benefits is critically important to ensure that the agencies’ new standards will promote public health, not harm it. Accordingly, EPA and NHTSA must revisit their cost-benefit analyses, to account for each of those adverse effects of EPA's standards. [EPA-HQ-OAR-2010-0799-9506-A1, p. 11]

Organization: Growth Energy

The oversight with regard to potential PM increases due to widespread DGI use is important because PM effects are a substantial consideration in the cost-benefit analysis. In summarizing the benefits analysis, the proposal emphasizes PM benefits noting:

The benefits include all benefits considered by EPA such as GHG reductions, PM benefits, energy security and other externalities such as reduced refueling time and accidents, congestion and noise. [EPA-HQ-OAR-2010-0799-9505-A1, p. 39]

Organization: Union of Concerned Scientists (UCS)

In our original comments to the NOI, UCS urged the agencies to set standards based on the full set of societal benefits, not just fuel savings. Specifically, we stated “monetization of the full set of societal benefits should be assessed, including (but not limited to) improved energy security through reduced oil consumption, lower carbon emissions, and enhanced economic security in the face of likely gasoline price spikes.”19 [EPA-HQ-OAR-2010-0799-9567-A2, p. 5]

Response:

We refer the commenters to Preamble Section III.G.1 and RIA Chapter 4 for a complete discussion of the emissions impacts associated with this rulemaking and the methods used to estimate them. As the commenters note, we estimate that there will be slight emissions increases associated with rebound driving as well as emission reductions associated with upstream sources such as power plants, refineries, and related emission reductions due to reductions in upstream distribution and transport of fuels (associated with the rule's fuel savings impacts).

The emission impacts associated with the standards serve as inputs to the non-GHG photochemical air quality modeling analysis and the associated health impacts analysis. As shown in RIA Chapter 6, our air quality modeling results indicate that there are very small non-GHG impacts over the majority of the country. For PM, the results indicate that in 2030, a population weighted average reduction of approximately 0.01 ug/m3 can be expected (see RIA Chapter 6.3.1). For ozone, we estimate that in 2030, on a population-weighted basis, there is virtually no change in ambient concentrations in ozone. For the commenter's reference, we further discuss the impact of the rebound effect and advance engine technologies on emissions in Section 17 of this response to comments document.

In terms of health impacts, however, it is clear that upstream reductions in emissions related to ambient concentrations of both direct and indirect PM outweigh the slight emission increases associated with rebound driving. In terms of PM-related health impacts, we estimate that in 2030, emission reductions associated with the rule will result in between 110 to 280 fewer premature mortalities across the U.S. Compared to the estimate of 1 to 3 additional ozone-related premature mortalities associated with rebound-related emission increases, it is clear that upstream emission reductions outweigh the slight downstream emission increases and in fact improve health on a national basis. We note that EPA conducted full-scale photochemical air quality modeling to capture the impacts both upstream and downstream emissions have on ambient ozone formation direct and indirectly formed ambient $PM_{2.5}$ formation. We also note that all fine particles, regardless of their chemical composition, are equally potent in causing health impacts. EPA has also concluded that the scientific evidence is not yet sufficient to allow differentiation of effect estimates by particle type (See EPA's Integrated Science Assessment for Particulate Matter - http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=216546#Download). Please refer to RIA Chapter 6 for a full discussion of the non-GHG health benefits associated with the rule.

Finally, in response to the comment made by the Union of Concerned Scientists, we note that on a nationally aggregated basis, our analysis shows that the standards do not increase pollution but in fact significantly reduces GHG emissions and improves ambient concentrations of PM. Our analysis in the final rulemaking (of all benefits categories such as GHG reductions, non-GHG benefits, fuel savings, energy security and other externalities such as reduced refueling time and accidents, congestion and noise) is an accurate and thorough consideration of all costs and benefits, and demonstrates that the new standards will promote public health, not harm it.

Organization: Environmental Defense Fund (EDF)

I. EPA'S MONETIZED HEALTH BENEFITS OF AIR QUALITY IMPROVEMENTS ARE UNDERESTIMATED

As explained in the proposal and EPA's Draft Regulatory Impact Analysis (DRIA), EPA calculates the premature-mortality-related effect coefficients that underlie the benefits per- ton estimates of reductions in criteria pollutants from only the American Cancer Society cohort (Pope et al. 2002). The Agency does not present the benefits-per-ton estimates using the Harvard Six Cities cohort (Laden et al. 2006), even though EPA states, "If the benefit-per-ton estimates were based on the Six-Cities study (Laden et al., 2006), the values would be approximately 245% (nearly two-and-a-half times) larger." (Proposal Preamble, page 75131; DRIA, Page 6-33) In fact, EPA admits that, "…using the benefit per-ton value derived from the ACS study (Pope et al., 2002) alone provides an incomplete characterization of $PM_{2.5}$ benefits." [EPA-HQ-OAR-2010-0799-9519-A1, p. 15]

In NHTSA's DEIS, the Agency provides the benefits-per-ton estimates from both studies side-by-side. In fact, NHTSA states the reason it does so is because of a recommendation by EPA. "EPA calculated the premature-mortality-related effect coefficients that underlie the benefits-per-ton estimates from epidemiology studies that examined two large population cohorts – the American Cancer Society cohort (Pope et al. 2002) and the Harvard Six Cities cohort (Laden et al. 2006)…According to EPA, both studies should be used to generate benefits estimates." (DEIS, Page 4-24) [EPA-HQ-OAR-2010-0799-9519-A1, pp. 15-16]

EDF requests that EPA present the results based on both the Pope et. al. and the Laden studies to ensure that a more transparent and comprehensive estimate of the monetized health benefits of air quality improvements are developed. [EPA-HQ-OAR-2010-0799-9519-A1, p. 16]

Organization: Growth Energy

The proposed rule also acknowledges that the agencies' analysis includes no estimates of the direct health or other benefits associated with reductions in emissions of criteria pollutants other than PM. Therefore, two of the major drivers in the list of cost-benefit categories above, "other air pollutants" and "increased driving due to the rebound effect" are determined by PM emissions. The reason that PM dominates the EPA non- GHG analysis is that the damage cost in Table II-8 is much greater for PM than for other criteria pollutants. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 39-40]

Response:

For the FRM, we are conducting full-scale air quality modeling to assess the rule's impact on ambient concentrations of ozone and PM in 2030 and the associated quantified/monetized health impacts. The analysis includes a co-equal presentation of PM-related premature mortality based on Pope and Laden (Tables III-85, III-87, and III-89 of Preamble III, and corresponding tables in Chapter 6 of the RIA) along with a full accounting of the morbidity impacts associated with PM and ozone. Time and resource constraints preclude the agency from running air quality modeling for the Model Year analysis. We therefore continue to use a dollar-per-ton method (consistent with the 2012-2016 LD GHG approach) to monetize the PM-related benefits associated with the standards over the lifetime of each 2017-2025 Model Year vehicle. Because the difference between the Pope- and Laden-based estimates are so slight, relative to the other cost and benefits monetized in the analysis (they represent between ~1-3% of total benefits, depending on the study and discount rate), we chose to simplify the presentation of PM-related benefits in the cost-benefit summary tables by presenting only the Pope-based value, while qualitatively describing that the Laden-based estimate would increase PM-related benefits by ~2.5 times. Even though the Pope-based value is the more conservative end of the range of PM-related benefits, the inclusion of Laden would not provide the reader with a meaningful difference when assessing the comparison of total costs and benefits of the rulemaking.

We have, however, revised our text in Preamble Section III.H.7 (Table III-90) and in FRM TSD 4 - Joint Economic Assumptions (Table 4-13) to present, for reference purposes, the range of Pope- and Laden-based dollar-per-ton values. We have also edited the text to more clearly state that the presentation of the low end of the range of PM-related benefits is in no way meant to convey a preference for one study over the other (see Preamble III.H.7.b and RIA Chapter 6.3.2).

We continue to acknowledge that there are several health impact categories that EPA was unable to quantify in the Model Year analysis due to limitations associated with using dollar-per-ton estimates. Because NOx and VOC emissions are also precursors to ozone, changes in NOX and VOC would also impact ozone formation and the health effects associated with ozone exposure. Dollar-per-ton estimates for ozone, however, do not exist due to issues associated with the complexity of the atmospheric air chemistry and nonlinearities associated with ozone formation. However, given the magnitude of the ozone impacts modeled in the Calendar Year analysis, it is reasonable to assume that the ozone-related impacts would be minimal and would not make a difference when assessing the comparison of total costs and benefits of the rulemaking.

Organization: Mass Comment Campaign (20,500) (Union of Concerned Scientists-3)

The proposal largely ignores the pollution released from power plants when electric cars are recharged. The Environmental Protection Agency should require automakers to fully account for their vehicles' pollution--whether from petroleum or power plants. [EPA-HQ-OAR-2010-0799-10166-A2_MASS, p.1]

Organization: Mass Comment Campaign (375) (Union of Concerned Scientists-2)

The proposal largely ignores the pollution released from power plants when electric cars are recharged. The Environmental Protection Agency should require automakers to fully account for their vehicles' pollution--whether from petroleum or power plants. [EPA-HQ-OAR-2010-0799-1246-A1_MASS, p.1]

Organization: Mass Comment Campaign (9,570) (Unknown Organization)

The proposal largely ignores the pollution released from power plants when electric cars are recharged. The Environmental Protection Agency should require automakers to fully account for their vehicles' pollution--whether from petroleum or power plants. [EPA-HQ-OAR-2010-0799-9578-A1_MASS, p.1]

Response:

EPA estimates the full range of pollution impacts from the standards, including emissions at the tailpipe and emissions from "upstream" sources such as power plants, refineries, and fuel transportation and distribution. Please refer to Preamble Section III.G.1 and RIA Chapter 4 for a complete description of the emissions impacts of the rulemaking and the estimation methodology. Included in our analysis are power plant emissions related to increased penetration of electric vehicles in the future light duty vehicle fleet. These emissions were included in the air quality modeling conducted for this analysis, the output of which were used in the health impacts analysis. Refer to Chapter 6 of the RIA for a description of both the air quality modeling and health impact analyses. Taken together, the non-GHG emission changes yield a net reduction in human health risk and contribute to the overall benefits of the standards.

Organization: Pennsylvania Department of Environmental Protection

Air Quality Effects. In addition to examining the air quality effects of the factors above [see section 18.2 of this comment summary], the increase in volatile organic compounds (VOC) emissions needs to be estimated due to the possible increase in Reid vapor pressure in gasoline from the increased use of higher octane gasoline. Higher emissions of VOC can lead to increased ground-level ozone concentrations. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Response:

Regarding comments from the Pennsylvania Department of Environmental Protection, we do not agree that higher octane fuel will be necessary. As explained in section 3.3.1.8 of the joint TSD, higher octane fuel is not necessary for high compression turbocharged and downsized engines to prevent the onset of combustion knock. EPA therefore assumed no change in the octane of certification or in-use gasoline within its analysis and the effectiveness values used for the high BMEP engines reflect that fact.

In partial confirmation, the current Ford EcoBoost turbocharged GDI engines do not require the use of premium fuel, although those engines are not operating at BMEP levels as high as those expected under our rule. Importantly, a combination of both intake charge dilution (e.g., cooled EGR) and in-cylinder evaporative fuel cooling (e.g., direct injection) are expected to allow higher BMEP GDI engines to operate on regular grade gasoline. All packages at 27 bar BMEP analyzed by EPA included cooled EGR to allow higher BMEP operation and prevent the onset of combustion knock on current certification or in-use fuels.

EPA estimates the full range of pollution impacts from the standards, including emissions at the tailpipe and emissions from "upstream" sources such as power plants, refineries, and fuel transportation and distribution. Please refer to Preamble Section III.G.1 and RIA Chapter 4 for a complete description of the emissions impacts of the rulemaking and the estimation methodology. This includes both upstream and tailpipe VOC emissions associated with the final standards. We use these non-GHG inventories to estimate the changes in ambient concentrations of PM, ozone, and selected air toxics. Please refer to Chapter 6 of the RIA for a description of both the air quality modeling and health impact analyses. Taken together, the non-GHG emission changes yield a net reduction in human health risk and contribute to the overall benefits of the standards.

18.5. Energy Security Impacts

Organizations Included in this Section

American Council for an Energy-Efficient Economy (ACEEE)
America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)
American Petroleum Institute (API)
American Public Gas Association (APGA)
Applied Materials
BlueGreen Alliance
Center for Biological Diversity (CBD)
Consumer Federation of America (CFA)
Defour Group LLC
Detroit NAACP
Ecology Center
Environmental Defense Fund (EDF)
International Council on Clean Transportation (ICCT)
Kobus, D.
Marks, R.
Michigan House of Representatives, 49th District
Michigan State Senate, District 18
National Wildlife Federation (NWF)
Pew Charitable Trusts
Renewable Energy Long Island
Securing America's Future Energy (SAFE)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Smith, G.
Tesla Motors, Inc.
Union of Concerned Scientists (UCS)
Thirty Senators from the United States Senate
Lieutenant General Rick Zilmer (Retired)

Organization: American Council for an Energy-Efficient Economy (ACEEE)

At the same time, this kind of savings will put a downward pressure on the price of all petroleum products. If that holds, then fuel economy standards might generate, we estimate, an additional $25 billion in price-related fuel savings. That means even if you're not driving a new car, but if you're heating your home with fuel oil, or if you're using petroleum as a chemical feed stock, or if you're flying from San Francisco to Washington, D.C., you're benefiting from a lower price of oil or gasoline, and that benefits everyone.

The agencies also decline to count the monopsony benefit of the rule, under which reduced U.S. demand leads to lower oil prices globally. This is a departure from previous rules, and is justified by the argument that the monopsony benefit is of a “redistributive nature” when viewed from a global perspective (NPRM p.74932). However, even if all petroleum were produced domestically, reduction in the price of petroleum would bring a net economic benefit in terms of job creation, for example, as explained previously, due to the low labor intensity of the energy sector. Thus it is a mistake to exclude these effects from the analysis of the economic benefits of the rule. The agencies also do not take into account the price reduction following from the fact that reduced demand will generally mean that the most expensive sources of petroleum are not used, which also reduces the price of all petroleum. [EPA-HQ-OAR-2010-0799-9528-A2, pp. 1-2]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 111-112.]

Organization: America's Natural Gas Alliance (ANGA) and American Gas Association (AGA)

C. The Agencies’ Analysis of the Benefits of this Rule Should Include More Complete Energy Security Costs

Energy Security Costs [EPA-HQ-OAR-2010-0799-9548-A1, p. 5]

In response to the agencies’ request for comment on whether to include costs of the relevant U.S. overseas military presence in the energy security benefits analysis (76 FR 75136), AGA and ANGA strongly support doing so. To include only “the macroeconomic disruption and adjustment costs portion of the energy security benefits to estimate the monetary value of the total energy security benefits of this program” (*id.* at 74932) ignores enormous costs that are directly attributable to U.S. dependence on overseas oil supplies. A single example should suffice: the express purpose of the Navy’s Fifth Fleet – reestablished in 1995 and based in Bahrain – is to secure the Persian Gulf sea-lanes, and the annual cost of maintaining this force is in the billions of dollars. [EPA-HQ-OAR-2010-0799-9548-A1, pp. 5-6]

Organization: American Petroleum Institute (API)

Comments on Petroleum Consumption and Import Externalities

The issue of petroleum consumption and import externalities is discussed on page 74898 of the Preamble, consisting of a one-paragraph summary of the issue. The Preamble notes the following externalities are not reflected in the market price for crude: (1) higher price for petroleum products from the effect of U.S. demand on world oil prices; (2) the risk of disruptions caused by sudden reductions in the supply of imported crude; and (3) the expenses of maintaining a military presence to secure imported oil supplies and for maintaining the strategic petroleum reserve. This summary paragraph goes on to say that higher volumes of imported crude and refined products increases the magnitude of these external economic costs (increasing the true economic costs of transportation fuels above the resource costs of producing them), and that reducing volumes of imports or reducing fuel consumption can reduce these external costs. [EPA-HQ-OAR-2010-0799-9469-A1, p. 11]

In the Preliminary Regulatory Impact Analysis (PRIA) developed for this rulemaking, NHTSA stated the following with respect to issue of military expenses associated with protection of supply (page 643): [EPA-HQ-OAR-2010-0799-9469-A1, p. 11]

NHTSA currently believes that while costs for U.S. military security may vary over time in response to long-term changes in the actual level of oil imports into the U.S., these costs are unlikely to decline in response to any reduction in U.S. oil imports resulting from raising future CAFE standards for light-duty vehicles. U.S. military activities in regions that represent vital sources of oil imports also serve a broader range of security and foreign policy objectives than simply protecting oil supplies, and as a consequence are unlikely to vary significantly in response to changes in the level of oil imports prompted by higher standards. [EPA-HQ-OAR-2010-0799-9469-A1, pp. 11-12]

Neither the Congress nor the Executive Branch has ever attempted to calibrate U.S. military expenditures, force levels, or deployments to any oil market variable, or to some calculation of the projected economic consequences of hostilities in the Persian Gulf. Instead, changes in U.S. force levels, deployments, and thus military spending in that region have been largely governed by political events, emerging threats, and other military and political considerations, rather than by shifts in U.S. oil consumption or imports. NHTSA thus concludes that the levels of U.S. military activity and expenditures are likely to remain unaffected by even relatively large changes in light duty vehicle fuel consumption. As a consequence, the agency's analysis of alternative CAFE standards for MYs 2017-2025 does not include savings in budgetary outlays to support U.S. military activities among the benefits of higher fuel economy and the resulting fuel savings. [EPA-HQ-OAR-2010-0799-9469-A1, p. 12]

The above PRIA statements are important points with respect to military expenditures and the protection of crude supply. They are very consistent with the points made by EPA during the RFS2 rulemaking that were included in the "Renewable Fuel Standard Program (RFS2) Summary and Analysis of Comments" document (page 7-248).25 Further, a 2010 report prepared by the National Research Council also considered the issue of military protection of crude supply and found the following: [EPA-HQ-OAR-2010-0799-9469-A1, p. 12]

Dependence on imported oil has well-recognized implications for foreign policy, and although we find that some of the effects can be viewed as external costs, it is currently impossible to quantify them. For example, the role of the military in safeguarding foreign supplies of oil is often identified as a relevant factor. However, the energy-related reasons for a military presence in certain areas of the world cannot readily be disentangled from the non energy-related reasons. Moreover, much of the military cost is likely to be fixed in nature. For example, even a 20 per cent reduction in oil consumption, we believe, would probably have little impact on the strategic positioning of U.S. military forces throughout the world. [EPA-HQ-OAR-2010-0799-9469-A1, p. 12]

Although NHTSA conducted a sensitivity analysis of the impact of some reduction in military spending as a result of this rule, it was not included in the baseline assessment for the very good reasons spelled out above. The Preamble should note the highly speculative nature of this kind of assessment and provide the reader with the appropriate caveats that were included by NHTSA in the PRIA. [EPA-HQ-OAR-2010-0799-9469-A1, p. 12]

Organization: American Public Gas Association (APGA)

APGA has long recognized that the United States' dependence on foreign oil is one of the foremost threats to our nation both economically and militarily. The U.S. economy is dangerously dependent upon crude oil for stability and economic growth and in no area is this dependence more evident than in the transportation sector. Even slight increases in the price of gasoline can send shock waves throughout the economy, reduce consumers' purchasing power and spending, cause financial markets to tumble, and inhibit economic growth. [EPA-HQ-OAR-2010-0799-9448-A1, p-.1]

Moreover, it is on the foundation of our economic strength that our military might depends. The sad fact remains that the main sources of crude oil are outside the U.S. According to the Energy Information Administration, the U.S. imports approximately 51 per cent of the oil it consumes (2009 data), meaning that America's economic prosperity (and therefore its military strength) is tied to purchasing crude oil from foreign countries, many of which have interests that are antithetical to our own. In short, the U.S. sends billions of dollars to potentially hostile nations, upon which it is dependent for its prosperity and ultimately its security. [EPA-HQ-OAR-2010-0799-9448-A1, p. 1

Organization: Applied Materials

And we think that it's very important from a security standpoint, as several speakers have stated, as well.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 201.]

Organization: BlueGreen Alliance

Every day our country sends an estimated $1 billion to foreign countries for oil. Strong standards will keep more of the dollars here in the United States and move America to a more efficient advanced vehicle fleet creating hundreds of thousands of jobs, economic opportunities both inside and outside the auto industry.

In 2008 we saw the consequences when automakers had difficulty responding to consumer shifts in response to volatile fuel prices. So these strong feasibility standards will provide long-term certainty to the industry and ensure that innovation continues and recent investments in advanced technology pay off. They will also set the stage for weaning America off oil dependence for good and for the long-term reductions in greenhouse gas pollution we need to create a sustainable clean energy economy.

In addition to the direct savings for those purchasing new cars and light trucks, the proposed standard will also put downward pressure on gasoline prices by reducing demand. Simple demand-supply logic suggests that the standard will put downward pressure on the transportation fuel prices by putting downward pressure on the demand for transportation fuels. All drivers will benefit through lower gas prices than would be expected otherwise.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 38-39.]

Organization: Center for Biological Diversity

Similarly, the Agencies exclude the costs of maintaining a U.S. military presence to secure imported oil supplies from unstable regions "because their attribution to particular missions or activities is difficult." "Difficulty" does not justify conducting a cost-benefit analysis that improperly puts a thumb on one side of the scale. [EPA-HQ-OAR-2010-0799-9479-A1, p. 7]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 59.]

Organization: Consumer Federation of America (CFA)

Given the burden on household budgets and the continuing problem of oil vulnerability, it is not surprising to find that in our surveys, over a dozen in the past six or seven years, we find that three-quarters or more of respondents are concerned about gasoline prices and dependence on Mideast oil. They get the fact oil imports are a political problem.

They think it is important to reduce oil consumption and they support higher fuel economy standards as a way to do so. Almost two-thirds of the respondents' records supported 60-miles-per-gallon standards with a payback of three to five years, and this proposed standard meets and exceeds that. They also think a higher standard will be good for automakers.

There are several flaws in quantitative analysis that cause the agencies to seriously underestimate the value of higher fuel economy standards. We have pointed out these flaws in past analyses. [EPA-HQ-OAR-2010-0799-9419-A1, pp. 12-13]

- Oil has a strategic and security value that must be reflected in the analysis. [EPA-HQ-OAR-2010-0799-9419-A1, p. 14]

Indirect national security and economic benefits will be just over $40 billion (about 7 percent of the total) and include progress on major national public policy goals, such as reducing oil consumption and imports by almost 4 billion barrels and cutting the balance of payments deficit by $370 billion, which will produce a major boost to domestic economic growth by driving down the price of oil by $0.25 per gallon, lowering vulnerability to oil price shocks, and reducing the need for national security expenditures. [EPA-HQ-OAR-2010-0799-9419-A1, p. 5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 40-41.]

Organization: Defour Group LLC

Most studies show that increases in fuel economy standards will not enhance energy security and that the impacts on catastrophic global warming are negligible. To quote Michael Boskin, head of the first President Bush's Council of Economic Advisers, concluded in testimony before the National Academy of Sciences in 1991:

In my view, the presumption that U.S. energy security is directly tied to our level of gasoline consumption does not withstand close scrutiny. Given the increasing integration of world economies and the total integration of the world oil market, our energy security cannot be defined independently of our trading partners. Moreover, when one considers our own situation or, more properly, that of the world economy as a whole, even the most optimistic assessment of the oil consumption effects of higher CAFE standards cannot conceivably push us past the threshold where we would no longer have a vital security interest in the major oil-exporting regions of the world.[17] [EPA-HQ-OAR-2010-0799-9319-A1, p.11]

Or in the words of Resources for the Future economists, Douglass Bohi and Michael Toman, in their seminal 1996 study:

There is so much uncertainty about the costs used to calculate [energy security] premiums that it is impossible to make a credible judgment about the correct magnitude of the premium that should be attached to oil imports, oil consumption, or strategic oil storage. This very uncertainty should engender great caution about any efforts to apply energy security premiums in energy policy analysis. In particular, the energy security argument is a weak basis for supporting oil import controls, conservation of oil consumption, or larger strategic oil stocks. Because of the uncertainties, only win-win policies that offer prospects for benefits under a variety of circumstances can be recommended unambiguously. Such policies include support for energy research and development to improve energy efficiency and to diversity energy supplies.[18] [EPA-HQ-OAR-2010-0799-9319-A1, p.11]

---

17 - Michael Boskin, Testimony on Fuel Economy Standards Before National Academy of Sciences, July 10, 1991.

18 - Douglass R. Bohi and Michael A. Toman, The Economics of Energy Security, 1996, Resources for the Future, page 71 (Emphasis Added).

Organization: Detroit NAACP

These standards mean reducing our dependence on foreign oil and it also, as was said earlier, will strengthen national security. In 2010 the United States imported more than 4.3 billion barrels of oil sending billions and billions of dollars to other nations where our economy suffered immensely and struggled.

These proposed standards will reduce oil consumption, greenhouse gas emissions, and air pollution. They will reduce dependence on oil by 4 billion barrels which is very, very significant, and it will slash 2 billion metric tons on greenhouse gas emissions.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 140.]

Organization: Ecology Center

We are especially supportive of the fact that the proposed rules will not only lead to significant reductions in petroleum use and greenhouse gas emissions.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 189.]

Organization: Environmental Defense Fund (EDF)

With respect to the energy security, when combined with Phase 1 clean car standards, the proposed rule's fuel economy and emissions standards will cut our oil consumption by over 2 million barrels a day, more than we import from the Persian Gulf.

Our nation’s dependence on oil is a threat to national security. The U.S. consumes nearly 25 percent of the world’s oil production, but controls less than 2 percent of the supply. And over half of the oil we use each day is imported from foreign countries, many of which do not like us. In 2008, we sent over $1 billion a day overseas to pay for oil, the majority of it going to nations deemed “dangerous or unstable.” The rate at which we consume oil helps our enemies by paying to finance and sustain their unfriendly regimes. And the longer the U.S. remains dependent on petroleum, the more the U.S. will have to engage in tough fights just to protect our energy supplies. [EPA-HQ-OAR-2010-0799-9519-A1, p. 2]

Additionally, the high price of oil threatens our fragile economy. Gasoline and diesel fuel prices remain high, leaving consumers with less money to spend elsewhere. More than 70 percent of the oil we consume is for transportation, and more than 60 percent of that is used to fuel passenger cars and light trucks. If we want to reduce our dependence on oil, we must address fuel consumption from our fleet of highway cars and trucks. [EPA-HQ-OAR-2010-0799-9519-A1, p. 2]

One piece of the economic picture that is often not considered is the economic impact of unexpected spikes in oil prices, price volatility. One of EDF’s economists, Jamie Fine, has worked with collaborators to show that policies that lower energy demand also provide a hedge against rising energy prices. Their study – which will soon be published in the Journal, Energy Policy – looked at the energy use that will be avoided and the resulting savings by California’s entire plan to reduce GHGs to 1990 levels by 2020, of which the current GHG standards are a critical part. They found that cost savings from avoided gasoline and diesel use in the event of an energy price shock in 2020 could be in the range of $2.4 to $5.2 billion for the state of California alone.11 [EPA-HQ-OAR-2010-0799-9519-A1, p. 2-3]

Agencies should include additional Energy Security Benefit

Oil dependence has serious consequences. The US consumes nearly 19 million barrels of oil a day, which is nearly a quarter of the oil consumed in the entire world, and more than all EU nations combined. Over half of the oil we use each day is imported from foreign countries and more than 70 percent of the oil we consume is used for transportation. Our addiction to oil threatens our national security and puts our service men and women at risk. [EPA-HQ-OAR-2010-0799-9519-A1, p. 13]

Our petroleum addiction also has significant environmental consequences. Extracting oil fouls land and water, kills wildlife, and destroys habitat. Refining oil creates air pollution and water pollution. Combustion of oil—burning oil and oil-based fuels in engines—releases CO_2, which causes global warming (about 42 percent of the world's energy-related CO_2 emissions come from oil). Emissions from oil refining and combustion also contribute to ozone, which worsens asthma, causes premature death and contributes to other health problems.32 [EPA-HQ-OAR-2010-0799-9519-A1, p. 13]

In addition, oil dependence makes the U.S. economy vulnerable to short-and long-term increases in energy costs. In terms of imported oil, an increase in the price of imported oil could lead to ‘imported inflation’ and vulnerability of the local manufacturers and consumers alike. [EPA-HQ-OAR-2010-0799-9519-A1, p. 13]

We commend the Administration for recognizing the importance of U.S. energy security and the positive impact more efficient use of transportation rules would have. However, we believe the Agencies have consistently undervalued the benefits of past fuel economy and GHG rules, and this proposed rule, on U.S. energy security. Therefore, we recommend that the final rule include the following additional inputs. [EPA-HQ-OAR-2010-0799-9519-A1, pp. 13-14]

In determining the full benefits of fuel consumption reduction and energy security, the Agencies did not attempt to quantify the reduction in U.S. military spending associated with the reduction in U.S. oil imports. The Agencies state in the proposal that “attributing military spending to particular missions or activities is difficult.” (Proposal preamble, page 75136) While we agree that such a quantitative analysis would result in uncertainties, that is not a reason to assign the benefits a zero value. It is important the Agencies develop a methodology to value the benefits of reduced oil imports on U.S. military spending for this rule, and future rules that reduce our dependence on foreign oil. We request that the Agencies at least report a range of estimates for these benefits. [EPA-HQ-OAR-2010-0799-9519-A1, p. 14]

We also recommend that the Agencies consider cost estimation proposals such as that included in Sen. Richard Lugar’s (R-Ind.) Practical Energy and Climate Plan, S. 3464. See Attachment A. This proposed legislation included both an extensive list of potential impacts of energy security to be considered and an alternative approximation valuation methodology for the “external cost of petroleum use” (i.e. this does not include the actual fuel savings). For inputs that the Agencies cannot quantify, the final rule should include a list and explain that the benefits of the rule are likely undervalued due to such factors. [EPA-HQ-OAR-2010-0799-9519-A1, p. 14]

[These comments were also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 287.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 173.]

Organization: International Council on Clean Transportation (ICCT)

There are other advantages to society from reducing the amount of fuel we consume. The benefits for energy security are the same as investing in new oil wells - reduced oil imports, improved balance of trade, and downward pressure on worldwide oil prices. [EPA-HQ-OAR-2010-0799-9512-A1, p. 13]

Organization: Kobus, D.

America's dependence on oil puts our environment, economy, and national security at risk. You recently took an important step toward addressing this problem when you proposed new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of a 54.5 mpg fleet-wide standard by 2025. [EPA-HQ-OAR-2010-0799-1370-A1, p. 2]

Organization: Marks, R.

I question the use of CAFE to reduce oil consumption. For the last 40 years, CAFE has had the opposite affect. People bought bigger cars and trucks and drove them more miles per year and consumed more gallons of gas per vehicle. 40 years ago, we were 25% dependent on foreign oil and today we are about 66% dependent. CAFE has not done what you claim, ever! The only reason gas consumption has dropped recently is that the price of gas has risen to between $3 and $4 per gallon. It has nothing to do with vehicle miles per gallon! Are you serious about our dependence on oil or not? If you are serious, then this Nation needs a National Energy Policy which will 1. Reduce our dependency on foreign oil, by using less, 2. Improve World climate concerns through reduction in fossil fuel consumption, 3. Develop alternative fuel solutions in both transportation and energy sectors, and 4. Keep America growing, moving forward and secure. CAFE does not do this. [EPA-HQ-OAR-2010-0799-1680-A1, p. 1]

CAFE is stupid and there are much better market driven ways to create National security. Read your history! CAFE does not work. [EPA-HQ-OAR-2010-0799-1680-A1, p. 1]

Organization: Representative from Michigan House of Representatives, 49th District

Greater fuel economy will also help reduce our dangerous addiction to foreign oil and keep the members of our armed services out of danger. The United States imported more than 4.3 billion barrels of oil in 2010. This dependency places increasing demands on American security forces to keep the peace in many of the most dangerous areas of the world. [EPA-HQ-OAR-2010-0799-7983-A1, p. 2]

Organization: State Senator from Michigan State Senate, District 18

Greater fuel economy benefits all of us in four ways: firstly, it benefits our environment by reducing greenhouse gas emissions; secondly, it secures our energy independence; thirdly, its saves us money at the pump; and finally, it creates high-quality U.S. jobs that strengthen the economy. [EPA-HQ-OAR-2010-0799-5594-A1, p. 1]

Increased fuel economy will first benefit the environment by reducing greenhouse gas emissions and air pollution that stem from oil consumption. The proposed fuel economy standards will reduce our dependence on oil by 4 billion barrels and slash 2 billion metric tons in greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-5594-A1, p. 1]

In turn, we will also be gaining energy independence. In 2010, the United States imported more than 4.3 billion barrels of oil, sending billions of dollars to other nations while our own economy struggled to recover from recession. This dependence on foreign oil has threatened our national security and our economic progress for far too long. [EPA-HQ-OAR-2010-0799-5594-A1, p. 1]

Organization: National Wildlife Federation (NWF)

Our reliance on oil is a fundamental threat to wildlife, as well as to people and the economy

Our members and millions of Americans like them want to see America’s outdoor heritage sustained for their children. All too often, our heavy dependence on oil stands in the way. [EPA-HQ-OAR-2010-0799-9887-A2, p. 2]

Carbon pollution is warming our climate locally and worldwide. These changes threaten people and global security right now, and they are the most profoundly threatening force against the future of wildlife. Rising temperatures, floods, fires, droughts and ecosystem alterations are creating direct habitat loss, increased invasive species and other threats for wildlife species – many may never adapt. [EPA-HQ-OAR-2010-0799-9887-A2, p. 2]

The 20 million barrels of oil America uses every day (mostly for transportation) account for 40% of the US carbon pollution that causes climate change.1 [EPA-HQ-OAR-2010-0799-9887-A2, p. 2]

Meanwhile, when drilling projects go wrong, whole ecosystems are threatened by disasters like the Deepwater Horizon spill in 2010. And smaller leaks and spills, like the recent Enbridge oil spill in Michigan, do grave harm right in our backyards: to residents, to wildlife like herons, muskrats, ducks, geese, and to decades of community efforts to restore rivers like the Kalamazoo. [EPA-HQ-OAR-2010-0799-9887-A2, p. 2]

These standards make real and significant steps to reduce these threats [EPA-HQ-OAR-2010-0799-9887-A2, p. 2]

The proposed 2017 through '25 standards will double the fuel economy for our cars, SUVs and pickups from today's levels to an average of 54.5 miles per gallon by 2025. These vehicles will save Americans 4 billion barrels of oil and 2 billion metric tons of carbon pollution.

Together these standards will cut our demand for oil by 3.4 million barrels per day; more than all the oil we get today from the Persian Gulf, Venezuela and Russia combined.

As we are ensuring that every car and truck uses less fuel, steady expansion of electric and advanced vehicle technology can lead us even further into mass markets, high performance vehicle fleet that uses little oil and produce nearly zero pollution.

[These comments were also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 28-30.]

Organization: Pew Charitable Trusts

We have also sought to inform the public and policymakers across the nation about the dangers of U.S. oil dependence to our nation’s economy, national security and to the lives of the U.S. servicemen and women who defend oil transit routes and chokepoints around the world. The RAND Corporation estimates that the U.S. military spends between $67 and $83 billion annually defending oil chokepoints around the world. [EPA-HQ-OAR-2010-0799-9496-A2, p. 1]

As you know, the public strongly supports reducing U.S. oil dependence through higher fuel economy. Our bipartisan poll commissioned in July 2011 found that 91 percent of Americans identify U.S. dependence on foreign oil as a threat to our national security, and significant bipartisan majorities in every region of the country believe that adopting stronger fuel economy standards is the best way to lessen that dependence. [EPA-HQ-OAR-2010-0799-9496-A2, p. 2]

[This comment was also submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2009-2010-1788, pp.190-20.]

Organization: Renewable Energy Long Island

America's deepening dependence on oil puts our economy, environment, and national security at risk. I am writing to applaud you for taking an important step to confront the dangers of this dependence by proposing new global warming pollution and vehicle efficiency standards that would ensure new cars and light trucks meet the equivalent of the 54.5-mpg fleetwide standard by 2025. [EPA-HQ-OAR-2010-0799-7933-A1, p. 1]

The projected annual benefits of such standards by 2030 are enormous:

- $45 billion in savings at the gas pump
- 23 billion gallons of gasoline saved
- 280 million metric tons of global warming pollution avoided [EPA-HQ-OAR-2010-0799-7933-A1, p. 1]

Organization: Securing America's Future Energy

More than 70 percent of the oil consumed in the United States is used to fuel our transportation sector. The more than 240 million cars and light-duty trucks on the road in the United States in 2010 accounted for approximately 40 percent of total oil demand and those vehicles were fueled almost entirely by oil or other liquid fuels. Throughout the entire transportation sector, 93 percent of delivered energy is derived from oil. Simply put, our economy is heavily dependent on oil, and there are no substitutes available at scale today. [EPA-HQ-OAR-2010-0799-9518-A1, p. 2]

We have made tremendous strides in reducing the petroleum intensity as traditionally measured. In terms of barrels of oil consumed per dollar of gross domestic product (GDP), we have reduced petroleum intensity by about 50 percent since the early 1970s, as shown in Figure 2. Yet, despite this progress we remain highly dependent on oil to fuel our economy. It remains our primary transportation fuel and demand remains highly inelastic, especially in the short-term. It also is important to appreciate that the price of oil is set in a dynamic global market and our reduced use of several million barrels a day over a period of 15 years as the result of improved fuel economy is just as likely to result in lower production of oil as resulting in a lower price. Stated differently, over time, reducing domestic demand for oil will not necessarily lead to lower prices but might instead lead to production levels that are adjusted downward by producers based on expectations that increased fuel economy will reduce aggregate demand; in fact, oil prices can easily rise even in periods of shrinking domestic demand. [Figure 2 can be found on p. 5 of Docket number EPA-HQ-OAR-2010-0799-9518-A1] [EPA-HQ-OAR-2010-0799-9518-A1, p. 4]

A different measure of petroleum intensity than the traditional measure of barrels per $1,000 of GDP, our degree of dependence on oil is approaching levels we reached in the late 1970s. While our economy is becoming more fuel efficient and oil demand is stable in recent years, we are spending a growing portion of our national income on oil, even with relatively stable demand, due to rising oil prices. Although fuel economy requirements last year were at their highest level ever, our overall expenditure on oil and oil related products of $900 billion was far above historic levels, as shown in Figure 3. This represents about 6 percent of GDP, nearly twice the levels in the 1990s (see Figure 2), though we consumed approximately the same volume of oil. [Figure 3 can be found on p. 6 of Docket number EPA-HQ-OAR-2010-0799-9518-A1] [EPA-HQ-OAR-2010-0799-9518-A1, pp. 4-5]

Stated most simply, a portion of the benefit of increased fuel economy is being lost to high oil prices. And in a world with rising demand for oil, in which demand is being met by oil that is increasingly complex and expensive to produce, we must recognize that while improving fuel economy is an important measure, it cannot fully address the challenge posed to our energy and national security by persistently high and volatile oil prices. [EPA-HQ-OAR-2010-0799-9518-A1, p. 5]

This oil dependence constrains our foreign policy and forces the United States military to accept the responsibility of securing the world's oil supply. A RAND Corporation study showed the ongoing expense of oil dependence to the U.S. military is between $67.5 billion and $83 billion annually, while the cost of the constraints imposed on our foreign policy by our oil dependence may be impossible to calculate. Oil dependence also imposes significant costs on the nation's economy. Sending about $1 billion abroad each day to pay for expensive oil drains our economic resources and strengthens oil-exporting countries that are often hostile to U.S. interests. In 2011 alone, American businesses and consumers spent nearly $900 billion on gasoline, diesel and other refined petroleum products. This is part of an upward trend that has hit the average household particularly hard as oil prices have risen in recent years. As shown in Figure 1, annual household expenditures on gasoline have risen from about $1,800 in 2000 (representing 4.4 percent of median household income) to $4,050 in 2011 (representing 8.2 percent of median household income). Separate from the out-of-pocket costs for oil incurred by consumers, Department of Energy researchers at Oak Ridge National Laboratory have estimated the economic cost of U.S. oil dependence to be more than $5 trillion since the early 1970s. [Figure 1 can be found on p. 3 of Docket number EPA-HQ-OAR-2010-0799-9518-A1] [EPA-HQ-OAR-2010-0799-9518-A1, pp. 2-3]

In recognition of the threat to our nation posed by reliance on a single fuel whose market is dominated by governments that often share neither our interests nor our values, the United States has made genuine progress toward advancing energy security since we first became aware of the problem in the early 1970s. Most importantly, fuel economy has improved by more than 110 percent, from 13.6 MPG in 1974 to 29.6 MPG in 2011 (although much of that progress was made between 1975 and 1986), helping reduce the petroleum intensity of the economy by nearly 50 percent over the same period. This means that we are both spending less on oil, and that we are less affected by oil price volatility than we would have been in the absence of improved fuel economy. [EPA-HQ-OAR-2010-0799-9518-A1, pp. 3-4]

These improvements in fuel economy certainly have enhanced our economic and national security. Although we have faced serious challenges as a nation over the past forty years as a result of our dependence on oil, there is no question that they would have been far more serious without the progress we have made thus far. [EPA-HQ-OAR-2010-0799-9518-A1, p. 4]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 149-150.]

There's no question that using less oil is better than using more oil, especially for the environment. And these standards are an important tool to help us achieve that goal. But from an energy-security perspective, this rule is really requiring simply to maintain our current level of security. It's often overlooked that our dependence on oil arises not from how much oil we use but from how much we spend on oil, the volatility of that total expenditure, and the effect of volatility on the economy.

The price of oil is set in a dynamic global market, and our reduced use of several million barrels per day over a period of 15 years is just as likely to result in lower production as it is to result in higher prices. As we all know, growing demand from the developing world is increasing upward pressure on oil prices.

And, in fact, just yesterday, the EIA posted on its website the early release of the 2012 Annual Energy Outlook, which is calling for oil prices to reach up to $146 per barrel in 2010 dollars by the end of the forecast period. In fact, if you look at the chart which I handed out and we'll stick in the record, what you can see here is, even if the energy intensity of the economy is improved over the past several decades, the actual percentage of our economy that we are spending, the percentage of GDP that we're spending on oil is actually increasing, which goes directly to the question of oil dependence.

The only way to address this price volatility, which is a threat of our nation, we believe, is to stop using oil.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

As we noted in our report to hear on the issues of the American Securities Project, much of our oil comes from countries at high risk of instability several of which work actively against U.S. interests. Recent developments with Iran are yet another reminder of this fact.

By 2030 we will be using 1.5 million barrels less oil every day due to these standards.

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 122-123.]

Organization: Smith, G.

'Reduce oil consumption by an estimated 2.2 million barrels a day by 2025 more than our daily 2010 oil imports from the entire Persian Gulf.' Here they fail to point out that by opening up and encouraging exploitation of our domestic oil and gas, we will not need to be reliant on any imports. [EPA-HQ-OAR-2010-0799-8438-A1, p. 1]

Organization: Tesla Motors, Inc.

Enacting a final rule that forces alternative technology is necessary to reduce dependence on the monopoly of oil in transportation fuel for national security, the economy and the environment; [EPA-HQ-OAR-2010-0799-9539-A2, p. 1]

Reducing our dependence on petroleum in the transportation sector is a national imperative. By shifting the transportation sector to electricity, the United States can significantly reduce GHGs. Displacing traditional internal combustion engines with EVs can assist significantly in meeting this goal. EVs such as the Tesla Roadster, the Model S, and Model X generate zero greenhouse gases. Thanks to the over 2,500 all electric Roadsters in 31 countries on the roads today, Tesla customers have accumulated nearly 20 million pure EV miles displacing the need to utilize nearly 50,000 barrels of oil. Even when taking into consideration the source of the electricity stored on the vehicles, the GHG profile of EVs is lower than their internal combustion engine counterparts. A study by the Natural Resources Defense Council (NRDC) and the Electric Power Research Institute (EPRI) demonstrated that on a well-to- wheels comparison, use of plug-in hybrid electric vehicles (PHEVs) would result in reductions of anywhere from 3.4 to 10.3 billion metric tons of GHGs from 2010 to 2050 depending on the penetration level of PHEVs. With EVs that utilize no gasoline whatsoever, this reduction should be even higher. With the impacts of climate change caused by excessive GHGs evident today, switching away from traditional ICE equipped vehicles is an environmental imperative. [EPA-HQ-OAR-2010-0799-9539-A2, p. 3]

In addition to the environmental benefits, there are other compelling justifications for moving away from oil dependent modes of transportation. The United States currently accounts for 25% of world oil consumption. According to the Department of Energy, the U.S. transportation system remains dependent on petroleum for 97% of its energy needs. This dependence has left our nation vulnerable to various externalities that have placed undue burdens on the domestic economy. In fact, a 2005 study by Oakridge National Laboratory confirmed that the U.S. economy has lost trillions of dollars in the past 30 years due to our oil dependence. A recent blog post in the Washington Post put this figure in real terms: [EPA-HQ-OAR-2010-0799-9539-A2, p. 3]

In 2011, the United States paid about $125 billion more for oil imports than it did in 2010 (thanks, in part, to the disruptions caused by civil war in Libya). That “oil tax” was essentially enough to wipe out the entire stimulative effects of Barack Obama’s middle-class tax cut. A similar oil spike this year would cancel out a hefty chunk of the benefits of extending the $200 billion payroll tax cut bill that Congress is fighting over. [EPA-HQ-OAR-2010-0799-9539-A2, pp. 3-4]

The recent volatility and steady rise in oil prices highlights the economic vulnerability of America to foreign sources of oil. For example, OPEC forecasted revenues of over $1 trillion dollars for 2011, which represents a *32.5%* increase since 2010. For comparison, this is approximately 1.6% of global GDP in 2010. With a trade deficit of nearly $500 billion for 2010, eliminating our dependence on foreign oil could cut that deficit nearly in half. These economic benefits are in addition to the number of jobs created by moving to clean technology vehicles like Tesla EVs. As noted earlier, Tesla projects total employment of over 3,000 employees by end of 2012. [EPA-HQ-OAR-2010-0799-9539-A2, p. 4]

Moreover, being dependent on foreign sources of oil from volatile regions of the world requires the U.S. to spend more and more of its military budget on assisting in stabilizing these regions, even as the war in Iraq has ended. Iran’s recent threats to close the Strait of Hormuz (through which about 20 percent of the world’s oil flows) required redeployment of a U.S. Navy carrier group in order to ensure the security of that oil flow. Maintaining a strong and continuous military presence in the Middle East necessitates large expenditures by the federal government to support these operations. Such spending can and does contribute to the national deficit. More importantly, this puts America’s young men and women serving in the military in harm’s way to feed our national thirst for ever more oil resource. Reducing our dependence on foreign oil is, therefore, more than an environmental issue; it is a matter of economic and national security. [EPA-HQ-OAR-2010-0799-9539-A2, p. 4]

The U.S.’s dependence on oil – both of foreign and domestic origin, has been due in part to a verifiable lack of competitive market alternatives. Due to developments by innovative companies like Tesla Motors, alternative technologies are emerging as true competitors to the oil dominated marketplace. EPA and NHTSA are in a unique position to help push this innovation through a robust GHG/CAFE final rule. In fact, as is demonstrated below the case for EV technology is so compelling, EPA's and NHTSA's proposed standards are not only a step in the right direction; they can be further strengthened to encourage cost-effective, feasible EV technology. [EPA-HQ-OAR-2010-0799-9539-A2, p. 4]

Organization: Union of Concerned Scientists (UCS)

Energy Security & Oil Savings

The proposed standards will also dramatically reduce U.S. oil consumption by as much as 1.5 million barrels per day (mbd) – roughly 23 billion gallons of gasoline annually – in 2030 alone. This is equivalent to 2010 U.S. imports from Saudi Arabia and Iraq combined. And the cumulative oil savings of the National Program (MYs 2012-2025) could result in a total reduction in U.S. oil consumption of nearly 3.5 mbd in 2030, nearly double the amount the U.S. currently imports from the entire Persian Gulf. No other federal policy has delivered greater oil savings, energy security benefits, or greenhouse gas emissions reductions to the country. [EPA-HQ-OAR-2010-0799-9567-A2, p. 4]

It appears that the agencies did not fully account for key societal benefits in the proposed rule. Specifically, the agencies did not account for the economic benefits from reduced oil imports for either the 'monopsony' effect or U.S. military expenditures. In both cases, real-world experience would dictate there are clear benefits to the United States. First, the U.S. spends significant resources defending oil shipping channels around the world and responding to threats of terrorism, which are often funded with profits from oil sales.20 We appreciate the agencies concern that it is a challenge to quantify these costs, however, such potentially significant costs cannot be discounted. For instance, a recent peer-reviewed study found that the U.S. military spent $7.3 trillion maintaining aircraft carriers in the Persian Gulf from 1976-2007.21 Since this presence is largely purposed to protect key oil shipping lanes, it provides an indication of the significant cost to the U.S. economy as a result of our reliance on oil. [EPA-HQ-OAR-2010-0799-9567-A2, pp. 5-6]

Further, the agencies state that they did not include the benefits of the monopsony effects because of "the redistributive nature of this 'monopsony effect' when viewed from a global perspective." The agencies elaborate: "Although there is clearly a benefit to the U.S. when considered from a domestic perspective, the decrease in price due to decreased demand in the U.S. also represents a loss to other countries." This argument runs counter to the original intent of the CAFE program and its stated requirement to consider the need of the United States to conserve energy (49 U.S.C. 32902). Congress has consistently set CAFE standards for the exact purpose of delivering "energy security through improved vehicle fuel economy."24 Energy security includes, though is not limited to, reducing U.S. exposure to volatile global oil markets, regardless of whether this results in an economic loss to oil-producing nations. To exclude this benefit when it is so fundamentally tied to the goals of the CAFE program is an abdication of NHTSA's statutory responsibility. [EPA-HQ-OAR-2010-0799-9567-A2, p. 6]

Our continued dependence on oil puts our economy at risk from the effects of oil price volatility and energy insecurity. Oil price spikes were associated with most of the U.S. recessions in the past 40 years. The United States currently sends $1 billion each day to foreign countries to pay for oil and other petroleum products—that is equivalent to more than half of the average daily U.S. trade deficit over the last decade. [EPA-HQ-OAR-2010-0799-9713-A1, p. 2]

Finally, as UCS has noted in prior comment submissions, AEO's projection does not account for inevitable price spikes that will occur during the lifetime of the vehicles assessed under this rule. Such spikes are closely tied to our nation's inflation and GDP, and thus can have serious economic consequences. With this in mind, the agencies should attempt to quantify the benefits of reduced susceptibility to such spikes, and incorporate them into the program's benefits writ large. [EPA-HQ-OAR-2010-0799-9567-A2, p. 13]

---

20 See, for example, The Saudi Connection: How billions in oil money spawned a global terror network. U.S. News & World Report. December 7, 2003. http://www.usnews.com/usnews/news/articles/031215/15terror.htm. Accessed February 10, 2012. [EPA-HQ-OAR-2010-0799-9567-A2, p. 6]

21 http://www.princeton.edu/oeme/articles/US-miiltary-cost-of-Persian-Gulf-force-projection.pdf [EPA-HQ-OAR-2010-0799-9567-A2, p. 6]

24 The 2007 Energy Independence and Security Act contained increases to CAFE standards under Title 1, which carried the title "ENERGY SECURITY THROUGH IMPROVED VEHICLE FUEL ECONOMY" [EPA-HQ-OAR-2010-0799-9567-A2, p. 6]

America's dependence on oil puts our health and our environment and our national security at risk. Whether it's the threat of international terrorism, the devastating impact of global climate change or lost income and jobs due to oil price shocks, the damage caused by American's heavy

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 215-216.

Organization: Thirty Senators from the United States Senate

The proposed standards have broad industry support, but they will also reduce petroleum use and pollution on an aggressive schedule, as Congress required in the 2007 statute. As the latest Energy Information Administration's Annual Energy Outlook has concluded, increases in fuel economy have contributed to our declining dependence on oil imports. [NHTSA-2010-0131-0264-A1, p.1]

Further progress will be made with the implementation of the proposed standards, which taken together with the recently adopted standards for model years 2012 to 2016, will remove the need for as much as 3.8 million barrels of petroleum per day by 2030. Consumers will save thousands of dollars at the pump over the lifetime of their vehicles, and both our economy and our security will be less dependent on imported oil. [NHTSA-2010-0131-0264-A1, p.2]

Organization: Lieutenant General Rick Zilmer (Retired)

On 01/19/2012 at Philadelphia, PA, Lieutenant General Rick Zilmer (Retired) testified in support of this rule. Highlights from his testimony are below:

- He discussed the findings of a recently completed study entitled, "Ensuring America's Freedom of Movement, a National Security Imperative to Reduce U.S. Oil Dependence", developed by the Military Advisory Board at the Center for Naval Analyses (CNA). He testified that "[t]his…study looked a little bit outside of our lane by bringing it into looking at what the potential would be for incorporating the use of alternative fuels to reduce our dependency on U.S. oil and U.S. oil imports into this nation." He went on to testify that there are about 11 members on the Military Advisory Board and between them, they have 400 years of collective experience.

- In the study, it concluded that "…if the Strait of Hormuz closed for 30 days, it would bring our trucking industry to its knees, it would reduce our gross domestic product by somewhere in the order of four billion dollars just over a 30-day period."

- The study concluded that "[w]e could reduce our consumption within ten years by 30 percent, and we could take some of these emergent technologies of alternatives fuels that are not yet ready for marketplace forces. They need more support. They need policy, national leadership, that is going to create the environment through which these emergent technologies can develop."

- Finally, he testified that "[the energy security/fuel issue is] not going to get solved by hoping and praying that we can drill more. That's not the answer. It's looking to efficiency. And in closing, thank you again, and we do strongly from CNA support and urge the National Highway Traffic Safety Administration and EPA to finalize these rules that will set the bar at 54 and a half miles per gallon by 2025 for this simple reason, better gas mileage is simply a matter of national security."

Response:

The American Council for an Energy-Efficient Economy (ACEEE), America's Natural Gas Alliance (ANGA) and American Gas Association (AGA), American Public Gas Association (APGA), Applied Materials, BlueGreen Alliance, Consumer Federation of America, Detroit NAACP, Ecology Center, Environmental Defense Fund, International Council on Clean Transportation, National Wildlife Federation, a Representative from the Michigan House of Representatives (489th District), a Senator from the Michigan State Senate (District 18), Pew Charitable Trusts, Renewable Energy Long Island, Securing America's Future Energy, Sierra Club, Environment America, Safe Climate Campaign, Clean Air Council, Tesla Motors Inc., Union of Concerned Scientists, and thirty Senators from the United States Senate and a couple of private citizens (Kobus, Smith) all commented that the U.S. transportation sector is highly dependent upon foreign oil, and that this rule will have the beneficial effect of reducing that dependency. R. Mark questioned the effectiveness of previous CAFE standards and suggested that the current rule would have little impact on U.S. oil import reductions. We agree with the vast majority of commenters that this rule will reduce U.S. oil consumption and imports of oil and improve the energy security position of the U.S. Using detailed estimates of future technology penetration and vehicle fleet projections, EPA estimates that this rule will reduce oil consumption in the U.S. by 3.87 billion barrels over the lifetimes of the 2017 to 2025 model year vehicles covered by this rule, which, in turn, will reduce U.S. oil imports. (See Section I.D.2 of the Preamble.)

EPA received numerous comments about the treatment and valuation of energy security benefits from this rule. The American Council for an Energy-Efficient Economy (ACEEE), the Union of Concerned Scientists and the BlueGreen Alliance recommended that the monopsony benefit of the rule be included in EPA's overall estimates of the energy security benefits, since it is a benefit to the U.S. Alternatively, instead of focusing simply upon the economic benefits of lower petroleum prices on consumers, ACEEE specifically commented that the lower price of oil would result in job creation in the U.S. According to ACEEE, the employment benefits of the lower oil prices from the rule should be counted as a benefit to the U.S. as well as the monoposony benefit. EPA continues to view energy security from a global perspective, and therefore excludes the monopsony benefit to the U.S. since this benefit is offset by losses to foreign oil producers. (See Section III.H.8.c of the Preamble for more discussion of this topic.) Also, EPA has not been able to develop a robust estimate of the impacts of lower oil prices on overall economic activity or employment in the U.S. as a result of this rule. Therefore, we cannot draw conclusions as to the employment impacts of a decline in the world price of oil on the U.S. economy. (See Section III. H.12.c. of the Preamble for more discussion of this topic.)

In contrast, the other portion of the energy security premium, the U.S. macroeconomic disruption and adjustment cost that arises from U.S. petroleum imports, does not have offsetting impacts outside of the U.S., and is thus included in the energy security benefits estimated for this program. Therefore, EPA has included only the macroeconomic disruption portion of the energy security benefits to estimate the monetary value of the total energy security benefits of this program. EPA has calculated energy security in very specific terms, as the reduction in both financial and strategic risks caused by potential sudden disruptions in the supply of imported petroleum to the U.S. Reducing the amount of oil imported reduces those risks, and thus increases the nation's energy security. (See Section III.H.8.b of the Preamble for more discussion of this topic.)

The Defour Group commented that there is no relationship between the energy security benefits of the U.S. and reduced oil consumption by the U.S., since the world economies are all tied together, thus calling into question estimates of the energy security benefits of these rules. As mentioned above, EPA does not count economic transfers between countries as a part of the energy security benefits of this rule, but we do count the macroeconomic disruption component of the energy security premium, which directly influences the performance of the U.S. economy. The macroeconomic disruption component of the energy security premium is specific to the U.S.

Moreover, the Defour Group believes there is too much uncertainty in generating energy security premiums, and asserted that the energy security premiums are not a credible approach to providing estimates of energy security benefits of the rule. The EPA sponsored an extensive peer review of the methodology on which the energy security benefits for the rule is based. (See Section III.H.8.b of the Preamble for more discussion of this topic.) The methodology of estimating the energy security benefits of particular actions, policies, and rules has been well documented and is well accepted by the energy security community. Thus, EPA continues to use the current methodology for estimating the energy security benefits of our rules.

Many commenters in both written comments and at the public hearings expressed their belief that these standards will have significant benefits for U.S. military-related energy and national security. A number of commenters, including consumer advocacy and environmental organizations, organizations representing labor, and state and local governments, as well as energy security advocates and numerous private individuals, felt that the EPA should quantify, to the extent possible, a military component of the energy security benefits associated with this rulemaking. These commenters felt that, although they understand that the EPA would have difficulties in determining a point estimate of the energy security benefits from reduced military costs as a result of the rule, that even ranges would be useful. The American Petroleum Institute suggested that quantification of this category of benefits—U.S. energy security and national security benefits—was too difficult, and it should be left unquantified.

As Lieutenant General (Ret.) Richard Zilmer, commander of U.S. coalition forces in Anbar province in Iraq in 2006-2007, testified at the Philadelphia public hearing in support of the proposed standards: "better gas mileage is simply a matter of national security." Lt. Gen. (Ret.) Zilmer contributed to a report of the Center for Naval Analyses (CNA) that discussed the implications of oil import reductions and energy security. The report focused on changes in the American transportation sector, in terms of fuel efficiency, alternative fuels, and transportation habits that would be needed in order for the U.S. economy to have enough resilience to sustain a drastic disruption in oil supply. Among its findings and recommendations, the report states that "[t]he federal government fuel economy standards have proven to be effective at increasing efficiency and reducing the use of oil...These standards should be supported and strengthened as a means of making our nation more secure." The report states that "[t]he benefits of efficiency are so obvious and sizeable that it is amazing to consider how or why our country has failed to insist on (or at least incentivize) it up to now.¨

One of the goals of a U.S. military presence in the Persian Gulf is to avoid the impacts oil price shocks from a supply cut-off on the U.S. economy. Although CNA did not conduct an economy-wide analysis of an oil supply shock, it did consider the impact of such a shock on one industrial sector that is heavily dependent on petroleum: the U.S. trucking transportation industry. CNA then considered a 100 per cent disruption in the flow of oil, lasting 30 days in the Strait of Hormuz. They estimated that such a disruption would have caused losses of $3.3 billion or 2.9 percent of the U.S. trucking industry's output in 2009. According to CNA, this disruption would have caused 37,500 truckers to lose their jobs. This analysis concludes with "[i]f the U.S. – and this industry in particular – could reduce its use of petroleum by 30 percent, the effect of such supply disruptions would be nearly zero." Although CNA's report focused on the trucking sector, EPA believes that these findings are The Department of the Navy has also stated that the Navy and Marine Corps rely far too much on petroleum, which "degrades the strategic position of our country and the tactical performance of our forces. The global supply of oil is finite, it is becoming increasingly difficult to find and exploit, and over time cost continues to rise." In remarks given to the White House Energy Security Summit on April 26, 2011, Deputy Security of Defense William J. Lynn, III noted the direct impact of energy security on military readiness and flexibility. According to relevant to this rule since both the heavy-duty and light-duty vehicles in the U.S. are highly dependent upon petroleum.

Moreover, the military itself is heavily dependent on oil. To maintain such military effectiveness and flexibility, the Department of Defense identified in the Quadrennial Defense Review that it is “increasing its use of renewable energy supplies and reducing energy demand to improve operational effectiveness, reduce greenhouse gas emissions in support of U.S. climate change initiatives, and protect the Department from energy price fluctuations.” Deputy Security Lynn, “Today, energy technology remains a critical element of our military superiority. Addressing energy needs must be a fundamental part of our military planning.”

EPA’s analysis of energy security benefits from reducing U.S. oil imports did not include an estimate of potential reductions in costs for maintaining a U.S. military presence to help secure stable oil supply from potentially vulnerable regions of the world because attributing military spending to particular missions or activities is difficult.

SAFE commented on a study by RAND that showed the ongoing expense of oil dependence to the U.S. military. RAND considered military force reductions and cost savings that could be achieved if oil security were no longer a consideration. Taking two approaches, and guided by post Cold-War force draw downs and by a top-down look at the current U.S. allocation of defense resources, RAND concluded that $75–$91 billion, or 12–15 per cent of the U.S. defense budget in 2009 could be reduced if U.S. dependence on imported oil were eliminated entirely. However, the study also concludes that the reduction in military costs from a partial reduction in the U.S. dependence on imported oil would be minimal.

America’s Natural Gas Alliance, the American Gas Association, and Tesla Motors, Inc. pointed specifically to the expense of maintaining naval forces in the Persian Gulf as an important factor in this rulemaking. EPA reviewed a study by Stern that presents an estimate of military cost for Persian Gulf force projection, addressing the challenge of cost allocation with an activity-based cost method. Stern used information on actual naval force deployments rather than budgets, focusing on the costs of aircraft carrier deployment. For the 1976–2007 time frame, Stern estimated an average military cost of $212 billion per year and $500 billion for 2007 alone, that could be potentially reduced will lower oil imports.

Although these recent studies provide significant, useful insights into the military components of U.S. energy security, they do not provide enough substantive analysis to develop a robust methodology for quantifying the military components of energy security for this rulemaking. Even for studies that provide insight into the attribution of specific missions to the objective of securing international oil production and distribution, they provide little guidance on the degree to which incremental reductions in the U.S. dependence on imported oil would reduce or eliminate those missions or programs. Thus, while EPA plans to continue to review newer studies and literature to better estimate the military components of U.S. energy security benefits, for this rulemaking EPA continues to exclude military cost components in our quantified energy security benefits. (See Section III.H.8.e of the Preamble for more discussion on this topic.) To summarize, EPA has been unable to calculate the monetary benefit that the United States will receive from the improvements in national security expected to result from our standards.

18.6. Other Impacts

Organizations Included in this Section

National Wildlife Federation (NWF)

Organization: National Wildlife Federation (NWF)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 28-29.]

The 20 million barrels of oil America uses every day accounts for 40 percent of the U.S. carbon pollution load that causes climate changes. Meanwhile, when drilling projects go wrong, whole ecosystems are threatened by disasters like the Deepwater Horizon spill in 2010, and smaller leaks and spills like the recent Enbridge oil spill here in Michigan. Recent pipeline spills do grave harm right in our backyards: to residents, to wildlife like herons, muskrats, and ducks and geese and destroy decades of community efforts that were intended on restoring rivers like the Kalamazoo. Today we have real opportunity to combat these threats.

Response:

EPA has estimated that there will be significant fuel savings associated with the final standards. In addition to the monetized fuel savings benefits EPA has estimated in its cost-benefit analysis, it is likely that there are many additional impacts associated with the standards that have gone unquantified due to data, methodological, or resource limitations (for example, see RIA Chapter 6). To the extent that there are omitted beneficial impacts associated with reducing fuel consumption like those listed by the commenter, our benefits analysis can be considered conservative. However, such an analysis was beyond the scope of this rulemaking.

18.6.1. Added Costs from Congestion, Accidents, and Noise

Organizations Included in this Section

American Road & Transportation Builders Association (ARTBA)
Mercedes-Benz USA, LLC

Organization: American Road & Transportation Builders Association (ARTBA)

Further, to improve traffic flow and reduce emissions and fuel waste, we must increase surface transportation system capacity. VMT has grown by over 150 percent since the 1970s. In stark contrast, the number of new lane miles in the United States has increased by only six percent. Providing additional lane miles requires a significant investment in our nation’s future and we must update the HTF to adequately reflect changing circumstances. [EPA-HQ-OAR-2010-0799-9403-A1, p. 3]

Congestion levels have grown continuously between 1982 and 2007. Since 1982, the number of hours spent in congested traffic in the nation’s largest metropolitan areas increased from 21 hours to 51 hours. In addition to losing valuable time in traffic, travelers are also wasting an estimated 4.2 billion gallons of fuel due to congestion. 4 Simply put, the nation's road system is falling far behind growth in usage. The direct consequence is rampant traffic congestion and, with it, unnecessarily increased emissions and pollution. [EPA-HQ-OAR-2010-0799-9403-A1, p. 3]

Insufficient capacity already produces specific bottlenecks cause 50 percent of total congestion on the nation's freeways. In 2004, a study of the nation's most severely congested highways highlighted the reality that significant reductions in emissions require a reduction in vehicle time traveled, not vehicle miles traveled. The study concluded that modest improvements to traffic flow at 233 bottlenecks would reduce carbon dioxide emissions by as much as 77 percent and conserve more than 40 billion gallons of fuel over a 20-year period.5 These fuel savings translate directly into lower CO_2 emissions. [EPA-HQ-OAR-2010-0799-9403-A1, p. 3]

---

4 Texas Transportation Institute, 2009 "Urban Mobility Report,"2009.

5 Unclogging America's Arteries, Effective Relief for Highway, Cambridge Systematics, Inc., February 2004

Organization: Mercedes-Benz USA, LLC

The Relationship Between Congestion, Fuel Use and GHG Emissions Is Well Established

Congestion has a direct and well-documented impact on fuel economy and emissions. As shown through a 2010 Urban Mobility Report developed by the Texas Transportation Institute, traffic congestion has resulted in billions of gallons of wasted fuel each year: [See chart on p. A-9 of Docket number [EPA-HQ-OAR-2010-0799-9483-A1] [EPA-HQ-OAR-2010-0799-9483-A1, p. A-8]

Response:

While consideration of the need to increase surface transportation system capacity to improve traffic flow and reduce emissions and fuel waste is beyond the scope of this rulemaking, EPA does account for the fact that increased vehicle use associated with the rebound effect contributes to increased traffic congestion. As described in Joint TSD 4.2.7 and Preamble III.H.9, EPA monetizes the higher costs imposed by added delays to drivers and other vehicle occupants in the form of increased travel time and operating expenses.

18.6.2. Benefits of Increased Driving

No comments were received on this topic.

18.6.3. Benefits of Less Frequent Refueling

No comments were received on this topic.

18.7. U.S. Vehicle Sales Impacts

Organizations Included in this Section

Alexandria Hyundai
Alliance of Automobile Manufacturers
American Council for an Energy-Efficient Economy (ACEEE)
American Fuel and Petrochemical Manufacturers (AFPM)
Ceres
Consumer Federation of America (CFA)
Defour Group LLC
Edmunds.com
Environmental Defense Fund (EDF)
National Automobile Dealers Association (NADA)
National Wildlife Federation (NWF)
Natural Resources Defense Council (NRDC)
Northeast States for Coordinated Air Use Management (NESCAUM)
Ross, D.
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Union of Concerned Scientists (UCS)
United Automobile Workers (UAW)
U.S. Coalition for Advanced Diesel Cars
Volvo Car Corporation (VCC)

Organization: Alexandria Hyundai

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 66-67.]

The agencies have acknowledged the technologies needed to meet regulations will increase the cost of vehicles. Thus for all stakeholders involved, including consumers, auto dealers and manufacturers, we must have a clear understanding of how much vehicle costs will increase, and whether consumers will perceive sufficient value in those increases to pay for them.

Organization: Alliance of Automobile Manufacturers

Automakers today are driving this country's economic recovery. Yet, in light of the uncertainty over consumer valuation of fuel savings and other factors, the agencies have not included an estimate of sales or employment impacts in the NPRM or supporting documents. [EPA-HQ-OAR-2010-0799-9487-A1, p.20] [This comment can also be found in section18.8 of this comment summary.]

The agencies need to understand and take these impacts into account to assure that the standards being put in place for MY 2022-25 do not reverse the economic gains and environmental benefits that have come from the industry's recent recovery. [EPA-HQ-OAR-

2010-0799-9487-A1, p.20] [This comment can also be found in section18.8 of this comment summary.]

Organization: American Council for an Energy-Efficient Economy (ACEEE)

For the MY2012-2016 rule, the agencies projected an increase in vehicle sales, using an approach that is equally applicable to the current proposal. The approach considers five years of discounted fuel savings, minus the incremental cost of a more efficient vehicle, as the net added value to the buyer at the time of purchase. As noted in the current NPRM, the change in sales is among the factors determining the impacts of the rule on auto sector employment (NPRM p.75155). Despite this, the agencies do not quantify the sales impacts of the MY2017-2025 rule. We believe that the approach previously taken is reasonable and yields a better estimate than a default value of zero (for change in sales). [EPA-HQ-OAR-2010-0799-9528-A2 p.2]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 112.]

One important question, clearly: What will the higher cost per vehicle do to car sales? This effect can be challenging to predict. But recent evidence from new polls and industry trends suggest a growing demand for fuel economy by consumers. And there, moreover, appears to be a strong link between consumer confidence and the purchase of new cars. So by enacting the proposed standards, EPA and NHTSA could positively influence consumer confidence, pushing it up, and by ensuring that we are moving in a positive direction with our energy use, they are likely to stimulate consumer spending in highly positive ways which, in turn, would result in greater gains from the proposed fuel economy standards. And equally critical, that would drive the positive job and other financial benefits to the U.S. economy.

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

These standards are based on an unreasonably aggressive expectation of increased electrification. The agency predicts that annual sales of hybrids, plug-in hybrids and all electric vehicles could represent 15% of new sales by 2025 (see footnote 13 at 76 Federal Register 74860; 17 – 35% in Figure 5 at 76 Federal Register 75081 for manufacturers with annual sales above 500,000 vehicles; about 30% in Figure 6 at 76 FR 75082 for manufacturers with annual sales 30,000 – 500,000 vehicles). [EPA-HQ-OAR-2010-0799-9485-A1, p.5]

In reality, electric vehicle sales have been a huge disappointment for automakers. The Chevy Volt, the American-made plug-in hybrid that General Motors had high hopes for going into 2011, fell short of GM's planned sales target of 10,000 units for the year. [EPA-HQ-OAR-2010-0799-9485-A1, p.5]

This exuberant and unwarranted optimism also extends to hybrid electric vehicles as shown below: [EPA-HQ-OAR-2010-0799-9485-A1, p.5] [For the figure 'shown below' please refer to EPA-HQ-OAR-2010-0799-9485-A1, p.6]

Organization: Ceres

The analysis concluded that, under the proposed standards, the auto industry as a whole is likely to see sales improve by 4.7%, and profits by 4.2%. The Detroit 3 are in the best position; they are likely to see sales increase by 5%, and profits by 5.2%. The rest of the industry, while benefiting from the standards, does not fare quite as well as the Detroit 3; it is likely to see sales increase by 4.4% and profits by 3.4%. [EPA-HQ-OAR-2010-0799-9475-A1, p. 1]

Organization: Consumer Federation of America (CFA)

VII. AUTOMAKER INCENTIVES: THE AUTO INDUSTRY HAS STRONG INCENTIVES TO COMPLY WITH THE STANDARDS

Globalization of the auto industry means it is no longer possible to be a successful automaker without being able to compete globally. [EPA-HQ-OAR-2010-0799-9419-A1, p. 8]

As shown in Exhibit S-7, the proposed standard brings U.S. standards up to international levels. [Exhibit S-7 can be found on p. 10 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, p. 8]

The proposed standard reduces the supply-side risk of introducing new fuel savings technologies and triggers competition around fuel economy. [EPA-HQ-OAR-2010-0799-9419-A1, p. 8]

Automakers know they can sell quality. As shown in Exhibit S-8, according to statistics compiled by the Bureau of Labor Statistics, which is responsible for the Producer Price Index, [Exhibit S-8 can be found on p. 11 of Docket number EPA-HQ-OAR-2010-0799-9419-A1] [EPA-HQ-OAR-2010-0799-9419-A1, p. 10]

- Over the past fifteen years, automakers have added three times as much value (and cost) with optional improvements in quality than mandatory (safety and environmental) improvements.
- The overall increase in MSRP tends to track closely to the increase in real disposable income.
- The cost increases that the long-term standards will require over the next 15 years are well below the cost of quality improvement over the past 15 years.
- Unlike most other quality additions, fuel economy improvements deliver pocketbook savings to consumers.
- In today’s market, fuel economy is a major determinant of vehicle quality that the market can easily absorb. [EPA-HQ-OAR-2010-0799-9419-A1, p. 10]

And that leads me to the fourth and most important reason. There is no sticker shock here, none whatsoever. There is no big jump year to year. It's a slow increase in prices. There are uniform price increases across all manufacturers because they all have to comply.

The cost of driving goes down. The value of vehicles goes up. There is no reason to believe that consumers will not buy these vehicles. And in fact, they've shown by their attitudes and the behaviors they are ready to do so.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 59.]

Car dealers have expressed concern about jobs and dealerships, implying that the standards might further hurt them.

Organization: Defour Group LLC

IV. Impact of the Standard on Industry Sales and Employment

Assuming the agencies' baseline sales of 17 million units in 2025, assuming a baseline combined auto and light truck retail transactions price of $28,000 per light duty vehicle ($2009), and assuming, with the agencies, a -1.0 industry demand price elasticity, our lower bound estimate of $1900 per vehicle net welfare loss yields a loss of 1.1 million industry combined car and light truck sales in 2025 relative to the MY 2016 baseline. Further assuming, also with the agencies, that every 1,000 unit sales provides 11.3 auto and supplier jobs yields a loss of just over 100,000 auto industry and supplier jobs. We estimate another 35,000 jobs lost at auto dealers, based on BLS data, which brings the total to a loss of 135,000 jobs in MY 2025 (rounded to the nearest 5,000 jobs). [EPA-HQ-OAR-2010-0799-9319-A1, p. 9]

Our mid-range estimate for industry sales losses is 1.8 million units relative to the baseline, which translates into a loss of 155,000 jobs in manufacturing and supply, plus another 50,000 jobs in distribution for a total job loss of 205,000 jobs in auto manufacturing, supply, and distribution. [EPA-HQ-OAR-2010-0799-9319-A1, p. 9] [Cross-referenced with section 16.8]

By comparison, the EIA estimates a loss of 8% of industry sales in 2025 for a 46.1 mpg standard relative to the baseline. Scaling this estimate up to the mandated 49.6 mpg yields a loss of 10.3% of industry sales or 1.8 million units off the 17 million unit baseline sales —the same as our mid-range estimate. This further translates into the identical loss of 205,000 in the manufacture, supply, and distribution of cars and light trucks. [EPA-HQ-OAR-2010-0799-9319-A1, p. 9]

All of these estimates are extremely conservative because they assume the 34.1 mpg mandate for MY 2016 as their baseline. This is inconsistent with the mainstream research cited in Part II and that found baselines of 23 mpg much closer to the level beyond which consumers would be unwilling to pay for increases in fuel economy. The laws of declining marginal benefits (utility) and increasing marginal costs imply that the actual level of net consumer welfare losses and the attendant sales and employment losses are exponentially higher. [EPA-HQ-OAR-2010-0799-9319-A1, p. 9]

Organization: Edmunds.com

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 103-104.]

Decreased competition or innovation of any features, including fuel economy, poses the risk that vehicles will be less differentiated, and thus offer decreased utility to certain consumers, especially those who strongly value the affected features. This could decrease new car sales, if consumers are less motivated to replace their cars as frequently and/or if consumers turn to used cars. Given the sizable contribution of auto sales to the U.S. economy, any slowdown in auto sales has the potential to generate significant adverse effects in other parts of the economy as well.

Secondly, the current proposal needs to demonstrate a fuller understanding of consumer demand for vehicles and how adding higher prices, decreased innovation and choice, and excessively complex information could affect consumer decision-making on new vehicle purchases and potentially result in lower auto sales.

Organization: Environmental Defense Fund (EDF)

H. FINAL RULE SHOULD INCLUDE QUANTITATIVE ESTIMATES OF VEHICLES SALES AND AUTO MANUFACTURING EMPLOYMENT BENEFITS

EPA and NHTSA conducted quantitative vehicle sales and auto manufacturing employment analyses in previous rulemakings and had prepared an estimate of these same indices for the rulemaking action at issue here using the same methodologies. However, the results of these analyses were not included in the published proposal. The changes occurred during the OMB review process. The docket for this rulemaking includes interagency drafts of the proposal submitted to OMB with the quantitative analyses included. The docket also includes the request by OMB to remove the quantitative analyses from the proposal33 and responses from EPA and NHTSA stating the importance of the quantitative analyses and requesting they be left in the final proposal.34 See Attachment B. We incorporate this document as an integral part of EDF's comments for inclusion in the administrative record for this rulemaking action. [EPA-HQ-OAR-2010-0799-9519-A1, p. 14]

We respectfully request that the quantitative vehicle sales and auto manufacturing employment benefits be included in the final rule to fully reflect the comprehensive societal benefits of the proposed program. [EPA-HQ-OAR-2010-0799-9519-A1, p. 14]

[The above comments can also be found in section 18.8 of this comment summary.]

i. VEHICLE SALES

EPA and NHTSA conducted a vehicle sales analysis in previous rulemakings by comparing the up-front costs of the vehicles with the present value of five years' worth of fuel savings. The Agencies used the same methodology to quantify vehicle sales impacts for the current proposed standards, finding that in 2025, combined new car and light truck sales could increase by an estimated 644,000 vehicles.35 However, these results were not included in the final proposed rulemaking, which states, "This rule takes effect for MY 2017–2025. In the intervening years, it is possible that the assumptions underlying this analysis, as well as market conditions, might change." (Proposal preamble, page 75,151) The proposal therefore concludes, "In light of the relevant uncertainties, the agency therefore decided not to include a quantitative sales estimate…" (Proposal preamble, page 75,320) While we agree that uncertainties indeed exist in such an analysis, we strongly believe that a quantitative analysis should at the very least have been presented in the proposal for the public to review and comment on. We strongly encourage the Agencies to include quantitative vehicle sales estimates in the final rule to reflect full transparency and the true estimated benefits of the proposed standards [EPA-HQ-OAR-2010-0799-9519-A1, pp. 14-15]

Organization: National Automobile Dealers Association (NADA)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 69-71.]

But dealers are concerned about the accelerated schedule in this proposal. The mandates for model year 2011 to 2016 just now being implemented aggressively move up the 2020 goal of 35 miles per gallon by four years. If this proposal aims to set mandates for model years 2017 through 2025, five of the thirteen years out in the future will more than double the fuel economy of the vehicles I now sell.

The showroom realities I see suggest that we should take the time to evaluate how consumers react to the higher-mileage/higher-cost vehicles manufacturers will build in the next few years. In other words, if we want, if we wait two years, manufacturers would still have the time necessary to comply and we would all have better data on which to make decisions. Sales of new vehicles were 12.7 million last year, a far cry from the 17-plus million in the high water market in the mid 2000s, but much better than the 10.4 million sold in 2009.

Dealers embrace the pivotal role we are playing to help lead our nation back to the road of prosperity, but we are wary of anything that might depress sales and turn back the gains being made. Simply put, before rushing head-long into a new set of mandates aimed at doubling today's fleet fuel economy, we need to know better what the ramifications will be.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 94.]

Next month NADA intends to release a detailed analysis of the proposal's impact on sales, especially with respect to certain sensitive market segments.

[Supplemental comments to the testimony]

IV. Consumers Unable to Afford or Unwilling to Pay Higher Prices Have Other Options

New light-duty vehicle sales plummeted in 2008 and 2009, largely due to the recession. The measurable increases in average new light-duty vehicle fleet fuel economy performance which have occurred since then must be balanced against a dramatic reduction fleet turnover. Currently, the in-use fleet is the oldest it has ever been (almost 11 years, on average). Annual new light-duty sales have increased steadily since 2009, but have a long way to go before reaching the once "normal" 16 million vehicles per year level. As noted in NADA's comments, effective fuel economy mandates must enhance new light-duty sales and fleet turnover, not retard them, especially given that increases in average new vehicle fuel economy otherwise is expected to occur "naturally" as fuel prices trend higher. [NHTSA-2010-0131-0267-A1, p.4]

Organization: National Wildlife Federation (NWF)

Overall, in 2011, a new study out this week confirms month by month increases in new vehicle fuel efficiency, while, despite continued economic uncertainty, vehicle sales were up about 10% - far outpacing overall economic growth. 6 7 [EPA-HQ-OAR-2010-0799-9887-A2, p. 4]

---

6 http://www.umich.edu/~umtriswt/EDI_sales-weighted-mpg.html

7 http://www.ihs.com/products/global-insight/industry-economic-report.aspx?id=1065931875

Organization: Natural Resources Defense Council (NRDC)

EPA and NHTSA should include a sales impact assessment using a methodology consistent with previous rules. [EPA-HQ-OAR-2010-0799-9472-A2, p. 4]

NHTSA should not use a vehicle choice model in its CAFE assessment without opportunity for public review and comment. [EPA-HQ-OAR-2010-0799-9472-A2, p. 4]

Organization: Northeast States for Coordinated Air Use Management (NESCAUM)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 71.]

As part of the basis for the proposed rates of improvement, EPA projects that battery electric vehicles and plug-in hybrid electric vehicles will account for as little as one percent of sales in 2021 and three percent of sales in 2025.

Yet nearly every major auto manufacturer will have EVs and PHEVs in production within the three years -- within three years.

EPA and the Department of Transportation previously estimated that a fleet-wide six-percent annual rate of improvement could be achieved with as little as four percent combined sale share of EVs and PHEVs in 2025, provided that sales of conventional hybrids continue to increase.

Four counts of significant reductions in the weight and cost of electric vehicle technologies further support our conclusion that the most increase in sales of these advanced technology vehicles require to achieve a fleet-wide six-percent annual rate of improvement is viable.

Organization: Ross, D.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 243.]

Now some automobile dealers groups claim harm through lost sales and lost jobs. In reality, all else equal, the projected drop in the net cost of vehicle ownership will result in an increase in sales.

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

The new proposed standards will continue push improved technologies into the market and boost auto sales. In their initial submission to OMB, the agencies conducted a basic sales analysis and concluded that the effect on vehicle sales would be positive. Assuming a 3% discount rate, the agencies found that car sales would increase by 319,700 in 2025 and truck sales would increase by 324,600.13 This analysis was similar to that done in the 2012-16 rule. The final rule should include ta sale analysis consistent with that done for the prior rule. [EPA-HQ-OAR-2010-0799-9549-A2, p. 4]

---

13 EO12866 Review-Interagency Review material Part 1- 2017-2025 Vehicle GHG and Fuel Economy Standard and NPRM 2060 AQ54, Document ID: EPA-HQ-OAR-2010-0799-1224, pgs. 891-892 of PDF [EPA-HQ-OAR-2010-0799-9549-A2, p. 4]

Organization: Union of Concerned Scientists (UCS)

Sales of new light-duty vehicles are also projected to increase under these standards. The Ceres analysis found an increase of light-duty vehicles sales compared to business as usual, resulting in an additional $37.4 billion in sales 2030.8 While not included in the proposed rule, interagency review documents show that EPA has projected a 2.8% increase in car sales and a 5.7% increase in light truck sales compared to business as usual.9 [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 217-218.]

A recent report from CERES found that standards similar to those proposed by the agencies would create nearly 500,000 new jobs nationwide in 2030.

Moreover, better fuel efficiency and greenhouse gas performance will improve the competitiveness of the American auto industry.

In 2008, in the face of rising gas prices and declining economy, American auto makers were ill prepared to meet consumers' needs. These standards will ensure that manufacturers continue to innovate over the coming decade, providing consumers clean and efficient vehicle choices that will help them fight for years to come.

8 Ceres. More Jobs Per Gallon. Management Information Services, Inc. July, 2011. p. 14 [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

9 Interagency review document, EPA-HQ-OAR-20100799-1224, Joint Rulemaking to Establish 2017 and Later Model Year Light Duty Vehicle GHG Emissions and CAFE Standards, p. 891-892. [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

Organization: United Automobile Workers (UAW)

Unfortunately, this has become as much a political concern as an analytical one, which the UAW believes is to the detriment of a broader view of the demand for light-duty vehicles in the United States. New vehicle sales are largely driven by employment and income levels and the need for replacement vehicles as older vehicles are taken out of service. For example, the drastic reduction in vehicle sales that occurred in model year 2009 was caused by the economic crisis, and nearly all observers agree that auto sales will increase only to the extent that the economy continues to recover. [EPA-HQ-OAR-2010-0799-9563-A2, pp.6-7]

The history of light-duty vehicle sales over the period that CAFE has been in effect shows that economic factors, not changes in CAFE requirements, are the main determinant of vehicle sales. The chart below provides a quick visual reference that shows no evident relationship between CAFE and sales when viewed in the context of the overall level of sales. [EPA-HQ-OAR-2010-0799-9563-A2, p.7] [To see the chart below please refer to EPA-HQ-OAR-2010-0799-9563-A2, p.7]

While the UAW believes that efforts to understand how sales are affected by increased vehicle prices for more efficient vehicles are worthwhile and should be continued, the history of new vehicle sales makes it clear that the best way to increase vehicle sales to former levels is to focus on efforts to improve the economy and increase employment. [EPA-HQ-OAR-2010-0799-9563-A2, p.7]

Organization: U.S. Coalition for Advanced Diesel Cars

Overstated Residual Value: In its 2012-2016 Final Rule, EPA discussed the importance of a vehicle's residual value retention over time as a component of the consumer's total cost of ownership. This language appears again in the current NPRM as EPA states, "it is reasonable to estimate that the added technology to improve CO_2 level and fuel economy will retain the same percentage of value when the vehicle is five years old." In the case of hybrid pickup trucks, the marketplace has proven EPA's estimation to be entirely unreasonable. Leading consumer websites, such as Edmunds and Kelley Blue Book, project hybrid pickup trucks depreciate faster than trucks with standard engine, resulting in the loss of thousands of dollars to consumers at trade-in time. Indeed, the extra depreciation caused by the hybrid content can erase much, if not all, of the fuel savings which can potentially accrue to the consumer. [NHTSA-2010-0131-0246-A1, p.5]

Organization: Volvo Car Corporation (VCC)

The proposed regulations are, and will be, very challenging. One of the challenges is to identify the correct pacing of the introduction to the market of the Advanced Technology Vehicles (ATV) that are anticipated in the proposal. EPA and NHTSA are trying to clarify the environmental needs that are to push a more intensified introduction of ATV's. The intensified introduction of ATV's will create many significant challenges and require risk taking for VCC. [EPA-HQ-OAR-2010-0799-9551-A2, p.2]

Response:

These comments show a diversity of opinion on whether this rule will affect vehicle sales either positively or negatively. Some put the emphasis on up-front costs and predict reductions in vehicle sales; others put the emphasis on the net savings to consumers, based on fuel savings outweighing technology costs over the vehicle's lifetime, and say that vehicle sales will increase. The UAW states that vehicle sales are mostly determined by the overall state of the economy. ACEEE says that enacting the proposed standards could lead to a positive effect on consumer confidence, and thus contribute to stimulating the economy. AFPM expresses concern over "an unreasonably aggressive expectation of increased electrification" of the vehicle fleet, while NESCAUM says that sales of EVs sufficient to meet even more stringent standards than those set here are viable.

As ACEEE, EDF, Sierra Club et al., and UCS note, in the MYs 2012-16 GHG and CAFE rule, EPA conducted a vehicle sales analysis based on a comparison of the tradeoff between the desirability of additional fuel savings and the up-front costs of new vehicles (including sales tax, insurance, and vehicle financing costs). Several of these organizations recommended that we conduct an analysis using the same methodology for this rule. As discussed in Preamble III.H.11 and RIA Chapter 8.1, we do not quantify vehicle sales impacts, because of uncertainties involved in the responses of consumers and automakers in the time horizon of this rule. As the United Auto Workers points out, for instance, the state of the economy is a major, if not the primary, determinant of total vehicle sales. The impact of the rule on sales may therefore depend, among other factors, on changes in the state of the economy. Other commenters discussed the importance of consumer confidence, fuel prices, and even of publicity over fuel prices, in consumers' interest in additional fuel economy. EPA agrees that these factors are important; indeed, fuel prices play an important role in estimating the fuel savings used in analyzing vehicle sales, as discussed in RIA Chapters 5.4 and 8.1.1. For other factors, including consumer confidence and publicity over fuel prices, we acknowledge their potential for impacts on vehicle sales. Even if we did quantify vehicle sales, though, we are not sufficiently confident in quantitative estimates of the impacts of those factors to develop numerical estimates.

Another method to estimate effects on vehicle sales is to model the market for vehicles. Consumer vehicle choice models estimate what vehicles consumers buy based on vehicle and consumer characteristics. As discussed in Section III.H.1.a, Chapter 8.1.2.8 of the RIA, and Section 18.1 of this Response to Comments, EPA has been exploring use of a consumer vehicle choice model, but we consider it premature to use the model in this rulemaking.

The studies by Ceres and by the Defour Group (including the 2011 EIA study cited by the latter) show how the results of vehicle sales analyses depend on the underlying assumptions. The Ceres and Defour analyses, like the method that EPA has used in the past, are based on an adjusted consumer price that reflects the increase in vehicle cost less a proportion of the expected future fuel savings; the EIA study does not consider consumer fuel savings. The per-vehicle technology cost estimates in Ceres' study (for MY 2020) appear to be somewhat lower than EPA's estimates; EIA's cost estimates are higher; and the Defour Group's cost estimates are substantially higher.[85] In the Ceres and Defour cases the estimates take into account estimates of the amount of fuel savings that vehicle buyers consider when deciding what vehicles to buy; EIA does not consider fuel savings. Ceres estimates that vehicle buyers consider 7 years of fuel savings, with sensitivity analysis of 3 to 15 years; we estimate that the Defour Group's estimate, of 25 percent of expected lifetime fuel savings, corresponds roughly to an assumption that buyers consider less than 3 years of fuel savings. Because the Defour Group and EIA analyses uses higher costs and lower benefits than the Ceres analysis, it is unsurprising that the three studies come up with very different vehicle sales estimates. EPA does not endorse the results of any of these studies.

As discussed in Section III.D.6 of the Preamble, in this final rule we project very low rates of EV penetration as part of a compliance strategy for the rule – around 2 percent in MY 2025 – and a combined penetration of strong HEVs, EVs, and PHEVs of around 7 percent (see Preamble Table III-52). We consider these penetration rates to be low enough that the new vehicle market will absorb these vehicles. We note that automakers are not obliged to use electrification as part of their strategies for compliance.

We agree that enacting these standards should contribute to the development and use of advanced technologies that will have applicability for meeting standards in other countries. As a result, vehicles built in the U.S. are more likely to achieve international standards. The ability to design vehicles that meet standards in foreign as well as domestic markets can be expected to reduce costs of design for automakers.

We agree that the macroeconomy both affects and is affected by the auto industry's condition, and by the level of production and sales of autos. The vehicle sales projections that we use for the rule analysis, as discussed in TSD Chapter 1, are based on models that incorporate projections of the economy into the future.

We disagree with Edmunds that there will be decreased competition or innovation of any features. As discussed in Preamble III.H.1, RIA Chapter 8.1, and Section 18.1 of this Response to Comments, it is possible for automakers to achieve both improved fuel economy and maintained levels of other vehicle attributes, including fleet diversity; it should thus be possible for automakers to improve both fuel economy and other vehicle attributes, if consumers are

[85] The Defour Group's cost estimates are based on the technology costs of MYs 2011-25 rulemakings, not the costs just of this rule. EPA considers it appropriate to examine the costs and benefits of this rule, with the impacts of other rules included in its baseline for analysis. In addition, the Defour Group assumes that indirect costs for all technologies equal the direct costs, by using a retail price equivalent multiplier of 2.0; EPA's cost estimates take into account that indirect costs for new technologies vary with the complexity of the technology and the time frame since its adoption. This issue is discussed in detail in TSD Chapter 3.1.2.2.

willing to pay for those other attributes. The agencies' cost methodology in fact includes cost of preserving all vehicle utilities found in the present fleet. See EPA RIA at pp. 1-39 to 40. The rule provides a thorough review of the literature on consumer demand for vehicles and how fuel economy affects it, in Preamble III.H.1 and RIA Chapter 8.1.2.

We do not understand what Edmunds means in expressing concern over "excessively complex information." Vehicle technology has been increasing in complexity probably since the invention of the automobile. For most vehicles, technologies that will satisfy the rule, such as improved transmissions, require little, if any, additional explanation, because their use is unlikely to play much of a direct role in vehicle purchase decisions.

The U.S. Coalition for Advanced Diesel Cars calls into question application of the same residual value to hybrid vehicles as to other vehicles in the cost of ownership analysis. The cost of ownership analysis (see Preamble III.H.5 and RIA Chapter 5.5) does not make use of residual value. The vehicle sales analysis that EPA has used in the past does take into account residual value, as described in RIA Chapter 8.1.1. That vehicle sales analysis was done at an aggregate level, though; it does not have the precision to separate effects for individual models or classes. For that purpose, we consider the use of an average residual value to be appropriate.

18.7.1. Access to Auto Loans and Effects on Low-Income Consumers

Organizations Included in this Section

Consumer Federation of America (CFA)
Consumers Union
Defour Group LLC
Michigan House of Representatives, 49th District
National Automobile Dealers Association (NADA)
Ross, D.
Union of Concerned Scientists (UCS)

Organization: Consumer Federation of America (CFA)

- Automakers adjust MSRP and discounts and auto financing in response to much larger changes in affordability. [EPA-HQ-OAR-2010-0799-9419-A1, p. 10]

Concerns about a negative impact of the standards on consumers and the auto market are unfounded, even in the case of low income consumers because they rest on faulty assumptions that are contradicted by the above analysis. [EPA-HQ-OAR-2010-0799-9419-A1, p. 10]

- When the costs of driving go down, vehicle ownership becomes more affordable, so output and employment in the industry will expand. [EPA-HQ-OAR-2010-0799-9419-A1, p. 10]
- Households with income below $20,000 made up approximately 22 percent of all households in 2010, but they accounted for only 2 percent of the money spent on new vehicles. [EPA-HQ-OAR-2010-0799-9419-A1, p. 11]

- Gasoline expenditures are a much bigger problem for these households. In 2010, households with incomes below $20,000 spent 7.3 times as much on gasoline as they spent on new car payments. [EPA-HQ-OAR-2010-0799-9419-A1, p. 11]
- Low-income households are much more involved in the used car market, in which we see an increase in supply of vehicles and lower prices as the standards accelerate the fleet turnover. [EPA-HQ-OAR-2010-0799-9419-A1, p. 11]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 61.]

So we are not worried about the increase in price associated with the technology because that increase in price will be paid back to the consumer who takes a typical five-month [sic] loan out during that very first month [sic].

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 39.]

By far, the single largest benefit is the reduction of consumer expenditure on gasoline and the decrease in the cost of driving. For the typical consumer who purchases a new auto that complies with the 2025 standard with a 5-year auto loan, the average life of auto loans these days, consumer pocketbook savings will be immediate and substantial.

Organization: Consumers Union

III. Low-Income Households Benefit from the Standards

Car prices have been remarkably stable over the last two decades, even as new features have proliferated and enormous safety gains have been achieved. Improving fuel economy is likely to have a modest price impact at most, while the savings on fuel will be tremendous. These net savings will benefit nearly all consumers, particularly low-income consumers. We are not aware of an in-depth, independent study that analyzes the impact of the proposed standards on low-income households. However, our best estimate is that they will see even greater net benefits. Low-income households pay a disproportionately large portion of their income on fuel, so will benefit greatly from greater fuel economy. At the same time, they are primarily insulated from the costs of the new standards because they account for a very small portion of new car buyers. [EPA-HQ-OAR-2010-0799-9454-A2, p.4]

Low-income consumers are the most vulnerable to price spikes in gasoline. Energy expenses in general and gasoline in particular constitute a disproportionately greater burden for low-income households.9 Decreasing national demand for oil by creating a gas-sipping fleet will help relieve this burden for low-income households. The Consumer Federation of America calculated that in 2010, households with incomes below $20,000 spent 7.3 times as much on gasoline as the spent on new car payments.10 In comparison, households with incomes above $70,000 spent 1.2 times as much on gasoline as they did on new car payments.11 Reducing demand for gasoline and making vehicles more efficient is a very effective tool to combat vulnerability to gas price spikes, which is a real threat to low-income households. Some financial institutions already recognize that lower operating costs lower credit and default risk and offer consumers lower interest rates for vehicles with superior fuel economy.12 [EPA-HQ-OAR-2010-0799-9454-A2, pp.4-5]

Low-income households are more likely to buy used rather than new vehicles, and as a consequence, they have lower depreciation costs than those absorbed by new car buyers. New vehicles lose an average of 65% of their value after five years of purchase.13 If the average cost increase for a new car is approximately $2,000, then the average cost increase of a five-year old car that meets the new standards would be about $700 (35%). The amount of savings depends largely on the starting point for the original vehicle's fuel economy, but earning back the difference (assuming 10% interest loan: $770 difference, assuming cash purchase: $700) could be recouped quickly by fuel savings. For example, moving from 20 to 24 mpg, from 28 to 36 mpg, or from 32 to 44 mpg would provide this level of savings within 2 years.14 Each of these examples is well within the expected average improvement that will result from the new standards, and average savings from the new standards are likely to be even greater. In addition, the standards are likely to diminish the premium often charged for more efficient used vehicles, making "efficiency" as an attribute relatively cheaper. [EPA-HQ-OAR-2010-0799-9454-A2, pp.5-6]

Consumer Reports survey data show that low-income households want more efficient vehicles and support the fuel economy standards. While 59% of respondents in moderate and high-income households expect their next vehicle purchase to have better fuel economy, 71% of low-income households expect to choose a model with better fuel economy.15 While an impressive 78% of moderate and high-income households support fuel economy standards that increase to at least 55 mpg by 2025, an even greater number (85%) of low-income households support these standards.16 Although more expensive cars create a greater initial hardship for low-income households than for higher-income households, 79% of low-income respondents are still willing to pay extra for a more fuel efficient vehicle if they can recover the additional cost through lower fuel costs within five years (compared to 86% of moderate and high-income respondents).17 [EPA-HQ-OAR-2010-0799-9454-A2, p.6]

---

9 - See the Urban Institute's 'Impact of Rising Gas Prices on Below-Poverty Commuters', September 2008 accessed at: http://www.urban.org/UploadedPDF/411760_rising_gas_prices.pdf

10 - CFA's calculations are based on the Bureau of Labor Statistics' Consumer Expenditure Survey, accessible at: http://www.bls.gov/cex/2010/Standard/income.pdf.

11 - Id.

12 - Examples include U.S. Bank, Everence, and Truliant Federal Credit Union.

13 - Kelley Blue Book's 2012 Residual Value Analysis estimates the 60-month residual values for 2012 model-year vehicles average 35.5 percent of their original MSRP after five years of

ownership, accessed at: http://mediaroom.kbb.com/kelley-blue-book-releases-2012-residual-value-analysis.

14 - See Appendix E CR Fuel Saving Chart.

15 - See Appendix D at 24.

16 - See Appendix D at 27.

17 - See Appendix D at 26.

Organization: Defour Group LLC

VI. Impact of the Standards on the Poor

The agencies' assessment of the impacts of their fuel economy proposal fails to consider the proposed standard's severely adverse impacts on the poor and otherwise disadvantaged. A recent study by Professor Mark Jacobsen (University of California at San Diego) found that fuel economy standards are "sharply regressive" and that the costs of fuel economy mandates "fall disproportionately on low-income households." He found, for example, that "low-income households" buying ten-year-old vehicles are "suffering welfare losses (as a fraction of income) more than three times as large as those of the high-income group."[20] [EPA-HQ-OAR-2010-0799-9319-A1, p. 13]

This finding is important because used cars play an essential role in the escape from inner-city poverty. Studies show that car ownership rates are lower among minority groups, and this appears to be a significant factor in explaining the lower employment rates of these groups. A study conducted by researchers at the University of California at Berkeley estimated that raising minority car ownership rates to the white car ownership rate would eliminate 45 percent of the black-white employment rate differential and 17 percent of the comparable Latino-white differential.[21] By raising the cost of vehicle ownership, fuel economy standards work in precisely the opposite direction. [EPA-HQ-OAR-2010-0799-9319-A1, p. 13]

---

20 - Mark R. Jacobsen, "Evaluating U.S. Fuel Economy Standards in a Model of Producer and Household Heterogeneity," Working Paper, January, Stanford and the University of California at San Diego, January 2010.

21 - Steven Raphael and Michael Stoll, "Can Boosting Minority Car-Ownership Rates Narrow Inter-Racial Employment Gaps?" Working Paper W00'002, Berkeley Program on Housing and Urban Policy, Institute of Business and Economic Research, Abstract.

Organization: Representative from Michigan House of Representatives, 49th District

The standards will also save consumers at the pump and help insulate them, especially those on fixed incomes like retirees and seniors, from the volatility of gas prices. As we have a debate here in Michigan about how to adequately invest in our roads and bridges, I will be working to make sure any solution considers how it impacts middle-class families that are already struggling. Increased fuel economy will help them by putting more discretionary income in their pockets so that they can spend more money on other goods and services. Over the lifecycle of a model year 2025 vehicle, consumers will in fact save up to $6,600 in fuel costs, which they can then use to help support local businesses and jobs. [EPA-HQ-OAR-2010-0799-7983-A1, p. 1]

Organization: National Automobile Dealers Association (NADA)

Second, prospective new light-duty vehicle purchasers must have the ability to make a purchase or lease. Ability involves critical factors like financial wherewithal (for most consumers, this means creditworthiness), a driver's license, and for certain alternative and new technology vehicles, the availability of convenient refueling. Third, prospective new light-duty vehicle purchasers must be willing to purchase, assuming they have the need and/or desire and the ability to do so. [EPA-HQ-OAR-2010-0799-9575-A1, p. 2]

The proposal gives remarkably short shrift to these marketplace realities. A cynical view would argue that, under a 'push' mandate, regulators need not care if the vehicles they are mandating actually get sold or leased. These comments do not take that position, but instead suggest that a careful consideration of actual customer behaviors and marketplace realities will enable NHTSA and EPA to leverage customer demand to maximize fleet turnover, thus maximizing program effectiveness. Doing so is critical given that, by a wide margin, the proposal is the costliest of any ever considered for the U.S. automobile industry. [EPA-HQ-OAR-2010-0799-9575-A1, p. 3]

III. THE PROPOSED MY 2017-2025 STANDARDS WILL DRAMATICALLY IMPACT THE ABILITY AND THE WILLINGNESS OF CUSTOMERS TO PURCHASE NEW LIGHT-DUTY MOTOR VEHICLES.

As noted above, the demand for new light-duty motor vehicles, not unlike for most consumer goods, derives solely from and to the degree prospective purchasers need or desire them. Moreover, the demand for new light-duty vehicles is and always will be constrained by choices, including the used vehicle marketplace, vehicle service and repair options, and a variety of transportation alternatives that conceivably may satisfy those same needs and desires. [EPA-HQ-OAR-2010-0799-9575-A1, p. 6]

Assuming the requisite need or desire, prospective purchasers of new light-duty vehicles must have the ability to buy. For most households, a light-duty car or truck is the most expensive consumer purchase they make. Unlike for most other consumer goods, in excess of 90% of purchasers finance the new light-duty vehicles they acquire by means of a credit sale or lease, with less than ten percent involved in all-cash transactions. Thus, the single most important ability factor is creditworthiness. When prospective purchasers lack sufficient creditworthiness to enable a lender or lessor to finance the new light-duty vehicle they need or desire, they must consider other options. In addition to the alternate transportation choices noted above, prospective purchasers may be able to consider a less expensive new vehicle option that meets their needs or desires but, as discussed below, at some point no such new vehicle option will be available. [EPA-HQ-OAR-2010-0799-9575-A1, p. 6]

A. The Ability of Prospective Purchasers of New Light-Duty Purchasers to Pay for the Costs of the Proposed Standards

However much prospective purchasers may need or desire new vehicles covered by the proposal, they must be able to afford them. Of course, other ability factors often come into play, such as meeting legal requirements for a license and obtaining liability insurance, or having reasonably available refueling options for alternative fuel and plug-in vehicles. Importantly, it matters not whether the new vehicles in question offer improved fuel economy performance characteristics compared to the transportation options currently being used by prospective purchasers. When underwriting loans or leases, lenders and lessors simply do not account for whether new vehicles offer more torque or horsepower, improved fuel economy, reduced GHGs, ubiquitous cup holders, or prettier paint. All that matters is whether prospective purchasers are creditworthy, that is, whether they will comply with their payment obligations as spelled out in the loan or lease. Regarding the new vehicles themselves, these decisions principally involve objective criteria and one key factor: the total amount of the up-front cost being financed. [EPA-HQ-OAR-2010-0799-9575-A1, p. 6]

Nowhere does the proposal properly account for ability to pay. Consequently, the proposal significantly understates potential impacts on prospective new vehicle purchasers and overstates regulatory benefits. The paper Attached as Exhibit C lays out, for three cost-increase scenarios, how the proposal will impact on the ability of consumers to pay for vehicles covered by the rule, assuming the need or desire, and willingness, of those prospective purchasers to do so.13 Note that these cost increase scenarios only reflect what it will cost prospective purchasers up front due to the mandates imposed by the MY 2011-2025 standards. They do not take into account other potentially significant regulatory costs above the assumed baseline, including compliance with expected Tier III emissions standards and an array of new safety standards. [EPA-HQ-OAR-2010-0799-9575-A1, pp. 6-7]

The attached paper analyzes Bureau of Labor Statistics Consumer Expenditure Survey data to show how each average per vehicle cost increase scenario will impact the least expensive new vehicle in the market. For example, a regulatory cost of $2,937 (in 2010 dollars) could increase the cost of the least expensive new vehicle to approximately $15,700 versus the current $12,750. In doing so approximately 6.8 million licensed drivers will no longer qualify for a loan on that least expensive new vehicle and thus will have to turn to the other transportation options discussed above. In fact, projected per vehicle average cost increases will knock licensed drivers out of the market for all new light-duty vehicle segments, as illustrated by the fact that, at the same average per vehicle price increase of $2,937, another 6.8 million licensed drivers will no longer qualify for the purchase of the minimum cost new vehicle that accommodates more than 5 people (or more than 2 child safety seats), currently selling for approximately $20,000. EPA and NHTSA must take these significant economic impacts into account, especially given that they have will have the greatest effect on lower income families at the margins of the market. [EPA-HQ-OAR-2010-0799-9575-A1, p. 7]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 54-55.]

Some tout that the cost of the proposal is essentially free because of fuel savings. But before any fuel savings can be realized, customers must have the ability to buy. For over 90 percent of Americans, the purchase of a new vehicle is contingent on getting approved for a loan or a lease. If they don't qualify, they can't buy. They can't buy, they can't save money on fuel.

So as someone who works every day to secure financing for my customers, I'm unaware of anybody who will fund auto loans based on the promises of fuel savings. Loan qualification is based mainly on the income of the customer and on the vehicle price. What's clear is this proposal will make it harder for many customers to obtain financing, eliminating their ability to realize any fuel savings.

Specifically, NADA is preparing an analysis that conservatively estimates that about 7 million licensed drivers will be priced out of the new car market entirely when this proposal is fully implemented. But this consequence is not limited to those motorists who can only afford the most inexpensive vehicle. Let's talk about the family buyer. For example, our study also estimates that over 7 million licensed drivers would no longer qualify for financing to buy the lowest cost family vehicle, such as the Dodge Journey, which accommodates more than five people or more than two child passenger safety seats. This will be devastating for large families or families with small children that would like to carpool. And the burden of this rule is not even spread evenly. California, the most populous state, will see 662,000 of its citizens no longer able to qualify for a new car loan. In Tennessee, 5 percent of licensed drivers will be shut out of the new car market.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 53-55.]

Moreover, the U.S. Energy Information Administration finds that this proposal will regulate out of existence the most affordable cars on the market today. Adjusting for inflation, the Energy Economic Information Administration claims that in 2025, there will no longer be new vehicles on the market costing $15,000 or less. These are the vehicles I sell to smart frugal buyers, college students and working families. How can a rule that eliminates the most affordable new cars on the market be pro-consumer? You're right; it's not.

[This comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 57.]

We all want fuel economy, but it's not free. By adding $3,200 to the cost of a car, over seven million Americans will be priced out of the market, fleet turnover will be reduced and global warning benefits will be delayed. [Supplemental comment to testimony]

II. Financing Constraints Limit New Light-Duty Vehicle Affordability

NADA's February 13th comments discussed at length the incontrovertible fact that affordability limits the new vehicle marketplace. For any given vehicle price increase, some portion of the market for that vehicle will disappear to the extent that they will be unable to qualify for a loan or lease. This issue is critical given that over 90% of all new vehicle transactions involve loans or leases, but is by no means limited to price increases associated with fuel economy or emissions mandates. At the same time, the fact that a vehicle's higher price is associated with an improved performance characteristic (fuel economy or otherwise) is of no consequence to lenders and lessors as they almost exclusively focus on the likelihood of prospective borrowers or lessees to repay their prospective loans or leases in a full and timely manner. Testimony presented by the Consumers Union (CU), the Consumer Federation of America (CFA), the National Resources Defense Council (NRDC), Consumer Reports, and others ignored this critical affordability factor, in all likelihood because of their lack of a real-world understanding of how and why consumers actually buy new vehicles at retail. [NHTSA-2010-0131-0267-A1, pp.2-3]

Organization: Ross, D.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 242.]

And most low income consumers finance vehicle purchases so that their net out-of-pocket expense would actually be lower from day one.

Organization: Union of Concerned Scientists (UCS)

(h) Impact on Entry-Level Vehicles

One of the criticisms leveled at the proposed rule in the media over the past few months is that new standards will elevate costs of low-priced vehicles, pricing shoppers for those models out of the market. This is faulty logic for a few reasons. First, increased costs to a given model will not necessarily directly translate to increased price in those models. It is common knowledge that entry-level models are a sought-after market by automakers, as they represent an opportunity to build a long-term customer base through brand allegiance. Automakers seeking to reach that market are likely to keep prices of those models down and use other higher-profit margin vehicles to help defray costs of technology placed on entry-level models. [EPA-HQ-OAR-2010-0799-9567-A2, pp. 13-14]

Even given that fact, however, it is important to note that the cost of technology in this market segment is not untenably high. Take for example, the Hyundai Elantra. The 2010 model, outfitted with stability and traction control but lacking the fuel-saving technologies that subsequently appeared on the 2011 model, achieved a fuel economy of 26/34/29 (city/hwy/comb) at an MSRP of $17,845.38 The comparable 2011 Hyundai Elantra, by contrast – a model outfitted with a host of fuel-saving, emissions reducing technologies such as an efficient 1.8-liter engine and a 6-speed automatic transmission – achieved a fuel economy of 29/40/33 (city/hwy/comb) at an MSRP of $17,195. Thus, the 2011 model (a) offers a 12% reduction in fuel use from the prior model, (b) already meets its GHG target through 2020, and (c) does so at a price reduction of $650. While this is but one example, clearly there is flexibility in the way automakers distribute costs among their model offerings. [EPA-HQ-OAR-2010-0799-9567-A2, p. 14]

Finally, arguments over the initial price of the vehicle ignore the substantial savings purchasers of those vehicles will see due to the improvements under this proposal. These savings will increase consumers' ability to afford vehicles because they can shift money from gasoline expenditures to vehicle expenditures. As noted earlier in our comments, EPA has indicated that such savings will drive an increase in vehicle sales, quite the opposite of pricing consumers out of the market. [EPA-HQ-OAR-2010-0799-9567-A2, p. 14]

UCS urges the agencies to dismiss the argument that the MY2017-2025 standards unfairly penalize shoppers of entry-level vehicles, and to dismiss any proposed modifications to stringency based on that argument. [EPA-HQ-OAR-2010-0799-9713-A1, p. 2]

Response:

These comments raise several related, but somewhat separable issues: the impacts of this rule on vehicle sales; the impacts of this rule on the ability of consumers to buy new vehicles; the impacts of this rule on low-income households; and the impacts of this rule on low-priced vehicles. Section 18.7 of this Response to Comments, along with Preamble III.H.11.a, discuss the impacts of this rule on vehicle sales. Here we focus on the latter three issues. We first note that, in response to these comments, EPA has added a new section, III.H.11.b, to the Preamble, and Chapter 8.1.3 to the RIA, that discuss these issues.

Vehicle Affordability

Comments on the impacts of the rule on the ability of consumers to buy new vehicles discuss the role of costs, fuel savings, and the vehicle loan market. A number of organizations find, as does EPA (see Preamble III.H.5 and RIA Chapter 5.5), that, for those who buy vehicles on credit, the fuel savings exceed the up-front costs from the time of purchase; for those who buy vehicles using cash, the payback period is 3.2-3.4 years (see RIA Chapter 5.5). For those who buy used vehicles, the payback period is expected to be even shorter: the costs of the vehicles (and thus the increased technology costs due to this rule) will go down, but the fuel-saving technologies will maintain their effectiveness. These arguments suggest that the rule will increase the affordability of new vehicles.

In contrast, NADA emphasizes the increase in up-front vehicle costs as a factor in consumers' abilities to purchase. In particular, they state that new vehicle buyers may not be able to get loans for vehicles that have become more expensive as a result of new standards, because they cannot get access to sufficient credit for the additional cost. As a result, they will be unable to participate in the new vehicle market even if the new vehicles offer significant fuel savings. NADA says that auto lenders do not take into account the fuel economy of the vehicles when they are deciding on providing loans; the lenders consider only consumers' debt-to-income ratios. NADA provided an analysis that concludes that up to 6.8 million licensed drivers may no longer have access to new vehicles as a result of the standards. According to NADA's analysis, this estimate is the number of licensed drivers who live in the 3.1 – 4.2 million households that could borrow $11,750, the loan amount for the least expensive new vehicle in 2011 after a $1000 down payment, but could not borrow $14,750.[86] This difference of $3,000 is meant to represent what NADA views as the cost increase of new fuel economy standards, which EPA believes is incorrect and responds to further below.

In assessing these comments, EPA finds that the NADA study does not provide a usable estimate of those consumers in the market for new vehicles who might have trouble getting loans, nor does it provide a usable estimate of the impacts of the rule on the new vehicle market. Because the NADA study does not separate consumers in the market for new vehicles from consumers who are not in the market for new vehicles, the 6.8 million licensed driver figure significantly overestimates any impact of this rule on the new vehicle market. Preamble Section III.H.11.b. includes a detailed response on the key issues raised in the NADA study. The key points from that response include:

- The NADA study is based on the entire population of the U.S., not those who are in the market for vehicles. Its results do not provide useful insights into the effects of the rule on sales of low-priced vehicles, on vehicle sales overall, or on low-income households, because the analysis is not based on households in the market for vehicles. For example, NADA cites 7 million licensed drivers who will not be eligible to get financing for a Dodge Journey. With a total vehicle market estimated to be 17.2 million vehicles in 2025, it is highly unlikely that 7 million people were intending to buy the Dodge Journey but will not do so because of the rule. Sales of the Dodge Journey are unlikely to be as high as 7 million, and even the most negative estimates of vehicle sales impacts from this rule (a loss of 1.8 million vehicles, estimated by the Defour Group; see Section 18.7 of this Response to Comments) do not approach 7 million. We thus find that the NADA study does not provide policy-relevant estimates of rule impacts.
- The NADA estimate of 6.8 million licensed drivers is not the appropriate measure within its own study. In the NADA study, the unit of analysis for affordability is households. Even if there are 6.8 million licensed drivers in those households, they are not independently buying new vehicles; the households can barely afford one, much less multiple, new vehicles. An accurate statement of the findings of the study is that there are 3.1 to 4.2 million households in the U.S. who could theoretically qualify to borrow $11,750 but not $14,750, based purely on having a debt-to-income ratio less than 40 percent.[87]
- NADA's assumption of a $3,000 cost increase per vehicle is based on inappropriately summing the costs of MY 2011, MYs 2012-16, and MYs 2017-25 rules, double-counting MY 2011 costs, and overstating MY 2016 costs. It is also not true that all vehicles will experience the same price increase. See, for instance, RIA Tables 5.1-1, 5.1-6, and 5.1-7 for the variation in costs predicted for different auto companies. It is likely, as discussed in Preamble Section III.H.11.b, that auto makers have discretion to use different profit margins in different vehicle segments; if the auto manufacturers want to preserve access to low-priced vehicles, they are likely to have the ability to do so.

[86] Wagner, D., P. Nusinovich, and E. Plaza-Jennings, National Automobile Dealers Association (February 13, 2012). "The Effect of Proposed MY 2017-2025 Corporate Average Fuel Economy (CAFE) Standards on the New Vehicle Market Population." Docket EPA-HQ-OAR-0799.

[87] As noted, these amounts are based on the cost of the least expensive vehicle in 2011, with $1000 down payment, with the assumption that it will become $3000 more expensive as the result of three rulemakings, for MYs 2011, 2012-16, and 2017-25 (see Wagner et al., footnote 86).

- It is incorrect that no lenders consider the fuel savings of more efficient vehicles in deciding on vehicle loans. As Consumers Union points out and as EPA has found,[88] a number of financial institutions currently provide discounted loans for more efficient vehicles. Indeed, it is possible (though unknown at this time) that the auto loan market may evolve to include further consideration of fuel savings, as those savings play a significant factor in offsetting the increase in up-front costs of vehicles. Thus, the premise underlying NADA's argument is overstated or misplaced.

EPA recognizes that higher vehicle costs will be a disadvantage for vehicle buyers, and that fuel savings will benefit owners of the more fuel-efficient vehicles. Our analysis shows, as does that of a number of commenters, that the fuel savings will considerably outweigh the technology costs and, considering that factor alone, the rule should increase the affordability of new vehicles. See Preamble III.H.5. We recognize that negative impacts on the market for vehicle loans due to these changes are possible, but it is also possible that the loan market may expand its attention to consider fuel savings and thus reduce any negative impacts.

Impact on Low-Income Households

EPA agrees with CFA, CU, and others that low-income households are more likely to buy used vehicles than new vehicles, and appear to be more vulnerable to swings in fuel prices than other households. Because the payback period for used vehicles is shorter than that for new vehicles (see Preamble III.H.5 and RIA Chapter 5.5), it is possible that low-income households may benefit from the rule. As discussed in Preamble III.H.11.a, sales impacts in the market for new vehicles may affect the availability of used vehicles.

The NADA analysis does not distinguish impacts on low-income households from impacts in other sectors and thus does not provide insights into impacts on low-income households.

The Defour Group suggests that the standards are regressive, with adverse impacts falling disproportionately on low-income households, and possibly limiting their ability to obtain employment because of limited mobility. As discussed in Preamble III.H.11.b, the commenter's regressivity assessment is based on an inappropriate application of the cited Jacobsen study.[89] Jacobsen examined the non-footprint-based fuel economy program; the disproportionate impact on low-income households is based on the increased prices of used vehicles and the shift toward smaller vehicles. As discussed above in Section III.H.11.a, EPA finds that the impact on the used vehicle market depends on the impact of the rule on new vehicle sales, which we do not quantify. Because the footprint-based standard sharply reduces incentives to downsize vehicles, we do not accept the conclusion that the rule will result in buyers of used vehicles getting smaller

[88] An internet search on the term "green auto loan" produced more than 50 lending institutions that provide reduced rates for more efficient vehicles. See Helfand, Gloria (2012). "Memorandum: Lending institutions that provide discounts for more fuel-efficient vehicles." Assessment and Standards Division, Office of Transportation and Air Quality, U.S. Environmental Protection Agency, Docket EPA-HQ-OAR-0799.

[89] Jacobsen, Mark. "Evaluating U.S. Fuel Economy Standards In a Model with Producer and Household Heterogeneity." Working paper, University of California, San Diego, September 2010 (Docket EPA-HQ-OAR-2010-0799).

ones, with a consequent welfare loss. For these reasons, the regressivity finding from Jacobsen's paper is not applicable to the effects of this rule.

Impact on Low-Priced Vehicles

The NADA analysis assumes that an average cost increase of $3000 per vehicle applies to vehicles in the low-priced vehicle segment. See above in this section, under "Vehicle Affordability," for our discussion of the cost estimate itself. This segment of the market is of particular interest because it may be the entry class for first-time new vehicle buyers, who may develop brand loyalty and later aim to purchase other new vehicles. NADA argues further that this rule will eliminate from the market vehicles costing $15,000 or less, citing the Energy Information Administration.

As discussed in Preamble III.H.11.b, EPA agrees that some vehicles in the low-priced (economy-class) segment will bear technology costs needed to meet the new standards, but it is not known how manufacturers will decide to pass on these costs across their vehicle fleets, including in the low-priced vehicle segment. As the Union of Concerned Scientists comments, auto makers have some flexibility in which segments will bear more costs, and how those costs will be passed along to consumers in vehicle prices. Because of this flexibility, it is difficult to predict how costs will be translated into vehicle prices. UCS provides the example of the Hyundai Elantra, where the MY 2011 model has higher fuel economy and a lower price than the MY 2010 version, and meets its GHG target through 2020. Though this vehicle may not be considered to be in the lowest-price segment, it demonstrates that added technology does not necessarily translate directly into a higher price.

Moreover, because the standards are established as individual manufacturer fleet average standards, manufacturers can choose the vehicles on which to add controls. It may be, for example, that manufacturers will add fewer controls to smaller, less expensive vehicles, because these vehicles may already be meeting their regulatory targets, because it is more cost effective to add controls to larger less efficient vehicles, to preserve profit margins on lower-margin smaller vehicles, or for a combination of these reasons.

In addition, the average per-vehicle cost increase EPA estimated for the entire industry (both cars and trucks) varies by company. As shown in Table III-25 of the Preamble, while the average MY2025 cost increase for passenger cars across the industry is estimated to be $1,836, EPA estimated that Ferrari's cost would be $7,864/car, Porsche costs would increase by $4,044/vehicle, and Tata-Jaguar-LandRover would increase by $3,390/vehicle. At the same time, several other companies had cost increases for passenger cars lower than the industry average: Toyota at $1,407, Kia at $1,658, and Honda at $1,642/car. Companies such as Ferrari, Porsche, Tata-Jaguar-LandRover, Daimler, and Geely-Volvo, all with estimated costs for passenger cars higher than the industry average, do not sell cars in the lowest price segments of the car market. However, companies such as Toyota, Kia, and Honda do sell to that market, and EPA estimated these companies' cost increases for passenger cars to be lower than the industry average.

The Energy Information Administration's 2011 estimates[90] cited by NADA are based on more stringent standards than those in this rule; are based on cost estimates using a more restricted set of technologies than those examined in this rule (and what appear to be higher costs); and appear to have lower technology phase-in rates than estimated for this rule. Indeed, the timing of the Annual Energy Outlook release is such that even the 2012 AEO analysis of the rulemaking notes that, "due to the timing of the modeling process, [it] does not incorporate all information from the pending rulemaking process, to assess potential energy impacts of the regulatory proposal."[91] We thus do not consider it appropriate to base estimates of vehicle price changes on the 2011 AEO analysis, which uses even less of the data from this rulemaking.

Though the rule is expected to increase the prices of low-price vehicles, the degrees of price increase and the impacts of the price increases, especially when combined with the fuel savings that will accompany these changes, are much less clear. We thus disagree that it is inevitable that vehicles with prices less than $15,000 will disappear from the market.

18.8. Employment Impacts

<u>Organizations Included in this Section</u>

Alliance of Automobile Manufacturers
American Council for an Energy-Efficient Economy (ACEEE)
Anonymous public citizen 4
Axford, H.
Bassett, S.
BlueGreen Alliance
Business for Innovative Climate & Energy Policy (BICEP)
Cafagna, R.
Center for Biological Diversity
Ceres
Consumer Federation of America (CFA)
Cuenca, M.
Defour Group LLC
Detroit NAACP
Ecology Center
Environmental Defense Fund (EDF)
Faria, R.
Feinstein, C.
Ford Motor Company
International Council on Clean Transportation (ICCT)
Investor Network on Climate Risk (INCR) – Ceres

[90] Energy Information Administration. "Increasing light-duty vehicle greenhouse gas and fuel economy standards for model years 2017 to 2025." Annual Energy Outlook 2011, http://www.eia.gov/forecasts/archive/aeo11/pdf/0383(2011).pdf (Docket EPA-HQ-OAR-2010-0799).

[91] Energy Information Administration. "Energy Impacts of Proposed CAFE Standards for Light-Duty Vehicles, model years 2017 to 2025." Annual Energy Outlook 2012, Report Number DOE/EIA-0383(2012). http://www.eia.gov/forecasts/aeo/IF_all.cfm#energyimpact (Docket EPA-HQ-OAR-2010-0799).

Johnson, C.
Lennon, S.
Links, W.
Mass Comment Campaign (39) (Unknown Organization)
Michigan House of Representatives, 49th District
Michigan State Senate, District 18
National Association of Clean Air Agencies (NACAA)
National Wildlife Federation (NWF)
Natural Resources Defense Council (NRDC)
Parker, M.
Paul, M.
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Steffanoff, N.
Stirling, D.
Sullivan, T.
Union of Concerned Scientists (UCS)
United Automobile Workers (UAW)

Organization: Alliance of Automobile Manufacturers

Automakers today are driving this country's economic recovery. Yet, in light of the uncertainty over consumer valuation of fuel savings and other factors, the agencies have not included an estimate of sales or employment impacts in the NPRM or supporting documents. [EPA-HQ-OAR-2010-0799-9487-A1, p.20] [This comment can also be found in section18.7 of this comment summary]

The agencies need to understand and take these impacts into account to assure that the standards being put in place for MY 2022-25 do not reverse the economic gains and environmental benefits that have come from the industry's recent recovery. [EPA-HQ-OAR-2010-0799-9487-A1, p.20] [This comment can also be found in section18.7 of this comment summary]

Organization: American Council for an Energy-Efficient Economy (ACEEE)

Economic Impacts

Benefits of the proposed rule include major macroeconomic benefits in the form of increased jobs and GDP. The primary mechanism for these increases is the shifting of spending from the energy sector to the broader economy, which employs more people per dollar spent, on average. This shift comes about through consumer spending of the money saved on fuel expenditures.1 The attached ACEEE testimony, delivered at the January 24th hearing on the NPRM in San Francisco, provides a summary of this and related issues, as well as a preliminary quantification of the magnitude of these effects. ACEEE is now refining these estimates in conjunction with work with the BlueGreen Alliance and plans to submit this information to the record in the near future. [EPA-HQ-OAR-2010-0799-9528-A2, p.2] [Refer to EPA-HQ-OAR-2010-0799-9528-A1 regarding the ACEEE testimony referenced above.]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 109-111.]

And third, promoting these standards will be good for jobs, even as the fuel economy improvements will save household consumers and businesses money that almost immediately will be respent in the broader economy.

But more importantly, by redirecting the investment in fuel efficiency savings into other sectors of the economy, we support the increased number of jobs. How might that be? Tapping into the evidence, the economic accounts for the U.S. turns out that, directly and indirectly, the total jobs supported by a million dollars of the purchase of gasoline sales supports only 11 jobs per million dollars. But the sale and manufacturing of automobiles, 17 jobs, and in the economy as a whole, 17 to 18 jobs. So anytime we cost-effectively redirect resources away from gasoline purchases into those sectors, we support a net gain of six to seven jobs. Using that logic but in a more sophisticated modeling exercise, we estimate these standards will provide, on average over the period 2017 to 2025, about 300- to 400,000 jobs for the larger economy.

We're going to update those in about a month, but, in effect, the evidence shows that efficiency and improved fuel economy provides more jobs per gallon equivalent.

---

1 - For a discussion of how energy efficiency creates jobs, see also http://aceee.org/blog/2011/11/how-does-energy-efficiency-create-job.

Organization: Anonymous public citizen 4

The added cost being forced on consumers will squeeze middle class Americans. They will no longer be able to contribute to the support of those not working. [EPA-HQ-OAR-2010-0799-10317, p.1]

Realize that most Americans do not have the income to support this proposal. Don't do anything else to us that does not apply to ALL government workers including congress and the president. [EPA-HQ-OAR-2010-0799-10317, p.1]

Organization: Axford, H.

Transportation is critical to our quality of life and EPA’s regulation could increase the cost of a new car up by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-9149-A1, p. 2]

Organization: Bassett, S.

This is just another program to drive up auto prices, thereby eliminating jobs. [EPA-HQ-OAR-2010-0799-8123-A1, p. 1]

Organization: BlueGreen Alliance

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 58-60.]

Consumers looking to purchase vehicles in the next few years are expressing interest in higher fuel economy. Building the next generation of advanced vehicles in the United States will create tens of thousands of new engineering and manufacturing jobs and strengthen America's rebounding sector.

Evidence already exists that bringing cleaner vehicles into the market creates American jobs. We have, by example, the Advanced Technology Vehicle Manufacturing loan program that will preserve or create nearly 40,000 jobs in the U.S. auto sector, retooling America's factories to produce advanced technology vehicles and their key components.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 38.]

Crucially, the proposed standard will help to create many thousands of jobs through net consumer savings on fuel, as well as spending on higher performing vehicles. An initial assessment of the job impact by the University of California Professor David Roland-Holst finds that the proposed standard will create more than 200,000 jobs by the year 2025 in California alone.

Organization: Business for Innovative Climate & Energy Policy (BICEP)

Strong standards will lead to U.S. job growth by creating jobs in the auto industry, and more broadly by diverting consumer spending away from fuel. The July 2011 report "More Jobs Per Gallon: How Strong Fuel Economy/GHG Standards Will Fuel American Jobs;" an economic analysis authored for Ceres by Management Information Services, Inc., found that a 54.5 mpg fuel economy standard3 would create approximately 484,000 economy-wide new U.S. jobs, with 43,000 in the auto industry and net job gains in 49 states in 2030. [EPA-HQ-OAR-2010-0799-9450-A1, p. 1]

Further, under the proposed standard, the report found that in 2030 national gross economic output, or sales, is projected to be $21.3 billion higher; personal income is projected to increase by approximately $14.2 billion, and revenue for cash strapped federal, state and local governments is projected to be approximately $12.7 billion higher in 2030. It is important to note that the higher the standard, the greater the economic benefits;4 thus it is critical that the standards be as strong as possible. [EPA-HQ-OAR-2010-0799-9450-A1, pp. 1-2]

Given its links to so many other sectors of the economy, the health of the auto industry has a significant impact on the economy as a whole. Thus, we find the, recent analysis conducted by Walter McManus of the School of Business Administration at Oakland University, Alan Baum of Baum and Associates, and Dan Meszler of Meszler Engineering Services, in collaboration with Ceres, to be of particular interest. The analysis looked at the impact of the proposed standards (approximately 40 mpg) on the auto industry in 2020. The analysis found that the proposed standards will benefit the auto industry, a major creator of U.S. jobs, and a key player in U.S. manufacturing. In addition, the analysis found that Detroit 3 will see greater benefits than the rest of the industry. Finally, the analysis found that the proposed 2020 standard is cost-effective at a fuel price of $1.50 per gallon. Since this is well below expected fuel prices in 2020, it is clear that the standards will ensure significant savings in fuel costs for consumers, and increase consumer spending in other sectors of the economy. [EPA-HQ-OAR-2010-0799-9450-A1, p. 2]

---

3 Approximately equivalent to the 4% scenario presented in EPA and NHTSA's Joint Notice of Intent, "2017 and Later Model Year Light Duty Vehicle GHG Emissions and CAFE Standards;" EPA 40 CFR Parts 85, 86, and 600; http://edocket.access.gpo.gov/2010/2010-25444.htm

4 For example, the report found that under a 6% improvement scenario, net job gains were projected to be 684,000.

Organization: Cafagna, R.

Transportation is critical to our quality of life and EPA's regulation could increase the cost of a new car up by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. Set the example, ride a burro or bicycle instead of S.U.V. Range Rovers and will follow. Do what I tell you don`t do what I do it does not work. EPA needs to go to China India Korea to see How Much Pollution they produce instead of destroying jobs in the U.S. Solar and wind DO NOT PUSH MY CAR TO WORK. [EPA-HQ-OAR-2010-0799-11689-A1, pp. 1-2]

Organization: Center for Biological Diversity

We also note that the Agencies' initial submission of the rulemaking for review by OMB included additional economic benefits in the form of consumer welfare, increased sales and employment, and increased gross domestic product. These benefits have been deleted from the NPRM without explanation. Absent a rational explanation for this deletion, it must be reversed. [EPA-HQ-OAR-2010-0799-9479-A1, p. 7]

Organization: Ceres

We would like to call your attention to recent analysis conducted by Walter McManus of the School of Business Administration at Oakland University, Alan Baum of Baum and Associates, and Dan Meszler of Meszler Engineering Services, in collaboration with Ceres, on the impact of the proposed standards (approximately 40 mpg) on the auto industry in 2020. The analysis found that the proposed standards will benefit the auto industry, a major creator of U.S. jobs, and a key player in U.S. manufacturing. In addition, the Detroit 3 will see greater benefits than the rest of the industry. [See Docket number EPA-HQ-OAR-2010-0799-9475-A2 for a comprehensive presentation.] [EPA-HQ-OAR-2010-0799-9475-A1, p. 1]

Note that the underlying assumptions for this analysis were conservative; for example it assumed a gas price of $3.50, equal to the average price in 2011, although increased demand from countries such as China, India and Brazil is projected to result in higher prices by 2020. Note also that the analysis found that the proposed 2020 standard would be cost-effective at a fuel price of $1.50 per gallon, well below expected fuel prices in 2020. In fact, a 53 mpg standard would be cost effective at current average gas prices of $3.50 per gallon. [EPA-HQ-OAR-2010-0799-9475-A1, pp. 1-2]

Further, under the proposed standard, the report found that in 2030, national gross economic output, or sales, is projected to be $21.3 billion higher; personal income is projected to increase by approximately $14.2 billion, and revenue for cash strapped federal, state and local governments is projected to be approximately $12.7 billion higher. It is important to note that the higher the standard, the greater the economic benefits; thus it is critical that the standards be as strong as possible. [EPA-HQ-OAR-2010-0799-9475-A1, p. 2]

In addition to increased profits to the auto industry, the proposed standards will also bring job growth by creating jobs in the auto industry, and, more broadly, by diverting consumer spending away from fuel. The July 2011 report “More Jobs Per Gallon: How Strong Fuel Economy/GHG Standards Will Fuel American Jobs;” an economic analysis authored for Ceres by Management Information Services, Inc., found that a 54.5 mpg fuel economy standard would create approximately 484,000 economy-wide new U.S. jobs, with 43,000 in the auto industry and net job gains in 49 states in 2030. [EPA-HQ-OAR-2010-0799-9475-A1, p. 2]

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 74-76.]

Ceres' July 2011 report, 'More Jobs Per Gallon: How Strong Fuel Economy/Greenhouse Gas Standards Will Fuel American Jobs,' found that a 54.5 mpg standard will create about 484,000 economy-wide new U.S. jobs, including 43,000 in the auto industry alone and net job gains in 49 of the 50 U.S. states. National gross economic output would rise by tens of billions of dollars. And it's very important to note that the higher the standard, the greater the economic gain. This is from the report that we put out last summer.

A second report we collaborated on last year with Citi Investment Research, a bank in New York, found that stricter fuel economy standards will bring economic benefits to auto manufacturers, especially the Detroit 3 and their suppliers. The report shows that strong standards will improve the competitive positioning of U.S. automakers and provide the regulatory certainty needed to promote innovation and investment in the industries of the future.

Strong standards will reduce America's and California's dependence on foreign oil, save vast amounts of money for consumers at the gas tank and as well as money for businesses and bolster America's world-class vehicle technology companies, many of them based right here in California.

Organization: Consumer Federation of America (CFA)

Significant macroeconomic benefits of greater fuel economy have been ignored.

- A GDP multiplier must be included that recognizes increases in national output and employment that result from reducing imports and puts more purchasing power in consumer pockets. The estimation of this type of GDP multiplier is a routine practice in policy analysis, and the agencies have calculated its value to be hundreds of billions of dollars but failed to include them in the analysis. [EPA-HQ-OAR-2010-0799-9419-A1, p. 14]

Exhibit S-10 summarizes the key issues that should be addressed, giving a sense of how important they are expressed as a percentage of the total national benefit in the bases case NHTSA-EPA analysis. [See Exhibit S-10 on p. 14 of Docket number EPA-HQ-OAR-2010-0799-9419-A1]

- We believe that the base case analysis underestimates the benefits by at least 20 percent. In dollar terms, that is over $100 billion.
- Since the total cost of adding the fuel economy technologies necessary to meet the standard is only $132 billion and the calculated benefits are in the range of $500 billion, this underestimation of benefits is substantial.
- Inclusion of the GDP multiplier alone could raise the estimated benefits substantially. [EPA-HQ-OAR-2010-0799-9419-A1, p. 14]

The estimates of benefits presented above include the first five factors, but not the last two. Therefore, although our estimates of consumer and national benefits are higher than the agencies, the actual benefits are likely to be even higher. [EPA-HQ-OAR-2010-0799-9419-A1, p. 14]

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 90-91.]

Organization: Cuenca, M.

Transportation is critical to our quality of life and the EPA's regulation could increase the cost of a new vehicle by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-10142-A1, pp. 1-2]

Organization: Defour Group LLC

Our mid-range estimate for industry sales losses is 1.8 million units relative to the baseline, which translates into a loss of 155,000 jobs in manufacturing and supply, plus another 50,000 jobs in distribution for a total job loss of 205,000 jobs in auto manufacturing, supply, and distribution. [EPA-HQ-OAR-2010-0799-9319-A1, p. 9] [This comment can also be found at section 18.7. of this comment summary.]

Organization: Detroit NAACP

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 141.]

Promoting fuel efficiency will create high quality jobs right here in the United States. As said earlier, one of the biggest things they outsourced in the past 20 years has been jobs, and the City of Detroit has felt it more than anybody else, I would say.

Organization: Ecology Center

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 189-190.]

Equally impressive are estimates of job creation and benefits to the manufacturing sector.

According to research commissioned by Ceres more than 500,000 new jobs would be created as a result of the new standards, many of them here in Michigan. Another study on the automotive supply chain for fuel-efficient vehicle technologies found there were already more than 150,000 people employed in the advanced engine, transmission and other electric vehicle supply sectors with over 38,000 of those jobs here in Michigan. Jobs in these automotive supply chains could be expected to nearly double with the implementation of the new proposed standards.

It's important to note that while significant job losses have been sustained in the automotive industry in recent years, investments and new fuel-efficient technologies now provide a strong basis for new manufacturing job growth, providing even greater competitiveness for the U.S. going forward. The proposed standards along with other policies to facilitate research, development, and commercialization of new technologies will help to ensure those job gains continue to be realized here in the region as well as in the U.S. more broadly.

Organization: Environmental Defense Fund (EDF)

H. FINAL RULE SHOULD INCLUDE QUANTITATIVE ESTIMATES OF VEHICLES SALES AND AUTO MANUFACTURING EMPLOYMENT BENEFITS

EPA and NHTSA conducted quantitative vehicle sales and auto manufacturing employment analyses in previous rulemakings and had prepared an estimate of these same indices for the rulemaking action at issue here using the same methodologies. However, the results of these analyses were not included in the published proposal. The changes occurred during the OMB review process. The docket for this rulemaking includes interagency drafts of the proposal submitted to OMB with the quantitative analyses included. The docket also includes the request by OMB to remove the quantitative analyses from the proposal33 and responses from EPA and NHTSA stating the importance of the quantitative analyses and requesting they be left in the final proposal.34 See Attachment B. We incorporate this document as an integral part of EDF's comments for inclusion in the administrative record for this rulemaking action. [EPA-HQ-OAR-2010-0799-9519-A1, p. 14]

We respectfully request that the quantitative vehicle sales and auto manufacturing employment benefits be included in the final rule to fully reflect the comprehensive societal benefits of the proposed program. [EPA-HQ-OAR-2010-0799-9519-A1, p. 14]

[The above comments can also be found in section 18.7 of this comment summary.]

ii. EMPLOYMENT

Additionally, the proposal fails to include the Agencies' results of the quantitative employment analysis, which found that at a 3 percent discount rate, the proposed standards could add more than 65,000 jobs by 2025.36 While the proposal acknowledges, "…this program is expected to affect employment in the regulated sector (auto manufacturing) and other sectors directly affected by the proposal…", the proposal also states, "EPA does not attempt to quantify the net effects of the regulation on overall national employment." (Page 75,156) Again, we recognize the inherent uncertainties in estimating these impacts, but believe the public should have the opportunity to comment on the analysis and request the Agencies include the results of the analysis in the final rule. [EPA-HQ-OAR-2010-0799-9519-A1, p. 15]

Organization: Faria, R.

Transportation is critical to our quality of life and EPA's regulation could increase the cost of a new car up by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-9834-A1, p. 2]

Organization: Feinstein, C.

America's dependence on oil should create jobs here at home. Let's make some jobs first before imposing unreasonable burdens on citizens. [EPA-HQ-OAR-2010-0799-6745-A1, p. 1]

Organization: Ford Motor Company

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 45.]

For example, if a lack of adequate infrastructure hinders the introduction of new fuel-saving technologies or if fuel prices turn out to be substantially lower than anticipated, it might be necessary to change the standards in order to avoid damage to American jobs and the U.S. economy.

Organization: International Council on Clean Transportation (ICCT)

4. The benefits of the proposed rule on consumer welfare and jobs are very large and should be included in the final rule. In particular, the economy-wide benefits from reduced fuel

consumption on GDP, employment, and energy security are large and indisputable. [EPA-HQ-OAR-2010-0799-9512-A1, p. 3]

4) Sales, Employment and GDP

As proposed, the 2017-2025 standards will have major economic benefits. Analyses conducted for the initial submission for interagency review, but not included in the NPRM, concluded that:

• New vehicle sales will increase by more than 300,000 vehicles by 2025

• Net employment will increase by between 1,800 and 4,500 jobs in 2017 and between 22,300 and 56,100 jobs in 2025

• US GDP will increase by 0.26% in 2020 and by 0.88% in 2030 [EPA-HQ-OAR-2010-0799-9512-A1, p. 13]

As discussed above, the cost to comply with the proposed requirements is likely to be substantially less than estimated by EPA and NHTSA. The fuel savings will pay for the cost of the technology many times over, effectively putting billions of dollars into consumers' pockets to buy other products. This will raise the standard of living, increase GDP and create economy-wide jobs. [EPA-HQ-OAR-2010-0799-9512-A1, p. 13]

Given these huge and obvious benefits, it is essential that the rule assess the beneficial impacts of the rule on sales, jobs, and GDP. The initial submission for interagency review contains these analyses, but they were not included in the final rule proposal. [EPA-HQ-OAR-2010-0799-9512-A1, pp. 13-14]

These sales impact results are also required as input to other economic impact analyses, such as employment and GDP. As a result of the lack of new vehicle sales impact data, the employment impacts due to changes in the demand of new vehicles was not estimated in the proposed rule. The initial submission for interagency review also conducted a careful analysis of associated increases in employment.13 The method for calculating employment effects included the demand effect, or the labor required to build more vehicles; the cost effect, which represents the labor required for new technologies manufacturing; and the factor shift effect, which looks at labor intensity changes due to changes in technology. The effect on employment was originally estimated to add between 1800 and 4500 jobs in 2017 and to add between 22300 and 56100 jobs in 2025.14 ICCT supports these analyses and believes they are appropriate and should be included in the final rule. [EPA-HQ-OAR-2010-0799-9512-A1, p. 14]

Most importantly, the effect of the rule on GDP was also not included in the proposed rule. The initial submission for interagency review used computable general equilibrium (CGE) modeling to evaluate the effects of this rule on consumer expenditure and predicted that the US GDP would increase over time as a result of the increase in consumer expenditure (by 0.26% in 2020 and by 0.88% in 2030),15 This is an appropriate methodology and clearly shows that, due to fuel savings, consumer expenditure and consumer demand would increase, with substantial economy-wide benefits on GDP and employment. [EPA-HQ-OAR-2010-0799-9512-A1, p. 14]

ICCT has reviewed the methodology EPA used for estimating the impact on vehicle sales in the initial submission for interagency review. We find that it is consistent with the approach in the 2012-16 light-duty GHG and CAFE rule, and in several previous CAFE rulemakings by NHTSA. The method balances the changes in demand due to vehicle price increase and the economic benefits of fuel economy using a 5-year payback period, and found an increase in new vehicle sales of more than 300,000 vehicles by 2025 due to the fuel savings benefit,12 [EPA-HQ-OAR-2010-0799-9512-A1, p. 14]

The agencies state that the reason they do not include sales impact estimates is that there is no good analytical basis to make this calculation: [EPA-HQ-OAR-2010-0799-9512-A1, p. 14]

USEPA: 'The empirical literature does not provide clear evidence on whether consumers fully consider the value of fuel savings at the time of purchase. It also generally does not speak to the efficiency of manufacturing and dealer pricing decisions. Thus, for the proposal we do not provide quantified estimates of potential sales impacts. Rather, we solicit comment on the issues raised here and on methods for estimating the effect of this rule on vehicle sales.' [EPA-HQ-OAR-2010-0799-9512-A1, pp. 14-15]

NHTSA: *'As* discussed below, for this analysis we have conducted a fresh search of the literature for additional estimates of consumer valuation of fuel savings, in order to determine whether the 5 year assumption was accurate or whether it should be revised. That search has led us to the conclusion for this proposed rule that consumer valuation of future fuel savings is highly uncertain. A negative impact on sales is certainly possible, because the proposed rule will lead to an increase in the initial price of vehicles. A positive impact is also possible, because the proposed rule will lead to a significant decrease in the lifetime cost of vehicles, and with consumer learning over time, this effect may produce an increase in sales. In light of the relevant uncertainties, the agency therefore decided not to include a quantitative sales estimate and requests comments on all of the discussion here, including the question whether a quantitative estimate (or range) is possible. [EPA-HQ-OAR-2010-0799-9512-A1, p. 15]

ICCT is not in agreement with the agencies assertion that the analytical basis for sales, employment, and GDP analyses is inadequate. While there are large uncertainties in how customers behave, such analyses are widely used in other contexts (e.g. the CARB analysis of the LEV III GHG rule uses CGE modeling and includes employment and GDP impacts) and are appropriate here as well. Further, the uncertainty in consumer behavior does not change the fact that the fuel savings will pay for the cost of the technology many times over. [EPA-HQ-OAR-2010-0799-9512-A1, p. 15]

The ICCT strongly supports adding consumer welfare analyses back into the final rule, as they provide relevant and important information regarding employment and GDP. In particular, the economy-wide benefits from reduced fuel consumption are large and indisputable. [EPA-HQ-OAR-2010-0799-9512-A1, p. 17]

While the ICCT believes it is clear that the standards will have a positive impact on vehicle sales and direct vehicle-related employment, we do acknowledge that there is substantial uncertainty in how consumers will react to the higher vehicle prices, new technology, and lower fuel payments. It is possible that the direct sales and employment benefits might be small. However, it is inexcusable to ignore the economy-wide benefits from the large reduction in vehicle fuel consumption. No matter how customers react, the fuel savings will pay for the cost of the technology many times over. This will give customers billions of dollars to buy other products, raising their standard of living, increasing GDP, and creating economy-wide jobs.20 [EPA-HQ-OAR-2010-0799-9512-A1, p. 17]

There will be further economy-wide and energy security benefits from reducing oil imports and helping our balance of trade. These economy-wide benefits are certain and their exclusion from the proposed rule is inappropriate. [EPA-HQ-OAR-2010-0799-9512-A1, p. 17]

---

12 Summary of interagency working comments received on draft rule under EO 12866 review. Pages 439-443.

13 Docket item EPA-HQ-OAR-2010-0799-1224, pages 454-455

14 Summary of interagency working comments received on draft rule under EO 12866 review. Table III-88, page 458

15 Docket item EPA-HQ-OAR-2010-0799-1224, pages 460-461

20 See, for example, the Nextl 0 study at http://nextlO.org/nextlO jpublicationsjvehicle_efficiency.html.

Organization: Investor Network on Climate Risk (INCR) - Ceres

Strong standards will lead to job growth by creating jobs in the auto industry, and more broadly by diverting consumer spending away from fuel. The July 2011 report “More Jobs Per Gallon: How Strong Fuel Economy/GHG Standards Will Fuel American Jobs;”3 an economic analysis authored for Ceres by Management Information Services, Inc., found that a 54.5 mpg fuel economy standard would create approximately 484,000 economy-wide new U.S. jobs, with 43,000 in the auto industry and net job gains in 49 states. [EPA-HQ-OAR-2010-0799-9516-A1, p. 1]

Further, under the proposed standard, the report found that national gross economic output, or sales, is projected to be $21.3 billion higher; personal income is projected to increase by approximately $14.2 billion, and revenue for cash strapped federal, state and local governments is projected to be approximately $12.7 billion higher. It is important to note that the higher the standard, the greater the economic benefits;4 thus it is critical that the standards be as strong as possible. [EPA-HQ-OAR-2010-0799-9516-A1, pp. 1-2]

Independent analysis also indicates that stronger standards will benefit the auto industry, a major creator of U.S. jobs, and a key player in U.S. manufacturing. Earlier this year, Ceres partnered with Citi Investment Research to produce “Fuel Economy Focus: Perspectives on 2020 (Auto)

Industry Implications," which found that strict fuel economy standards would bring economic benefits to auto manufacturers, particularly the Detroit 3, and their suppliers. Strong standards will improve the competitive positioning of U.S. automakers, and provide the regulatory certainty needed to promote innovation and investment in the industries of the future, such as clean tech and high tech sectors. [EPA-HQ-OAR-2010-0799-9516-A1, p. 2]

---

3 Approximately equivalent to the 4% scenario presented in EPA and NHTSA's Joint Notice of Intent, "2017 and Later Model Year Light Duty Vehicle GHG Emissions and CAFE Standards;" EPA 40 CFR Parts 85, 86, and 600; http://edocket.access.gpo.gov/2010/2010-25444.htm

4 For example, the report found that under a 6% improvement scenario, net job gains were projected to be 684,000.

Organization: Johnson, C.

Passing ARBITRARY rules hurts the economy and hurts my employment. [EPA-HQ-OAR-2010-0799-6528-A1, p. 1]

Organization: Lennon, S.

Transportation is critical to our quality of life and EPA's regulation could increase the cost of a new car up by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-9019-A1, p. 1]

Organization: Links, W.

Transportation is critical to our quality of life and EPA's regulation could increase the cost of a new car up by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-10348-A1, p. 2]

Organization: Mass Comment Campaign (39) (Unknown Organization)

These rules will lead to substantial savings for American families. They will keep more money in American communities, and the economic multiplier will be a boon for the economy. [EPA-HQ-OAR-2010-0799-1245-A1_MASS, p.1]

Finally, I strongly support the new technologies and innovations that will come from the standards set fourth in this proposal, and the resulting high quality jobs that will be necessary to create them. The new standards give automakers clear, long-term direction, and will help American car companies compete in an increasingly efficient global market. [EPA-HQ-OAR-2010-0799-1245-A1_MASS, p.1]

I look forward to the improvements in public health, economy, environment, and national security that will result from these proposed CAFE standards. [EPA-HQ-OAR-2010-0799-1245-A1_MASS, p.1]

Organization: Representative from Michigan House of Representatives, 49th District

The standards will help create and retain the good paying automotive jobs essential to the prosperity of states like Michigan and communities like Genesee County. A recent report by the United Auto Workers (UAW), National Wildlife Federation (NWF), and Natural Resources Defense Council (NRDC) found that Michigan employs the most at over 38,000 workers at 97 facilities in the manufacture of fuel-efficient parts of the automotive supply chain. That's not news to Flint: local auto suppliers employ hundreds of workers and substantially contribute to our region's economy. [EPA-HQ-OAR-2010-0799-7983-A1, p. 1]

Organization: Senator from Michigan State Senate, District 18

Finally, increased fuel economy standards will continue to create jobs: good paying jobs that employ Michigan workers. A recent report by the Natural Resources Defense Council (NRDC), National Wildlife Federation (NWF), and United Auto Workers (UAW) found that the auto industry currently employs over 151,168 autoworkers at 504 facilities building cars with clean, efficient technology-and 38,067 of those jobs are in 97 facilities right here in Michigan. It might not surprise you to learn that Michigan has more autoworkers employed in building clean, efficient cars, than any other state in the nation. [EPA-HQ-OAR-2010-0799-5594-A1, p. 1]

If you want proof, you do not have to go far to see how we are benefitting from the production of this new technology. As we speak, the battery pack for the Chevy Volt is being produced in Brownstown, and the vehicle is being built in Detroit. In my own district, Ford's hybrid electric vehicle battery pack assembly is coming to the Rawsonville plant, a facility that was once slated to close, and the vehicles will be fully constructed at the Michigan Assembly Plant in Wayne. That is work that is being brought back from Mexico. [EPA-HQ-OAR-2010-0799-5594-A1, pp. 1-2]

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 34.]

Economic growth and the creation of high-quality jobs across the country due to the need for innovative automotive technologies upon which the standards rely;

Organization: National Wildlife Federation (NWF)

Fuel economy standards are working now to build jobs.

This past summer NWF, with the UAW and NRDC, released Supplying Ingenuity a report that found 150,000 workers in 43 states employed today in more than 300 companies that make technology that specifically contribute to increasing fuel economy. These jobs were spread widely across traditional vehicles and components, materials, electronics, hybrids and batteries and electric technology. 10 [Figure 3 can be found on p. 6 of Docket number EPA-HQ-OAR-2010-0799-9887-A2] [EPA-HQ-OAR-2010-0799-9887-A2, pp. 6-7]

This study follows a 2010 study, Driving Growth that found that incremental net content added to vehicles to achieve higher fuel economy means more manufacturing jobs. The study predicted that achieving 40mpg by 2020 would add up to 150,000 manufacturing jobs in the US. 11 [EPA-HQ-OAR-2010-0799-9887-A2, p. 7]

Also in 2011, More Jobs Per Gallon a report by Management Information Systems for Ceres found that new 2017-2025 standards would add nearly 500,000 jobs once the economy wide impacts of consumer and business net savings on fuel were taken into account. The study found that stronger 2017-2025 fuel economy standards would also increase gross economic output, personal income and tax revenues. 12 [EPA-HQ-OAR-2010-0799-9887-A2, p. 7]

Testing these studies against reality, Bureau of Labor Statistics data shows the auto sector added 100,000 direct jobs building and selling the next generation of clean cars and trucks in 2011 alone.

[This comment was also submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 32.]

These direct jobs anchor hundreds of thousands of additional jobs throughout American communities. 13 [EPA-HQ-OAR-2010-0799-9887-A2, p. 7]

These manufacturing and technical jobs are critical today in an industry and in communities which have seen deep job losses over the past decade, and to bolstering the overall strength of the economy today and in decades to come. The standards help ensure the US auto manufacturing captures its full share of today's competitive global auto market, and that Americans are able to increasingly spend their money building jobs in their communities at instead of leaving household and national budgets at the mercy of rising, volatile, global oil prices. [EPA-HQ-OAR-2010-0799-9887-A2, p. 7]

These results show why it matters for America to lead in the clean energy economy. The standards the agencies have proposed are essential to sustaining that progress. [EPA-HQ-OAR-2010-0799-9887-A2, p. 7]

10 http://www.nrdc.org/transportation/autosuppliers/

11 http://www.nrdc.org/energy/files/drivinggrowth.pdf

12 http://www.ceres.org/resources/reports/more-jobs-per-gallon

13 http://www.bls.gov/iag/tgs/iagauto.htm

Organization: Natural Resources Defense Council (NRDC)

EPA and NHTSA should dramatically improve the employment and economic impact analysis by accounting for sales impacts using the methodology consistent with previous rules, creating an alternative non-full employment scenario, and fully accounting for economy-wide impacts. [EPA-HQ-OAR-2010-0799-9472-A2, p. 4]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 199.]

Making better vehicles means more U.S. jobs. A recent report from the investor group Ceres estimates that the auto industry investments and consumer savings triggered by the proposed standards would generate 484,000 jobs across the country. This is not surprising.

NRC recently partnered with the UAW and the National Wildlife Federation to quantify the jobs being spurred by the current 2012 to 2016 standards. In our joint report, 'Supplying Ingenuity,' we found that over 150,000 workers are currently employed in 300 automotive supply companies across 43 states to make parts that enable cars and trucks to cut pollution and go further on a gallon of gas.

Organization: Parker, M.

Transportation is critical to our quality of life and EPA's regulation could increase the cost of a new car up by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-9017-A1, p. 2]

Organization: Paul, M.

Transportation is critical to our quality of life and the EPA's CAFE mandates could... INCREASE THE COST OF A NEW CAR BY $6,000 according to the Center for Automotive Research AND... $5,000 according to the National Automobile Dealers Association. [EPA-HQ-OAR-2010-0799-9027-A1, p. 2]

EITHER OF THESE PRICE INCREASES WOULD LEAD TO A REDUCTION OF TENS OF THOUSANDS OR SORELY NEEDED JOBS due to people not being able to afford these more expensive cars. Thus... the car companies will not have to produce as many cars, and as a consequence, will employ fewer workers to produce fewer cars. [EPA-HQ-OAR-2010-0799-9027-A1, p. 2]

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air

Council

Increasing sales and creating jobs: Increased vehicle sales and advanced vehicle technologies will create jobs in the automotive manufacturing sector. In their initial submission to OMB, the agencies estimated that between 22,300-56,100 jobs would be created in the vehicle manufacturing sector as a result of these standards.14 Outside groups have reached similar conclusions that these standards will create jobs. A study by the investor network, Ceres, found that the proposed standards would create 43,000 jobs in the automotive industry and 484,000 jobs economy-wide. The agencies' jobs and sales analyses, as proposed in the initial submission to OMB, should stand in the final rule. [EPA-HQ-OAR-2010-0799-9549-A2, p. 4]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 123.]

The report from Ceres estimates that nearly half a million jobs may be added to the economy between jobs and the auto industry.

---

14 EO12866 Review-Interagency Review material Part 1- 2017-2025 Vehicle GHG and Fuel Economy Standard and NPRM 2060 AQ54, Document ID: EPA-HQ-OAR-2010-0799-1224, pg. 907 of PDF [EPA-HQ-OAR-2010-0799-9549-A2, p. 4]

Organization: Steffanoff, N.

Transportation is critical to our quality of life and EPA's regulation could increase the cost of a new car up by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs. [EPA-HQ-OAR-2010-0799-9335-A1, p. 2]

Organization: Stirling, D.

How many jobs will this cost? I am not in favor of the the government adding additional new standards when I cannot be employed as an engineer with thirty five years of experience designing computer equipment. [EPA-HQ-OAR-2010-0799-10065-A1, p. 1]

Organization: Sullivan, T.

Transportation is critical to our quality of life. EPA's regulation could increase the cost of a new car up by $6,000 according to the Center for Automotive Research and $5,000 according to the National Automobile Dealers Association. This price increase would lead to a reduction of tens of thousands of jobs (at least). [EPA-HQ-OAR-2010-0799-10341-A1, p. 2]

Organization: Union of Concerned Scientists (UCS)

The standards also deliver important economy-wide benefits. By spending less on oil, consumers have more income to spend on other goods and services. This has a direct effect on both national gross domestic product and U.S. employment. A recent report from Ceres found that standards similar to those proposed by the agencies would create nearly 500,000 new jobs nationwide in 2030. The report also found that gross economic activity would increase more than $21 billion in 2030.3 [EPA-HQ-OAR-2010-0799-9567-A2, p. 2]

Strong standards that save drivers money can also support robust employment. Increasing standards will promote new vehicle technologies and increase investment in the auto industry, generating new jobs throughout that sector. The savings consumers realize at the pump will also shift consumer purchases away from the petroleum and wholesale industries to other parts of the economy that generate more jobs for every dollar spent. [EPA-HQ-OAR-2010-0799-9713-A1, p. 2]

The agencies' own analysis of the proposed standards showed similar positive economic benefits to the U.S. economy. Specifically, EPA found that the proposed standards would increase U.S. Gross Domestic Product (GDP) by over $100 billion in 2025 (a 0.48% increase) and over $400 (a 1.31% increase) in 2040. [EPA-HQ-OAR-2010-0799-9567-A2, p. 2]

These standards will not only deliver positive benefits to the American economy, they will also benefit the domestic auto industry and its workers. Investing in fuel-saving and pollution reduction technology will increase value throughout the supply chain, creating new jobs. A recent report found that there are already over 151,000 people employed in the United States building fuel efficient vehicles and components.5 Under the proposed standards, analysis by Ceres projected that the automotive industry would gain an additional 43,000 jobs in 2030.6 EPA also projects an increase in employment of 23,400-56,100 new jobs in the automotive sector as a result of these standards.7 [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

In addition to job creation and increased sales, better fuel efficiency and greenhouse gas performance will improve the competitiveness of the American auto industry. Unlike in 2008, when American automakers faced severe financial hardship as a result of rising oil prices, these standards will ensure that manufacturers continue to innovate over the coming decade resulting in a product line that is both fuel efficient and at the forefront of automotive technology. Across the world, consumers and government standards are demanding greater fuel efficiency and lower emissions. These standards will help ensure that American automakers remain globally competitive. A recent report by Citigroup and Ceres found that a fuel economy standard of 42 mile-per-gallon by 2020 (more stringent than the proposed standards) would increase the profitability and competitiveness of American automakers.10 [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

As shown above, the literature and the agencies' own analyses demonstrate that the proposed standards will deliver important benefits to consumers, the U.S. economy, automakers, and American autoworkers. While the agency's economic analysis is discussed in the interagency review documents, it is surprising that this data on increased vehicle sales, GDP, and employment were not included in the proposed rule. UCS strongly encourages the agencies to include these figures in the final rule in order to educate the public on the positive economic benefits of strong fuel efficiency and greenhouse gas standards. [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

As has been stated in prior comments, UCS objects to the agencies' underestimation of long-term fuel price projections. In this proposed rule, the agencies again rely on the Energy Information Administration's (EIA) Annual Energy Outlook for long-term fuel price projections. We elaborate more on gasoline price projections in Section II(g) below, and thus will only remark here that EIA's core projections have consistently underestimated future fuel prices. Moreover, EIA projects only very modest, steady changes in fuel prices, without any significant volatility. Oil and gasoline price spikes have occurred about twice each decade for the last 30 years and almost every one was followed by a U.S. recession.25 Given these facts, the agencies should include such price spikes in their projections. At a minimum, UCS encourages the agencies to continually evaluate projections for future fuel prices and include sensitivity analysis demonstrating potential cost-effectiveness at higher stringency levels under more realistic fuel price scenarios. [EPA-HQ-OAR-2010-0799-9567-A2, p. 6]

By undervaluing the energy security costs and fuel-savings, the agencies are not fully evaluating the potential cost-effectiveness of more stringent standards. If the agencies properly valued the full set of societal costs and benefits, a more stringent standard of 143 g/mi and approximately 60 miles-per-gallon in MY 2025 would deliver greater net societal benefits. [EPA-HQ-OAR-2010-0799-9567-A2, p. 6]

---

3 Ceres. More Jobs Per Gallon. Management Information Services, Inc. July, 2011. http://www.ceres.org/resources/reports/more-jobs-per-gallon/view [EPA-HQ-OAR-2010-0799-9567-A2, p. 2]

5 United Auto Workers, Natural Resources Defense Council, and National Wildlife Federation. Supplying Ingenuity U.S. Suppliers of Clean, Fuel-Efficient Vehicle Technologies. August, 2011. [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

6 Ceres. More Jobs Per Gallon. Management Information Services, Inc. July, 2011. http://www.ceres.org/resources/reports/more-jobs-per-gallon/view [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

7 Interagency review document, EPA-HQ-OAR-20100799-1224, Joint Rulemaking to Establish 2017 and Later Model Year Light Duty Vehicle GHG Emissions and CAFE Standards, p., p. 907 [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

10 Citigroup & Ceres. Fuel Economy Focus: Perspectives on 2020 Industry Implications. March 2011. http://www.ceres.org/resources/reports/fuel-economy-focus [EPA-HQ-OAR-2010-0799-9567-A2, p. 3]

25 http://www1.eere.energy.gov/vehiclesandfuels/facts/2009_fotw579.html [EPA-HQ-OAR-2010-0799-9567-A2, p. 6]

Organization: United Automobile Workers (UAW)

The UAW believes strongly that the proposed rules will strengthen the overall economy and the domestic auto industry. The economy will benefit because consumers will spend less on fuel for vehicles and more on other goods and services. [EPA-HQ-OAR-2010-0799-9563-A2, p.1]

This proposal will lead to significant net job creation. [EPA-HQ-OAR-2010-0799-9563-A2, p.1]

Increasing the efficiency of light-duty vehicles leads directly to the creation of jobs in the auto industry because the technology needed to increase efficiency represents incremental net content on each vehicle, and that additional content must be engineered and produced by additional employees. [EPA-HQ-OAR-2010-0799-9563-A2, p.1]

Employment Effects [EPA-HQ-OAR-2010-0799-9563-A2, p.4]

The UAW represents about 150,000 members in the light-duty vehicle assembly and parts sectors, so understanding the effects of significant rulemaking in the automobile industry is important to the UAW and its members. The UAW has taken an active role in efforts to identify and quantify how the drive to improve the efficiency of automobiles affects employment in the domestic auto industry. [EPA-HQ-OAR-2010-0799-9563-A2, p.4]

The UAW believes very strongly that because improving the efficiency of light-duty vehicles requires additional content on each vehicle, and that additional content requires more engineers and production workers, developing and producing cleaner cars increases employment in the auto industry. [EPA-HQ-OAR-2010-0799-9563-A2, p.5]

In 2010, the UAW, along with the Natural Resources Defense Council (NRDC) and the Center for American Progress, published a report titled “Driving Growth” that used the net cost of equipment added to increase vehicle efficiency to estimate how many jobs could be created by the addition of enough fuel-saving technology for the new vehicle fleet to reach 40 miles per gallon by 2020. [EPA-HQ-OAR-2010-0799-9563-A2, p.5]

The study found that the additional content needed to reach 40 miles per gallon would create 190,000 jobs of all types somewhere in the world. The number of jobs this would create in the United States is dependent on how much of the additional content is produced domestically. The results estimate that if 75% of the additional content were produced in the United States, as many as 150,000 jobs would be created. The study is attached to these comments. [EPA-HQ-OAR-2010-0799-9563-A2, p.5]

In 2011, the UAW, NRDC and the National Wildlife Foundation published a report titled “Supplying Ingenuity,” which was meant to identify the wide variety of jobs and locations associated with clean car technology. The report identified 504 facilities across 43 states employing over 500,000 people where some or all of the work is researching, developing or producing clean-car technologies. One significant finding is that fully 67% of these jobs are related to advanced conventional technologies such as better engines and transmissions and components like electric power steering and high-strength steel. The "Supplying Ingenuity" report is also attached to these comments. [EPA-HQ-OAR-2010-0799-9563-A2, p.5]

Because of the UAW's interest in seeing improved fuel economy and reduced tailpipe pollution bolster the domestic auto industry, we were particularly pleased that in President Obama's 2010 memo directing the agencies to develop rules extending beyond 2016, he also directed that the proposed program "…should strengthen the industry and enhance job creation in the United States." [EPA-HQ-OAR-2010-0799-9563-A2, p.5]

Accordingly, EPA made an effort to estimate the employment effects of the proposed regulation in order to demonstrate the proposal was constructed so that its effect would meet the conditions set forth in President Obama's memo. The UAW commends the EPA for its extensive consideration and extended discussion of the issues associated with estimating the employment effects of the proposed rule. [EPA-HQ-OAR-2010-0799-9563-A2, p.5]

Although the EPA was unable to complete and publish estimates of several important ways that the rule could affect employment, the UAW applauds EPA's findings that the additional content on each vehicle needed to reduce tailpipe emissions does indeed result in increased employment in the auto industry and the intermediate and basic industries that supply the auto industry. By estimating broad employment effects in the auto industry using data on the number of employees per million dollars of expenditure, EPA has outlined a useful approach for understanding how cleaner cars can create jobs. The UAW is also encouraged by the EPA's recognition that the import share of additional production must be taken into consideration when estimating these domestic employment effects. [EPA-HQ-OAR-2010-0799-9563-A2, pp.5-6]

The UAW also believes that in the Draft Regulatory Impact Analysis (DRIA) that accompanies the proposed rules, the EPA has provided excellent and useful examples of how to assess the change in labor demand for several of the fuel-saving technology packages that are projected to be widely applied during the 2017 – 2025 period. This methodology centers on tear-down studies of fuel-saving technology packages by EPA's engineering consultant that accounts for the net incremental content in that specific package. [EPA-HQ-OAR-2010-0799-9563-A2, p.6]

The results, as summarized in table 8.2-3 of the DRIA, show that in each of the six technologies evaluated, additional labor is required to produce the technology. In the case of switching from a six-speed to an eight-speed transmission, an additional .33 hours of labor are required for each unit. This result suggests that one full-time job will be created for each increment of about 4,500 eight speed transmissions when upgrading from a six-speed. [EPA-HQ-OAR-2010-0799-9563-A2, p.6]

In the example of a downsized, turbocharged gas direct injection V-6 that replaces a V-8 engine, similar to the EcoBoost engine offered by Ford in its full-size pick-up trucks, the additional labor requirement is estimated at 1.82 hours per unit. This implies that a full-time position is created for each increment of about 825 such engines. [EPA-HQ-OAR-2010-0799-9563-A2, p.6]

More complicated technology packages with greatly increased content require even more labor. A full hybrid with a power-split design is estimated to require an additional 8.54 hours of labor, which implies an additional full-time employee for each 175 units produced. [EPA-HQ-OAR-2010-0799-9563-A2, p.6]

However, because EPA was unable to evaluate the additional labor requirement for all the technologies that were considered in the technical analysis, EPA was not able to give a complete estimate of the potential employment effects using this excellent methodology. The UAW urges EPA to continue this work in its ongoing evaluation of the cost and effectiveness of fuel-saving technologies. [EPA-HQ-OAR-2010-0799-9563-A2, p.6]

EPA was also unable to quantify the employment effects of any potential change in sales resulting from the increase in the price of vehicles accounted for by the additional content. This is a tortured subject, studied repeatedly with conflicting results across studies at even the basic level of whether the effect is positive or negative. The UAW recognizes EPA’s effort to discuss and sort through the issues involved with estimating change in sales due to the regulation of tailpipe emissions. [EPA-HQ-OAR-2010-0799-9563-A2, p.6]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 22-25.]

Adopting the proposed rules will give an additional boost to the revitalization of the auto industry that began with President Obama's courageous action in the depths of the industry's crisis to save American manufacturing jobs by giving GM and Chrysler the breathing room they needed to restructure.

After a painful process in which workers and retirees made significant sacrifices, the industry is coming back strong. Our units with collective bargaining agreements with Ford, General Motors and Chrysler include substantial investments by all three companies, in some cases bringing back work from overseas.

The 20,000 UAW-represented hourly jobs that will be protected and added over the next four years will have a substantial and positive ripple effect throughout the supply chain as well as the local communities.

One important reason we are so confident that the industry's future -- in the industry's future is that we are excited about the new green technologies that are being developed in the United States and produced in UAW-represented facilities. The drive to bringing innovative fuel-saving technologies to market is transforming the auto industry in the United States in creating good jobs in the research labs to the factory floor. General Motors, Ford and Chrysler have made unprecedented commitments to invest billions of dollars in their U.S. operations over the next few years and in every case the investment of supporting new vehicles and powertrains that will be more efficient than the previous generation.

There's a common element in all of these technologies. They are all now or will soon be produced by UAW members and factories located in the United States, and that's just the beginning.

Although most auto makers will continue to meet fuel efficiency and tailpipe emissions through improvements in conventional vehicles, we are excited that these new transforming technologies are being produced by UAW members. These are the automotive jobs of the future. We are very pleased that they are starting to ramp up here in the United States.

Thanks to the fresh start President Obama gave to the domestic auto industry, new labor agreements that are the result of innovative, problem-solving approach in bargaining and the strong transparent working relationships we have with UAW employers, the U.S. auto industry is growing and adding employees. These proposed rules are the cornerstone of that growth. It provides certainty as manufacturers map out their product investment plans.

I want to underscore why we believe the drive to increase fuel efficiency and reduce tailpipe pollution is creating jobs in the U.S. auto industry.

A second, more fundamental reason is because the technology needed to improve efficiency and reduce pollution represents additional content on each vehicle. That additional content must be engineered and produced by additional employees.

Last year the UAW and the Natural Resources Defense Council and Larry's organization, The National Wildlife Federation, produced a report called Supplying Ingenuity. That report identifies more than 500 separate facilities in the United States, employing over 150,000 people, where some or all the employees are working to invent, engineer, or produce advanced vehicles and fuel- savings components. These are real jobs supporting real American families.

Response:

Several commenters specifically requested inclusion of employment impacts in the analysis for this rule. EPA discusses employment impacts in Preamble Section III.H.12 and RIA Chapter 8.2. We include a detailed discussion of the expected impacts of this rule on employment, and on methods for measuring employment impacts. We also present a partial quantification of the impacts of this rule on employment in the auto sector, in our estimates of the effects on employment due to developing and using the technologies expected to be used for compliance with the standards (the "cost effect"). Our discussion explains that we do not provide fuller quantification for several reasons. First, we do not quantify the impacts of the rule on auto sector employment due to changes in vehicle sales (the "demand effect") or due to the labor intensity of vehicle production (the "factor shift effect"), other pathways for employment impacts, due to insufficient data to support that analysis. Second, the impacts of the rule on national employment depend heavily on the state of the macroeconomy at the time of implementation, which begins in MY 2017. If the economy is at or close to full employment, the primary effect of the rule on employment will be to shift employment among sectors, rather than to create or reduce job availability. On the other hand, if there is substantial involuntary unemployment at the time of implementation, the rule may affect aggregate employment levels. Difficulties in estimating unemployment rates in the future imply that the impacts of the rule on employment in the wider economy will be highly uncertain. We offer the detailed discussion of these issues as the explanation for our decision to quantify some but not all employment impacts of the rule. We appreciate the support from the UAW of our identification of these multiple effects, our identification of domestic versus foreign impacts, and our discussion of these complexities. We did not receive comments identifying problems with our analysis.

A major conclusion from this review is that increasing standards does not inevitably cause losses in employment, either in the auto sector or in the economy as a whole. Because employment impacts in the auto industry result from expenditures on new technologies as well as effects on vehicle sales, it is possible that employment may increase; the analysis in Preamble section III.H.12 and RIA Chapter 8.2 in fact show increases. Employment impacts in the rest of the economy may be positive in some sectors (such as suppliers of materials for auto parts) and negative in others (such as gasoline production), as further discussed in those sections.

Comments from the Defour Group estimating employment losses of about 200,000 from the rule analyze impacts in the auto and distribution sector due only to the demand effect; they do not consider impacts due to the cost or the factor-shift effects. As discussed in Section 18.7 of this Response to Comments, the negative vehicle sales estimates from the Defour Group are based on cost estimates substantially higher, and a smaller role for fuel savings, than those found in this rule. TSD Chapter 3.1.2.2 discusses the Defour Group/NADA cost estimates – in particular, the higher indirect cost estimates; Section 18.2.1 of this Response to Comments discusses those cost estimates as well as those from the Center for Automotive Research mentioned by several individuals. The omission in its study of cost-effect employment impacts leaves out a potentially significant source of employment gains. Impacts due to the factor-shift effect may increase or decrease employment. Because the Defour Group uses costs significantly higher than those we have estimated, and because they do not consider some of the channels through which employment in the auto sector is likely to be affected by the standards, we do not rely on these results.

Other commenters point to expected increases in vehicle sales as a source of increased employment; these analyses are based on lower per-vehicle cost estimates and possibly greater consideration of fuel savings in the vehicle purchase decision. As discussed in Section 18.7 of this Response to Comments, the difference between the results in these studies and those from the Defour Group appear to be due to lower cost estimates and a greater role for fuel economy in vehicle purchase decisions in the former group. Several commenters specifically cite a study by Ceres showing an increase of 43,000 jobs in the auto industry in 2030. This employment appears to be driven by the need for additional workers to reconfigure vehicles and add technology (the cost effect), though it also estimates increases in vehicle sales. Ceres also shows job gains in the broader economy. As discussed in Preamble Section III.H.12 and RIA Chapter 8.2, we do not extend our analysis to the broader economy, because of uncertainty over the state of the macroeconomy in the time frame for this rule.

Additional comments point to gains in employment associated with developing the technologies that companies will use to comply with the standards. Several commenters cite a report from NRDC, NWF, and UAW, "Supplying Ingenuity," which estimates that 150,000 people are currently employed in companies that make "clean, fuel-efficient" technologies. As discussed in Preamble Section III.H.12 and RIA Chapter 8.2, we agree that the employment effects of this rule in the auto sector depend, not only on vehicle sales, but also on the need to develop and use the technologies for compliance with the standards, and any changes in labor intensity of production associated with the new technologies. EPA, in MY 2025, estimates increases due solely to increased expenditures on technologies on the order of 6,000-31,000 jobs in the auto industry.

A few commenters argue that, although employment may go down in fuel-related sectors, switching consumer spending from fuel to other sectors should increase employment, because fuel sectors have lower labor intensity than the economy as a whole. EPA acknowledges this possibility but has not estimated this effect in this rule.

Commenters differ on the effects of this rule on the competitiveness of the auto industry and its ability to innovate. Those who state that the rule will increase competitiveness and innovation cite increasingly stringent fuel economy standards in other countries; this rule will provide further incentives to coordinate vehicle and technology development for all these markets and speed cost reductions. In addition, they state that the standards will provide the regulatory certainty needed for increased investment in research and development and ensure continued innovation. The increased investment and innovation, they say, will increase employment in the auto industry. Those who state that innovation will decrease cite the need for auto manufacturers to invest specifically in fuel-saving technology, which will reduce their ability to invest in technological advances for other vehicle qualities and attributes (see comments from Edmunds.com). EPA disagrees that investing more in fuel economy requires reduced investments in improving other aspects of the vehicles; it is possible for auto makers to do both, except under the circumstances that they are unable to convince potential investors of the merits of those other improvements. As noted earlier in section 18.1, the agencies' costing methodology includes the costs of preserving all attributes in the present vehicle fleet. In addition, because all major auto makers selling vehicles in the U.S. are subject to the same rule requirements, we do not expect changes in the competitive structure of the industry, nor in where vehicles are produced, in response to these standards. EPA agrees that the standards are stringent enough to encourage continuing innovation on technologies that reduce GHG emissions and improve fuel economy, and that these innovations are likely to be useful for meeting standards in other countries besides the U.S. Companies that make the greatest advances in these innovations may increase their competitive position in both the U.S. and world markets.

A number of comments state that this rule will increase economic growth in the U.S. Several commenters recommend that EPA include an analysis of the economy-wide impacts of the rule, including impacts on U.S. gross domestic product (GDP) and consumption patterns. They say that fuel savings from the rule would allow consumers to increase their spending on other goods and services in more productive sectors of the economy, which would likely increase GDP and consumption in the U.S. CFA specifically recommended that EPA use a GDP multiplier approach that recognizes that national output would increase from the rule as a result of reducing U.S. oil imports and reducing consumer expenditures on fuel. Several commenters cite a report for Ceres by Management Information Services, Inc. that found that a 4 per cent annual improvement in fuel economy would increase U.S. gross economic output by $21.3 billion, personal income by $14.2 billion, and revenue for federal, state, and local governments by $12.7 billion in 2030.[92] On the other hand, other comments express concern that the economy could be harmed as a result of this rule, because increased vehicle costs will reduce vehicle sales and employment. Analyzing the economy-wide impacts from this rule is challenging due to the inherent uncertainty in projecting a myriad of economic parameters into the future (e.g., levels of employment of labor and capital, the structure of the economy, prices of goods and services) and determining an appropriate economic framework to model (e.g., supply equaling demand in all markets and specific forms of market interactions). EPA has not been able to identify a widely agreed upon methodology and thus we continue to not quantify the impacts of the rule on overall economic patterns in the U.S.

[92] Management Information Services, Inc., July 2011, “More Jobs Per Gallon: How Strong Fuel Economy/GHG Standards Will Fuel American Jobs”, A Ceres Report, Washington DC (Docket EPA-HQ-OAR-2010-0799).

19. EPA Statutory Authority

Organizations Included in this Section

American Fuel and Petrochemical Manufacturers (AFPM)
American Petroleum Institute (API), National Association of Manufacturers (NAM), and American Fuel & Petrochemical Manufacturers (AFPM)
Competitive Enterprise Institute (CEI)
Environmental Consultants of Michigan
Environmental Defense Fund (EDF)
Growth Energy
Natural Resources Defense Council (NRDC)
Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council
Steyn, R.
University of Michigan
U.S. Chamber of Commerce

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

In addition, the Agencies should not issue the revised proposal until after the court has ruled on the GHG lawsuits. [EPA-HQ-OAR-2010-0799-9485-A1, p.9]

Organization: American Petroleum Institute (API), National Association of Manufacturers (NAM), and American Fuel & Petrochemical Manufacturers (AFPM)

V. The 2017 Car Rule Would Also Be Arbitrary and Capricious Because It Is Based on an Invalid Endangerment Finding [EPA-HQ-OAR-2010-0799-9509-A1, p. 10]

Lastly, finalizing the 2017 Car Rule would also be arbitrary and capricious because the rule is predicated on an invalid endangerment finding. As the 2017 Car Rule itself explains, EPA's authority to propose the rule flows from the Endangerment Finding for GHGs. 76 Fed. Reg. 74,964. Thus, if the Endangerment Finding is invalid, EPA has no authority to finalize the 2017 Car Rule. For this reason, the Associations briefly explain some of the reasons why the Endangerment Finding is arbitrary and capricious. A more complete explanation is contained in the Associations' comments, which are also submitted here. Exhs. A-B. EPA's Endangerment Finding is arbitrary and capricious for several reasons: [EPA-HQ-OAR-2010-0799-9509-A1, pp. 10-11]

- The Endangerment Finding failed to weigh offsetting or beneficial effects of climate change against its threatened harms. Exh. A. at 7.
- The Endangerment Finding improperly failed to consider the possibility of adaptation to climate change. Id. at 8–9.
- The Endangerment Finding improperly relied on effects of climate change occurring outside of the United States, in violation of the CAA. Id. at 9–10.

- The Technical Support Document for the Endangerment Finding does not contain the critical review of all the science that EPA's Information Quality Act Guidelines require. Id. at 10-28.
- EPA's finding that GHGs endanger public health is not scientifically supported or justifiable under the CAA. Id. at 28–33.
- EPA's finding that GHGs endanger public welfare is not supported. Id. at 33–38.
- EPA's assertion that current atmospheric levels of GHGs endanger public health and welfare is not supported. Id. at 38–39.
- The Endangerment Finding is inappropriate because GHG emissions from motor vehicles are insubstantial. Id. at 40–42.
- The Endangerment Finding improperly includes two pollutants not emitted by mobile sources—perfluorocarbons and sulfur hexafluoride. Id. at 42–43.
- EPA failed to adequately explain its decision to exclude the most abundant GHG—water vapor—from its Endangerment Finding. Id. at 43–44.
- EPA should have proposed its rules for motor vehicles at the same time as its Endangerment Finding. Id. at 44.
- EPA failed to analyze the possible affect of its Endangerment Finding on stationary source permitting requirements. Id. at 45–49.
- EPA failed to explain why it did not use alternative approaches to addressing climate change, such as CAA Section 115. Id. at 49–50. [EPA-HQ-OAR-2010-0799-9509-A1, p. 11]

Organization: Competitive Enterprise Institute (CEI)

Experts will likely debate for years the net benefits of the rule as data become available regarding vehicle costs and sales and auto industry profits and employment. This comment letter examines a cost most experts have not addressed: the damage the Obama Administration's fuel economy agenda does to our constitutional system of separated powers and democratic accountability. [EPA-HQ-OAR-2010-0799-9552-A1, p. 1]

I. End Run Around Congress

In the press release announcing their proposed MY 2017-2025 GHG/fuel economy standards, EPA Administrator Lisa Jackson and Transportation Secretary Ray LaHood boast that they are bypassing Congress: "Today's announcement is the latest in a series of executive actions the Obama Administration is taking to strengthen the economy and move the country forward because we can't wait for Congressional Republicans to act" [emphasis added].3 [EPA-HQ-OAR-2010-0799-9552-A1, pp. 1-2]

A legislative proposal boosting average fuel economy to 54.5 mpg would not pass in the 112th Congress. Note also that NHTSA need not propose fuel economy standards for MY 2017 until 2014. "We can't wait" really means: We won't let the people's representatives decide, either now or after the 2012 elections. [EPA-HQ-OAR-2010-0799-9552-A1, p. 2]

Circumventing Congress has, alas, become the Administration's preferred M.O. Under the statutory scheme Congress created, one agency –NHTSA – regulates fuel efficiency through one set of standards – Corporate Average Fuel Economy (CAFE) – under one statute – the Energy Policy Conservation Act (EPCA). Yet today, three agencies – EPA, NHTSA, and the California Air Resources Board (CARB) – regulate fuel efficiency via three sets of standards under three statutes – the Clean Air Act (CAA), EPCA, and California Assembly Bill 1493. The CAA provides no authority to prescribe fuel economy standards, and EPCA specifically prohibits states from adopting laws or regulations "related to" fuel economy standards. [EPA-HQ-OAR-2010-0799-9552-A1, p. 2]

II. GHG, Fuel Economy Standards: Highly Related

EPA and CARB claim they are regulating GHG emissions, not fuel economy. But greenhouse gas emission standards implicitly regulate fuel economy. As EPA and NHTSA's May 2010 Tailpipe Rule explains, no commercially available technologies exist to capture or filter out carbon dioxide (CO_2) emissions from motor vehicles. Consequently, the only feasible way to decrease CO_2 emissions per mile is to reduce fuel consumption per mile — that is, increase fuel economy. Carbon dioxide constitutes 94.9% of vehicular greenhouse gas emissions, and "there is a single pool of technologies… that reduce fuel consumption and thereby CO_2 emissions as well."4 [EPA-HQ-OAR-2010-0799-9552-A1, p. 2]

That EPA and CARB are regulating fuel economy is also apparent from EPA, NHTSA, and CARB's Interim Joint Technical Assessment Report, the framework document for the agencies' proposed rule.5 The document considers four fuel economy standards, ranging from 47 mpg to 62 mpg; each is the simple reciprocal of an associated CO_2 emission reduction scenario. The 54.5 mpg standard is a negotiated compromise between the 4% (51 mpg) and 5% (56 mpg) CO_2 reduction scenarios. [EPA-HQ-OAR-2010-0799-9552-A1, p. 2]

CARB's 2004 Staff Report presenting the agency's plan to implement AB 1493 is another smoking gun.6 Nearly all of CARB's recommended technologies for reducing GHG emissions (Table 5.2-3) were previously recommended in a 2002 National Research Council study on fuel economy (Tables 3-1, 3-2).7 CARB proposes a few additional options, but each is a fuel-saving technology, not an emissions-control technology. [EPA-HQ-OAR-2010-0799-9552-A1, p. 2]

Even the text of AB 1493 implies that CARB is to regulate fuel economy. CARB's GHG standards are to be "cost-effective," defined as "Economical to an owner or operator of a vehicle, taking into account the full life-cycle costs of the vehicle."8 CARB reasonably interprets this to mean that the reduction in "operating expenses" over the average life of the vehicle must exceed the expected increase in vehicle cost.9 Virtually all such "operating expenses" are expenditures for fuel. The CARB program cannot be "cost-effective" unless CARB regulates fuel economy. [EPA-HQ-OAR-2010-0799-9552-A1, pp. 2-3]

V. Constitutional Common Sense

EPA contends that its current and future GHG rules derive from the CAA as interpreted by Supreme Court in Massachusetts v. EPA (April 2007). The D.C. Circuit Court of Appeals is now reviewing arguments regarding that claim in Coalition for Responsible Regulation v. EPA. [EPA-HQ-OAR-2010-0799-9552-A1, p. 4]

However that case is decided, EPA is clearly wielding powers Congress never intentionally delegated. [EPA-HQ-OAR-2010-0799-9552-A1, p. 4]

Congress declined to give EPA explicit authority to regulate GHGs only last year, when Senate leaders pulled the plug on companion legislation to the American Clean Energy and Security Act (ACESA) – the House-passed cap-and-trade bill sponsored by Reps. Henry Waxman (D-Calif.) and Ed Markey (D-Mass.). [EPA-HQ-OAR-2010-0799-9552-A1, p. 5]

One of ACESA's selling points was precisely that it would preempt regulation of GHGs under several CAA programs. If instead of proposing cap-and-trade, Waxman and Markey had introduced legislation authorizing EPA to do exactly what it is doing now – regulating GHGs via the CAA as it sees fit – their bill would have been dead on arrival. [EPA-HQ-OAR-2010-0799-9552-A1, p. 5]

The notion that Congress gave EPA such expansive authority when it enacted the CAA in 1970, years before global warming emerged as a public policy concern, defies both history and logic. [EPA-HQ-OAR-2010-0799-9552-A1, p. 5]

[See footnote list for this comment on pp. 5-6 of Docket number EPA-HQ-OAR-2010-0799-9552-A1]

Organization: Environmental Consultants of Michigan

EPA erred in its implementation of the Supreme Court decision on GHG emissions [NHTSA-2010-0131-0166-A1, p. 4]

On April 2, 2007, the U.S. Supreme Court issued its opinion in Massachusetts v. EPA, a case involving EPA's 2003 denial of a petition for rulemaking to regulate GHG emissions from motor vehicles under section 202(a) of the Clean Air Act (CAA). The Court held that GHGs fit within the definition of air pollutant in the Clean Air Act and further held that the Administrator must determine whether or not emissions from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. The Court further ruled that, in making these decisions, the EPA Administrator is required to follow the language of section 202(a) of the CAA. The Court rejected the argument that EPA cannot regulate CO_2 from motor vehicles because to do so would de facto tighten fuel economy standards, authority over which has been assigned by Congress to DOT. The Court stated that ''[b]ut that DOT sets mileage standards in no way licenses EPA to shirk its environmental responsibilities. EPA has been charged with protecting the public's 'health' and 'welfare', a statutory obligation wholly independent of DOT's mandate to promote energy efficiency.'' The Court concluded that ''[t]he two obligations may overlap, but there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency.'' The case was remanded back to the Agency for reconsideration in light of the Court's decision. [NHTSA-2010-0131-0166-A1, pp. 4-5]

EPA could have honored the decision of the Supreme Court by regulating the carbon content of the fuel as is done in Europe; instead, they immediately began a duplicative tailpipe carbon dioxide standard. EPA initially argued that their greenhouse gas standard was necessary because there were vehicle emissions that were not covered by the CAFÉ equivalent standard. All of these other GHG pollutants are currently regulated by the existing EPA tailpipe or evaporative emission standards. In May 2009, the National Fuel Efficiency Policy was announced that for the first time provided what amounted to double jeopardy for vehicle manufacturers with duplicative greenhouse gas standards and CAFÉ standards. This unprecedented level of control provides two sets of compliance regulations and two sets of penalties (fines) for what amounts to a single action. [NHTSA-2010-0131-0166-A1, p. 5]

EPA should have done a thorough analysis of the policy alternatives prior to arbitrarily jumping to vehicle tailpipe standards. A fair and balanced policy review would have led to a different policy to achieve the target, one that changes the fuel such as the required use of a renewable Fischer-Thropsch fuel. The DoE GREET model demonstrates that usage of this fuel can be an effective strategy for achieving GHG reductions unlike the slow and limited progress that accompanies tailpipe standards. This policy would have the secondary effect of reducing petroleum consumption. [NHTSA-2010-0131-0166-A1, p. 5]

Organization: Environmental Defense Fund (EDF)

III. EPA HAS EXPANSIVE AUTHORITY UNDER THE CAA TO REGULATE GHG EMISSIONS FROM LIGHT DUTY VEHICLES AND NHTSA'S AUTHORITY IS MORE CONSTRAINED IN SEVERAL IMPORTANT WAYS

A. EPA and NHTSA have Different Statutory Mandates

The primary purpose of EPA's regulation under the Clean Air Act is "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." 42 U.S.C. § 7401(b)(1) (emphasis added). This protective purpose is reflected in the text of Section 202 of the Act. Section 202(a) requires the EPA Administrator to promulgate standards for the emission of air pollutants from new motor vehicles "which in his [her] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." 42 U.S.C. § 7521(a) (emphasis added). Both the "may reasonably be anticipated" and "endanger" language reflect Congress' intent for EPA to act in a manner that prevents, rather than merely responds to, harm. See Ethyl Corp. v. EPA, 541 F.2d 1, 12 (D.C. Cir. 1976) ("[E]ndangers means something less than actual harm. When one is endangered, harm is threatened; no actual injury need ever occur."). Because of the important public health purpose and preventative nature of the Clean Air Act's mandate, EPA's authority to regulate under it is far-reaching. [EPA-HQ-OAR-2010-0799-9519-A1, pp. 4-5]

The National Highway Traffic Safety Administration (NHTSA)'s purpose in implementing the Energy Policy Conservation Act (EPCA) is "to provide for improved energy efficiency of motor vehicles." 42 U.S.C. § 6201(5). This mandate, while vital to curbing our Nation's energy use, is narrowly focused on one aspect of motor vehicles— fuel efficiency—without regard to the vehicles' effects on public health and welfare. The purposes of these two Acts are "wholly independent," as the Supreme Court made clear in Massachusetts v. EPA, 549 U.S. 497, 531-32 (2007): [EPA-HQ-OAR-2010-0799-9519-A1, p. 5]

EPA finally argues that it cannot regulate carbon dioxide emissions from motor vehicles because doing so would require it to tighten mileage standards, a job (according to EPA) that Congress has assigned to DOT. See 68 Fed. Reg. 52929. But that DOT sets mileage standards in no way licenses EPA to shirk its environmental responsibilities. EPA has been charged with protecting the public's "health" and "welfare," 42 U. S. C. 7521(a)(1), a statutory obligation wholly independent of DOT's mandate to promote energy efficiency. See Energy Policy and Conservation Act, §2(5), 89 Stat. 874, 42 U. S. C. §6201(5). The two obligations may overlap, but there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency. [EPA-HQ-OAR-2010-0799-9519-A1, p. 5]

B. EPA's Expansive Authority under Section 202

For light-duty vehicles, as well as heavy-duty vehicles, EPA's authority, and imperative, to protect human health and the environment through rigorous emission standards is more far-reaching and effective than the U.S. Department of Transportation's authority to set standards for fuel economy because of EPA's ability to address all greenhouse gases, to efficiently and effectively address the interactions between all vehicle components, and due to the breadth of the delegated rulemaking authority and associated protections under the Clean Air Act. [EPA-HQ-OAR-2010-0799-9519-A1, p. 5]

EPA has broad authority under Section 202(a)(1) of the Clean Air Act to "prescribe . . . standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." 42 U.S.C. § 7521(a)(1) (emphasis added); see also id. §7521 (a) (EPA authorized to set standards for air pollutants from vehicles and engines "whether such vehicles and engines are designed as complete systems or incorporate devices to prevent or control such pollution"). This language clearly delegates to EPA the responsibility to adopt standards for air pollutants. EPA relies on this authority in the proposed rule to regulate, in addition to CO_2, N2O, CH4, and hydrofluorocarbon (HFC) emissions. All of these substances are listed among the "primary GHGs of concern" as contributors to global warming. 76 Fed. Reg. at 74,963. [EPA-HQ-OAR-2010-0799-9519-A1, pp. 5-6]

C. Constraints on NHTSA's Authority

In contrast to EPA's expansive authority under Section 202 of the Clean Air Act, EPCA as amended by EISA includes limitations on NHTSA's authority to regulate fuel economy. NHTSA's authority is focused on fuel economy and not air pollution, and as a result, NHTSA is constrained in regulating direct discharges of N20, CH4, and HFC emissions from automobiles. 76 Fed. Reg. at 74,902. [EPA-HQ-OAR-2010-0799-9519-A1, p. 6]

Within its focus on fuel economy, EPCA contains additional, limitations on NHTSA's discretion to establish CAFE standards including the nexus to fuel efficiency. And, of particular importance, any proposed expansion of NHTSA's fuel economy analysis must be consistent with EPA's statutorily-mandated procedures to test fuel economy. [EPA-HQ-OAR-2010-0799-9519-A1, p. 6]

EPCA directs the Secretary of Transportation to prescribe CAFE standards, which "shall be the maximum feasible average fuel economy level that the Secretary decides the manufacturers can achieve in that model year." 49 U.S.C. § 32902; see also § 32902(f) (directing the Secretary to consider statutorily-enumerated factors in making this determination). While NHTSA has discretion in standard setting, under EPCA, EPA alone has the authority to measure fuel economy and to calculate CAFE values, 49 U.S.C. § 32904(a). In doing so, EPA "shall use the same procedures for passenger automobiles the Administrator used for model year 1975 . . . or procedures that give comparable results." Id. at 32904(c). The D.C. Circuit has concluded that, to produce "comparable results," "[t]he critical fact is that a procedure . . . was available for MY1975 testing, and those manufacturers, however few in number, that found it advantageous to do so, employed that procedure." Center for Auto Safety v. EPA, 806 F.2d 1071, 1077 (D.C. Cir. 1986). [EPA-HQ-OAR-2010-0799-9519-A1, p. 6]

In a previous rulemaking, the agencies concluded that this statutory structure did not allow for incorporation of air-conditioning efficiency improvement and off-cycle technology credits into NHTSA's fuel economy analysis. 75 Fed. Reg. at 25,544 ("The CAFE standards and compliance testing cannot capture all of the real world CO_2 emissions, because EPCA currently requires EPA to use the 1975 passenger car test procedures under which vehicle air conditioners are not turned on during fuel economy testing."); 25,663 (requesting comment on including air conditioning credits in light-truck testing requirements but emphasizing "that modernizing the passenger car test procedures as well would not be possible under EPCA as currently written."). [EPA-HQ-OAR-2010-0799-9519-A1, p. 6]

In this proposal, however, the agencies forward different legal rationales, id. at 74,998, which they characterize as "major changes" from past practice, id., that would allow them to incorporate air-conditioning efficiency and off-cycle technology improvements into NHTSA standard setting. Both the agencies themselves, supra, and regulated industry have raised questions regarding this conclusion. See EPA Doc. No. OAR-2009- 0472-7123.1 at 17 (Comments of Association of International Automakers on LDV Phase I) (noting that the Association "does not support fundamentally changing the fuel economy/greenhouse gas test procedures at this time"); see also EPA Doc. No. EPA-HQOAR- 2003-0214-0208 at 10 (Comments of the Alliance of Automobile Manufacturers) (noting that any change in test procedures would require EPA "to develop a complex set of test procedure adjustment factors to ensure that the new procedures 'give comparable results' to the existing ones"). [EPA-HQ-OAR-2010-0799-9519-A1, pp. 6-7]

D. EPA and NHTSA Must Carefully Coordinate the Joint Rulemaking

Alone, NHTSA's CAFE standards cannot capture the significant opportunities for meaningful greenhouse gas reductions available to EPA pursuant to its broad authority under the Clean Air Act to address air pollution for the protection of human health and welfare. As such, EDF strongly supports the agencies' focus on a joint rulemaking proposal that is "carefully coordinated and harmonized," and, like the agencies, EDF recognizes that such coordination must be "in accordance with all substantive and procedural requirements imposed by law" to achieve durable and legally-defensible results. 76 Fed. Reg. 74,860; see also 76 Fed. Reg. at 74,902 (describing differences in the agencies' statutory authorities, including EPA's ability to address various GHGs and EPA's ability to account for certain compliance adaptability). Indeed, the regulated community has long questioned the scope of NHTSA's authority. In contrast, there is a well established body of law affirming the broad authority of EPA under the Clean Air Act to adopt emission standards protecting human health and welfare from air pollutants. [EPA-HQ-OAR-2010-0799-9519-A1, p. 7]

EDF applauds the agencies' efforts to collaborate on regulations to reduce greenhouse gas emission and improve fuel economy and recognizes the imperative of doing so consistent with the agencies' separate statutory mandates. EDF also recognizes the imperative of EPA action under the full breadth and protections of the Clean Air Act to safeguard human health and the environment from harmful air pollutants and to ensure those protections are lasting through EPA's durable, tested delegated rulemaking authority. [EPA-HQ-OAR-2010-0799-9519-A1, p. 7]

Organization: Growth Energy

If EPA believes that the examination of the proposal to increase octane outlined in Attachment 3 is unnecessary or inappropriate because it lacks authority under section 211 of the Clean Air Act to take the recommended action, then the Agency should fully explain why it believes it lacks that authority, among other reasons so that Congress can consider appropriate changes in the statute. [EPA-HQ-OAR-2010-0799-9505-A1. p. 6]

Organization: Natural Resources Defense Council (NRDC)

With this proposal, EPA is leveraging four decades of authority and expertise in successfully regulating conventional pollutants from mobile sources to establish controls on GHG emissions. While past improvements to Corporate Average Fuel Economy (CAFE) have made some progress in reducing GHG emissions, the Clean Air Act authority is a far superior statute for the purpose of controlling greenhouse gas (GHG) emissions since it provides the agency the ability to adopt forward looking standards that are consistent with long-term environmental targets, address all GHG emissions—not just carbon dioxide, and accurately reflect the true carbon impacts of substituting different fuels for gasoline through life-cycle analysis. [EPA-HQ-OAR-2010-0799-9472-A2, p. 2]

II. Clean Air Act is Appropriate Statute for Regulating Greenhouse Gases from Motor Vehicles

The Supreme Court in Massachusetts v. EPA ruled that the Clean Air Act (CAA) requires the adoption of standards to control greenhouse gas (GHG) pollution from motor vehicles if EPA determines that these emissions contribute to endangerment of public health or welfare. With the model year 2012-2016 National Program Final Rule, the U.S. EPA and NHTSA established an important partnership that ensures that the pollution and health protections of the CAA are appropriately aligned with the fuel-conservation directive of the Energy Policy and Conservation Act (EPCA). The latest proposal maintains that current partnership and alignment. [EPA-HQ-OAR-2010-0799-9472-A2, p. 7]

EPA has used its authority and technical expertise to successfully regulate conventional pollutants from mobile source emissions for nearly four decades. Since the 1970s, EPA has significantly reduced transportation emissions by establishing performance-based standards for all categories of mobile sources. The impact has led to tremendous success -- EPA's mobile source emission programs have reduced conventional pollutants from today's new personal vehicles by 98-99 percent compared to those sold in the 1960s. EPA's fuel programs have effectively removed lead from gasoline and most recently, led to the development of ultra low sulfur diesel in the U.S. and advanced clean diesel technologies. [EPA-HQ-OAR-2010-0799-9472-A2, p. 7]

Several major factors have led to EPA's success in controlling conventional pollutants from mobile sources. These same factors provide the Agency with distinct advantages in terms of regulating greenhouse gas emissions. [EPA-HQ-OAR-2010-0799-9472-A2, p. 7]

First, unlike EPCA which limits NHTSA to setting standards just five years into the future, the CAA allows EPA to set technology-forcing standards that consider longer-term environmental targets. With this latest proposal, EPA is proposing standards for a nine-year period into the future, consistent with previous pollution emission standards. Addressing the multi-generational environmental challenges of climate change is virtually impossible with only a five-year perspective that necessarily relies upon only incremental additions of new technologies. This longer-term, innovation-based approach creates the regulatory certainty necessary for automakers to strategically plan for and invest in emerging and advanced technologies that are needed to meet climate stabilization goals. [EPA-HQ-OAR-2010-0799-9472-A2, pp. 7-8]

Second, it is critical to address all GHG emissions, not just CO_2. Unlike EPCA, the CAA allows EPA to set standards that directly address non-CO_2 GHG pollutants, in particular HFC-134a, N2O, and CH4. According to EPA, these latter GHG pollutants currently compose 7.2 percent of the effective vehicle GHG emissions.31 Inclusions of these pollutants enable EPA to adopt GHG standards that achieve the maximum feasible reductions in GHGs in the most flexible and cost-effective manner possible. [EPA-HQ-OAR-2010-0799-9472-A2, p. 8]

Third, the CAA allows EPA to adopt standards that accurately reflect the true impacts of substituting different fuels for gasoline. Environmentally effective GHG standards must consider both the carbon content and lifecycle emissions. Since fuel economy standards only consider the miles driven per gallon of fuel used, it fails to account for the fact that a fuel such as diesel has a higher carbon content per gallon than gasoline. Fuel economy standards under EPCA also do not properly account for the differences in upstream emissions of different types of fuels. Ignoring upstream emissions for fuels such as electricity, hydrogen, biofuels and diesel tend to inflate their GHG benefits in comparison to gasoline. For example, a diesel-fueled vehicle that achieves a fuel economy benefit of 20 percent or more versus a conventional gasoline-fueled vehicle using diesel produced from coal (i.e. coal-to-liquid) could result in almost two times greater GHG life-cycle on a per mile basis due to the inherently higher carbon content of diesel and the extremely high carbon emissions associated with producing a diesel-like fuel from coal. [EPA-HQ-OAR-2010-0799-9472-A2, p. 8]

It is important to note that using the Clean Air Act to control carbon pollution was first initiated by the Bush administration. In fact, in May 2007, a month after the Supreme Court's landmark decision in Massachusetts v. EPA, President Bush went to the Rose Garden and ordered EPA Administrator Johnson to carry it out by setting carbon pollution standards for new vehicles. [EPA-HQ-OAR-2010-0799-9472-A2, p. 8]

In January 2008, Administrator Johnson appealed directly – albeit unsuccessfully – to President Bush to allow EPA to carry out the law. His letter to the president stated that the science supported "a positive endangerment determination" on carbon pollution and "does not permit a negative finding."32 The Johnson letter reveals three important facts: [EPA-HQ-OAR-2010-0799-9472-A2, p. 8]

(1) That the Bush administration's EPA thought "a positive endangerment finding" was compelled by both the science and the law. Johnson wrote that the Supreme Court's decision "combined with the latest science of climate change requires the Agency to propose a positive endangerment finding." He continued: "the state of the latest climate change science does not permit a negative finding, nor does it permit a credible finding that we need to wait for more research." [EPA-HQ-OAR-2010-0799-9472-A2, pp. 8-9]

(2) That Johnson's action plan – to issue an endangerment finding, set vehicle standards, and more – had "Cabinet-level" buy-in. Johnson wrote that the scientific and legal need to issue a positive endangerment finding "was agreed to at the Cabinet-level meeting in November." He continued: "A robust interagency policy process involving principal meetings over the past eight months has enabled me to formulate a plan that is prudent and cautious yet forward thinking." [EPA-HQ-OAR-2010-0799-9472-A2, p. 9]

(3) That Johnson's action plan contained exactly the same steps that his successor, Lisa Jackson, has carried out. Johnson told President Bush he had formulated a "prudent and cautious yet forward thinking" action plan that "will fulfill your Administration's obligations under the Supreme Court decision." Phase 1 of the plan called for these actions: [EPA-HQ-OAR-2010-0799-9472-A2, p. 9]

In response to the Supreme Court mandate in Massachusetts v EPA, issue a proposed positive endangerment finding for public notice and comment as agreed to in the policy process. [EPA-HQ-OAR-2010-0799-9472-A2, p. 9]

In response to the direction in [the Energy Independence and Security Act], issue a proposed vehicles rule jointly with the Department of Transportation to implement the new EISA and address issues raised in the Supreme Court case. [EPA-HQ-OAR-2010-0799-9472-A2, p. 9]

To address requirements under the Clean Air Act, issue a proposed rule to update the New Source Review program to raise greenhouse gas thresholds to avoid covering small sources and to better define cost-effective, available technology. [EPA-HQ-OAR-2010-0799-9472-A2, p. 9]

--Quoted from letter from EPA Administrator Stephen Johnson to President Bush, January 31, 2008. [EPA-HQ-OAR-2010-0799-9472-A2, p. 9]

31 4.3 percent, 2.7 percent and 0.2 percent respectively. 74 FR 49454 at 49524, 49525, 49532. [EPA-HQ-OAR-2010-0799-9472-A2, p. 8]

32Steven L. Johnson, Former EPA Administrator, Memo to Former US President George Bush, January 31, 2008. [EPA-HQ-OAR-2010-0799-9472-A2, p. 8]

Organization: Sierra Club, Environment America, Safe Climate Campaign, and Clean Air Council

The National Program accounts for both EPA's and NHTSA's authority and requires no additional action: NHTSA notes that it is "confronted with the issue of how to treat" EPA standards in setting its own standards under EPCA and EISA. The Supreme Court has ruled that EPA has the authority to regulate greenhouse gases such as CO_2, holding that the Clean Air act "is unambiguous" in its "sweeping definition of 'air pollutant';" that the statute "embraces all airborne compounds of whatever stripe," including the greenhouse gasses "[c]arbon dioxide, methane, nitrous oxide, and hydrofluorocarbons."34 Both the prior rule for MY 2012-16 vehicles and this NPRM, which continues the process of joint standard setting with California and EPA carries out the Mass. v. EPA decision. The NPRM and the prior rule demonstrate successful cooperation and NHTSA's capacity to both account for, and in fact, improve upon its standard setting process. [EPA-HQ-OAR-2010-0799-9549-A2, p. 10]

34 Massachusetts v. E.P.A, 549 U.S. 497, 528-29 (2007). [EPA-HQ-OAR-2010-0799-9549-A2, p. 10]

Organization: Steyn, R.

* EPA has NO statutory authority to determine fuel economy standards for any reason. [EPA-HQ-OAR-2010-0799-8724-A1, p. 2]

Organization: University of Michigan

A Call to EPA and NHTSA to Consider the Consumer Fuel Usage Reduction Options in the Mid-term Evaluation of the Greenhouse-Gas Emission and Corporate Average Fuel Economy Standards for Light-Duty Vehicles. [EPA-HQ-OAR-2010-0799-7986-A1, p. 1] [This comment can also be found in section 2.4 of this comment summary.]

The emission standard is completely based on vehicle technology applied to a specific drive cycle. Even the potential off-cycle credits are based on technology advancements or vehicle hardware improvements. In the past, meeting the emission standards for regulated pollutants has been the sole responsibility of the vehicle manufacturers. This is appropriate since (1) only the manufacturers can implement the emission control technologies on the vehicles, (2) the impact of fuels and vehicle usage on pollutant emissions are relatively limited, and (3) the cost of such implementation has not been excessive even though we may be approaching the state of diminishing return. In the case of GHG emissions from light-duty vehicles, however, vehicle technology is only one of three contributors. The others are vehicle fuels and consumer usage. Vehicle technology alone cannot shoulder the full burden of CO_2 emission reductions in mobile sources when carbon-containing fuels are used. CO_2 emissions are directly proportional to the amount of carbon-containing fuels (in the well-to-wheels sense) used in propelling the vehicles. [EPA-HQ-OAR-2010-0799-7986-A1, pp. 1-2]

The laws of physics dictate the limits of technology capability in CO_2 emission reduction. Economics and material resource availability further constrain the potential affordability of some new technologies, low-carbon fuels and their accompanying infrastructure, even when financial incentives are provided to cushion the costs of initial investments. It is obvious that in the effort toward increasingly stringent reductions of GHG emissions, the role of consumer fuel usage can no longer be ignored. As both the EPA and NHTSA will be undertaking the midterm evaluation of the GHG emission and the corporate average fuel economy standard for model year 2022-2025 vehicles in due course, we recommend that meaningful incentives for consumer fuel usage reduction be taken into consideration. [EPA-HQ-OAR-2010-0799-7986-A1, p. 2] [The last sentence of this comment can also be found in section 2.4 of Docket number EPA-HQ-OAR-2010-0799-7986-A1]

Bringing the consumer's energy usage into the picture for CO_2 emission reduction is obviously nontrivial. Cap-and-trade and carbon tax are two known economically efficient approaches in reducing CO_2 emissions. Cap and trade is a massive undertaking and can be achieved by an upstream and/or a downstream approach. In the upstream approach, carbon trading is achieved at the level of fuel producers with the incurred cost adjustments being eventually borne by fuel users. In the downstream approach, consumers directly adjust their fuel usage through available fuel or carbon tradable credits available to them. Anticipating the advent of cap and trade in the US at the time, Ellerman, Jacoby and Zimmerman (2006) proposed a mechanism to bring the CAFE standard into the realm of cap and trade. Their rationale and proposed mechanism are most definitely worthy of further consideration. Carbon tax is considerably simpler to design and administer but will likely face substantial political resistance in the US, perhaps even when the designed carbon-tax system is revenue neutral. [EPA-HQ-OAR-2010-0799-7986-A1, pp. 2-3]

In the absence of the two most efficient fossil-carbon-fuel usage reduction programs, other options need to be explored. Opportunities abound in the design of new mobility options. Key among them includes incentives for transit usage (both public and private in the broadest sense) that can be translated into verifiable CO_2 emission and equivalent fuel-economy credits; manufacturer's or consumer credits for encouragement of telecommuting, car pooling, use of public and private transit options, credits for coupling of private and public transportation modes for trip completion; credits for use of car-share systems as well as taxi and private shuttle use that lead to actual fuel use reduction; use of mileage-based vehicle-insurance policies, and other new incentives for total annual trip mileage reduction that can be translated into CO_2 reduction credit. While it is difficult to assess the most feasible and equitable fuel-usage reduction programs at this time, this fact should not deter the EPA and NHTSA to explore and to encourage the public to explore these options. It is only a matter of time that non- hardware-related, carbon-fuel usage reduction options must become an integral part of a workable and meaningful CO_2 and GHG emission reduction program. It is high time that we seriously consider novel ways to power our vehicles and facilitate innovation in broader approaches to mobility to create new options and incentivize behavior that reduces CO_2 and GHG emission. [EPA-HQ-OAR-2010-0799-7986-A1, pp. 3-4]

Reference: Ellerman, A.D., Jacoby, H.D. and Zimmerman, M.B. (2006): “Bringing Transportation into a Cap-and-Trade Regime.” MIT Joint Program on the Science and Policy of Global Change, Report No. 136, June. [EPA-HQ-OAR-2010-0799-7986-A1, p. 4]

Organization: U.S. Chamber of Commerce

Moreover, as was the case with the 2012-2016 fuel economy rule, the Chamber has serious concerns with the redundant regulatory framework proposed for 2017-25, and recommends consolidation into a single program administered by NHTSA. [EPA-HQ-OAR-2010-0799-9521-A1, p. 1]

II. There Must Be One Fuel Economy Rule, Administered By NHTSA

The Chamber believes there should be only one rule governing fuel economy, administered by NHTSA under its existing authority. The Energy Policy and Conservation Act (EPCA)3 gives NHTSA authority to set mandatory CAFE standards for motor vehicles. To the extent that EPA’s rule is the same as NHTSA’s, there is no need for the rule. If EPA’s rule provides added benefits, then those benefits should be identified with specificity and any EPA regulations should be narrowly tailored to achieve those additional objectives.4 [EPA-HQ-OAR-2010-0799-9521-A1, p. 3]

EPA attempts to justify two rules on the basis that its standards, unlike NHTSA’s, include air conditioning improvements and slightly different compliance flexibilities. However, just a few sentences later, EPA admits the obvious: [EPA-HQ-OAR-2010-0799-9521-A1, p. 3]

These differences, however, do not change the fact that in many critical ways the two agencies are charged with addressing the same basic issue of reducing GHG emissions and improving fuel economy. The agencies are looking at the same set of control technologies (with the exception of the air conditioning leakage-related technologies). The standards set by each agency will drive the kind and degree of penetration of this set of technologies across the vehicle fleet. As a result, each agency is trying to answer the same basic question—what kind and degree of technology penetration is necessary to achieve the agencies’ objectives in the rulemaking time frame, given the agencies’ respective statutory authorities?5 [EPA-HQ-OAR-2010-0799-9521-A1, pp. 3-4]

In other words, there is little to no need for dual sets of regulations by EPA and NHTSA. [EPA-HQ-OAR-2010-0799-9521-A1, p. 4]

As the Chamber pointed out in its comments on the 2012-2016 program, EPA can regulate air conditioning improvements without even using Title II of the Clean Air Act. Title VI of the Act, “Stratospheric Ozone Protection,” gives EPA wide flexibility to regulate motor vehicle air conditioners and their emissions.6 Section 608 and its corresponding regulations govern the use and disposal of ozone-depleting substances—of which air conditioning refrigerant qualifies—and prohibits the knowing release of these substances into the atmosphere.7 Section 609, entitled "Servicing of motor vehicle air conditioners," and the regulations at 40 C.F.R. Part 82 subpart B, set forth specific regulations for the handling of motor vehicle air conditioning refrigerant during servicing and upon disposal.8 Section 612 and its corresponding regulations set forth criteria for evaluation of substitutes for existing ozone-depleting substances.9 [EPA-HQ-OAR-2010-0799-9521-A1, p. 4]

It seems as though the only reason EPA feels the need to regulate fuel economy is to pacify California, which remains the driving force behind the continuation of this bizarre tripartite fuel economy arrangement. But the California problem is one of EPA's own making, one that could have easily been avoided by denying its request for a waiver to regulate greenhouse gases from motor vehicles. [EPA-HQ-OAR-2010-0799-9521-A1, p. 4]

The Clean Air Act requires EPA to justify its emissions standards by articulating a rational connection between the alleged risk and the selected standards.10 To avoid irrational regulation, EPA must explain how its emissions standards will meaningfully ameliorate the endangerment risk it has identified.11 EPA once again appears to provide shaky evidence regarding whether its own rule will meaningfully avert any predicted danger not already averted by NHTSA's standards. Likewise, EPA appears to overstate the potential benefits that accrue from EPA's rule that would not otherwise occur from NHTSA's. [EPA-HQ-OAR-2010-0799-9521-A1, pp. 4-5]

EPA has consistently maintained that Massachusetts v. EPA12 recognized that EPA has a statutory obligation "wholly independent" from NHTSA. But the Supreme Court was only recognizing that EPA had an obligation to examine the issue of GHG regulation and could not side-step that obligation merely because NHTSA has authority to regulate fuel economy. Nothing in Massachusetts suggests that EPA should ignore NHTSA's specific fuel-economy regulations or that EPA may refuse to consider whether those regulations are sufficient to realize its own GHG reduction goals. Indeed, Massachusetts made clear that "there is no reason" NHTSA and EPA could not "administer their obligations" in a way that "avoid[s] inconsistency."13 There is accordingly no reason EPA should not take into account GHG reductions achieved by NHTSA's rules, especially because Congress has given NHTSA (unlike EPA) a mandatory, specific instruction to promulgate fuel-economy standards. [EPA-HQ-OAR-2010-0799-9521-A1, p. 5]

For all of the foregoing reasons, the Chamber strongly recommends issuing a single fuel economy rule for the 2017-2025 period, administered by NHTSA. [EPA-HQ-OAR-2010-0799-9521-A1, p. 5]

---

4 To the extent EPA continues to interpret this rule as triggering absurd regulation on other sources that requires rewriting of the statute (i.e. the Tailoring Rule), then this rule relies on an improper and untenable construction of the statutory requirements. Moreover, EPA must consider all of the costs and consequences of its rule in a meaningful fashion.

6 Congress even recognized the ability to limit greenhouse gas emissions through Title VI: Section 602(e), entitled "Ozone-depletion and global warming potential," requires the Administrator to assess the global warming potential of each ozone-depleting substance covered by Title VI.

7 42 U.S.C. § 7671g.

8 Id. at § 7671h.

9 Id. at § 7671i.

10 See Small Refiner Lead Phase-Down Task Force v. EPA, 705 F.2d 506, 525 (D.C. Cir. 1983); Ethyl Corp. v. EPA, 541 F.2d 1 (D.C. Cir. 1976); see also CAA § 307(d)(9).

11 See Chemical Mfrs., 217 F.3d 861, 865-67 (D.C. Cir. 2000) (although statute mandated regulation, EPA still must show that regulations served statutory objectives); Alabama Power Co. v. Costle, 636 F.3d 323, 360 (D.C. Cir. 1979) (interpretations that "mandate pointless expenditures of effort" should be avoided).

12 549 U.S. 497 (2007).

13 Id. at 532.

Response:

The comments that EPA lacks authority to issue standards controlling GHG emissions from new motor vehicles, that EPA's regulations rest on an incorrect finding that greenhouse gases endanger public health and welfare, and that EPA should defer any regulation to NHTSA under the CAFE program, have all been rejected by the D.C. Circuit in Coalition for Responsible Regulation v. EPA, No. 09-1322 (June 26, 2012). In particular, the court held that the endangerment finding was reasonable and fully grounded and supported by the vast body of scientific literature and information on climate change, and that EPA had a mandatory duty under section 202 (a) to issue the MYs 2012-2016 standards. Slip op. pp. 22-34, 40-43. Section 202 (a) (1) further provides that EPA may revise section 202 (a) "from time to time", which authority EPA is exercising in this proceeding. The Coalition for Responsible Regulation court likewise rejected arguments that EPA had any discretion to defer regulation of vehicular GHGs due to NHTSA's authority under EPCA/EISA: "Just as EPA lacks authority to refuse to regulate on the grounds of NHTSA's regulatory authority, EPA cannot defer regulation on that basis." Slip op. p. 41. The commenters' argument that the EPA and NHTSA programs are duplicative is also factually wrong. As with the MYs 2012-2016 rules, the section 202 (a) GHG standards "provide benefits above and beyond those resulting from NHTSA's fuel-economy standards." Slip op. p. 42. These benefits "above and beyond" are not just from control of direct air conditioning emissions, as the commenters mistakenly would have it. The GHG rules result in more reductions of CO_2 emissions (see preamble Tables III-61 and IV-42), and more reductions in petroleum consumption than the CAFE rules (see preamble Tables III-80 and IV-41). These incrementally greater reductions of both GHGs and savings of petroleum are substantial: Thus, even assuming that the MYs 2022-2025 augural CAFE standards were actually in place, the GHG rules are estimated to achieve 17%, 23%, and 27% greater reductions in GHG emissions in calendar years 2030, 2040, and 2050, and to achieve 9%, 18%, and 20% greater reductions in petroleum than the CAFE standards in those same calendar years. The differences are far greater in fact, since there are no CAFE standards after MY 2021.

The comment that these rules are an end-run on Congressional authority are likewise misplaced. Section 202 (a) has been definitively construed as applying to carbon pollution, and EPA's duty to determine if carbon pollution endangers public health and welfare, and to issue standards to control emissions of the pollutants which endanger is mandatory. EPA is thus implementing the authority delegated by Congress, not flouting Congressional authority.

Comments that the GHG rules should reflect fuel content, or otherwise should be based on lifecycle analysis rather than tailpipe emissions are addressed in sections 6 and 14 of this document. We note here that section 202(a) standards address control of vehicular emissions. Converting that program into a fuel-based program would constitute a dramatic distortion of the purpose and structure of the *vehicle* emissions standard program. There is no good reason to consider such a result, and that is especially the case here where there is a separate fuel based program, the RFS program, that achieves a reduction in lifecycle GHG emissions associated with the diesel fuel used by motor vehicles, through a mandate to use certain renewable diesel fuels.

Regarding comments from the University of Michigan, some of the concepts suggested by the commenter go beyond the scope of this rule. Nevertheless, EPA appreciates the suggestions of the commenter, and notes that we have been involved in programs that encourage the voluntary change in travel behavior, such as encouraging commuters to use public transportation.

20. Statutory and Executive Orders

Organizations Included in this Section

American Petroleum Institute (API), National Association of Manufacturers (NAM), and American Fuel & Petrochemical Manufacturers (AFPM)
Center for Biological Diversity
Competitive Enterprise Institute (CEI)
Growth Energy
Pacific Legal Foundation (PLF)
RVIA

Organization: American Petroleum Institute (API), National Association of Manufacturers (NAM), and American Fuel & Petrochemical Manufacturers (AFPM)

Contrary to the text of the statute, and the Supreme Court's direction in Massachusetts, EPA failed to consider the cost of compliance with the stationary source regulations that the 2017 Car Rule could trigger. [EPA-HQ-OAR-2010-0799-9509-A1, p. 9]

EPA failed to perform a host of other mandatory analyses, including but not limited to: [EPA-HQ-OAR-2010-0799-9509-A1, p. 9]

- Under the Regulatory Flexibility Act (RFA), 5 U.S.C. §§ 603(a) & 605(b), EPA must prepare an analysis that describes the effects of a proposed rule on small businesses, or certify that there are no such effects. Despite EPA's assertion that vehicle emissions standards trigger permitting requirements for stationary sources, it certified that the 2017 Car Rule would "not have a significant economic impact on a substantial number of small entities." 2017 Car Rule, 76 Fed. Reg. at 75,161. EPA's reliance on Mid-Tex. Elec. Coop v. FERC, 773 F.2d 327 (D.C. Cir. 1985), and Cement Kiln Recycling Coalition v. EPA, 255 F.3d 855 (D.C. Cir. 2001), is misplaced because the 2017 Car Rule's impact on small businesses is not merely an indirect effect of the 2017 Car Rule's impact on regulated entities. Instead, as a result of the triggering effect of the 2017 Car Rule for stationary source permitting requirements, many small businesses will be regulated directly by EPA as a result of this rule. EPA is required to analyze these impacts in accordance with the RFA before issuing a rule. Instead, EPA asserts that any impact on small businesses should be attributed to express statutory requirements in the CAA or previously promulgated EPA regulations. 76 Fed. Reg. at 75,162 n.597. EPA ignores the fact that once the Car Rule and Truck Rule are vacated, the 2017 Car Rule will be sole "trigger" for EPA's GHG permitting requirements for stationary sources. [EPA-HQ-OAR-2010-0799-9509-A1, p. 9]
- Under the Unfunded Mandates Reform Act (UMRA) 2 U.S.C. § 1535, EPA must consider regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. Here, EPA's sole proclaimed goal is regulating emissions from vehicles, yet it has ignored apparent alternatives that would fully realize that goal while avoiding the heavy burdens on stationary sources. See Section I supra. [EPA-HQ-OAR-2010-0799-9509-A1, p. 10]

- Similarly, under the Paperwork Reduction Act (PRA), 44 U.S.C. §§ 3501-3521, EPA must seek approval from the Office of Management and Budget before creating rules that will involve information collection requirements. EPA never submitted a request for approval of the massive information collection requirements that the 2017 Car Rule could impose on stationary sources newly subject to permitting requirements. 76 Fed. Reg. at 75,160. [EPA-HQ-OAR-2010-0799-9509-A1, p. 10]
- EPA has also failed to perform the economic impact assessment required by CAA § 317, 42 U.S.C. § 7617, which, by law, must contain an analysis of a proposed rule's compliance costs, inflationary or recessionary effects, competitive effects, effect on consumers, and impact on energy use. [EPA-HQ-OAR-2010-0799-9509-A1, p. 10]
- Finally, the proposed rule fails to satisfy Executive Order 13211's requirement that EPA conduct an analysis of its actions' impact on energy supply, distribution, and use, 76 Fed. Reg. at 75,163, as well as Executive Order 12898's requirement that EPA identify and address disproportionate effects of its actions on minority and low-income populations in the United States, id. Triggering stationary source permitting requirements for GHGs will undoubtedly raise energy prices, thereby harming low-income populations that are most vulnerable to high energy prices. EPA failed to consider these impacts in proposing its rule. [EPA-HQ-OAR-2010-0799-9509-A1, p. 10]

Thus, in the proposed rule, EPA has "entirely failed to consider an important aspect of the problem," making the proposed GHG Truck Rule arbitrary and capricious. Motor Vehicle Mfrs., 463 U.S. at 43. [EPA-HQ-OAR-2010-0799-9509-A1, p. 10]

Response:

These incorrect assertions were rejected in their entirety by the D.C. Circuit in Coalition for Responsible Regulation v. EPA, No. 09-1322 (D.C. Cir. June 26, 2012) slip op. pp. 44-45. The commenter is equally mistaken in this rulemaking. Thus, EPA has prepared an RIA which assesses, among other things, costs of the vehicle program, impacts and assessment of standards both more and less stringent than those adopted, vehicle sales impacts, employment impacts in the light duty vehicle sector, consumer lifetime savings on new vehicle purchases, energy use impacts, and small business impacts. Substantially the same analysis was available as part of the record for the proposed rule. This analysis fully satisfies the requirement in CAA section 317. The commenter is equally incorrect regarding requirements of the Paperwork Reduction Act. See 76 FR 75160 ("[t]he information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget … under the Paperwork Reduction Act… The Information Collection Request …document prepared by EPA has been assigned EPA ICR number 0783.61"). The remaining assertions are predicated on the incorrect assumption that EPA must account for stationary source burdens flowing from this rule, an argument rejected in its entirety by the D.C. Circuit in Coalition for Responsible Regulation v. EPA. In any case, this rule has no such effect on stationary sources, since greenhouse gases are already "regulated pollutants" under the Act by virtue of the MYs 2012-2016 rule, as well as other regulatory actions which control emissions of GHGs.

Organization: Center for Biological Diversity

A. The Agencies Misapprehend the Nature and Relative Weight of the Factors They Must Consider Under EPCA and EISA

In enacting EPCA in 1975, shortly after the energy crisis of 1973, Congress observed that "[t]e fundamental reality is that this nation has entered a new era in which energy resources previously abundant, will remain in short supply retarding our economic growth and necessitating an alteration in our life's habitats and expectations."7 Among the goals of EPCA are to "'decrease dependence on foreign imports, enhance national security [and to] achieve the efficient utilization of scarce resources . . .'"8 The fundamental purpose of EPCA, however, is energy conservation.9 [EPA-HQ-OAR-2010-0799-9479-A1, p. 3]

In furtherance of the overarching goal of energy conservation, NHTSA must set fuel economy standards at "the maximum feasible average fuel economy level that the Secretary decides the manufacturers can achieve in that model year." 10 The statute provides that "[w]hen deciding maximum feasible average fuel economy under this section, the Secretary . . . shall consider technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need for the United States to conserve cannot balance them in a manner that is contrary to fuel conservation: NHTSA "cannot set fuel economy standards that are contrary to Congress' purpose in enacting the EPCA – energy conservation."12 Further, NHTSA cannot give so much weight to any factor, including consumer choice or demand, that the goal of fuel conservation is undercut: "NHTSA may consider consumer demand, but 'it would clearly be impermissible for NHTSA to rely on consumer demand to such an extent that it ignored the overarching goal of fuel conservation.'"13 The Agencies also cannot act arbitrarily or capriciously; cannot advance conclusions unsupported by the evidence; if they conduct cost-benefit analyses, they may not assign values of zero to benefits that can be ascertained within a range; and they cannot bias their cost-benefit analysis. [EPA-HQ-OAR-2010-0799-9479-A1, pp. 3-4]

I. The Agencies must Complete an Endangered Species Act Section 7 Consultation to Ensure that their Action will not Jeopardize or Adversely Modify the Critical Habitat of any Species Listed as "Threatened" or "Endangered"

To our knowledge the Agencies have not initiated consultation with the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries Service under Section 7 of the federal Endangered Species Act to ensure that this action will not jeopardize or adversely modify the critical habitat of any species listed as "threatened" or "endangered." [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

Congress enacted the Endangered Species Act ("ESA") to conserve endangered and threatened species and the ecosystems upon which they depend.111 The Supreme Court's review of the ESA's "language, history, and structure" convinced the Court "beyond a doubt" that "Congress intended endangered species to be afforded the highest of priorities."112 As the Court found, "the plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost."113 Species are added to the lists of endangered and threatened species by the U.S. Fish and Wildlife Service (with jurisdiction over most terrestrial and freshwater species) and the National Marine Fisheries Service (with jurisdiction over most marine species) (collectively, the "Services"). A species is "endangered" if it "is in danger of extinction throughout all or a significant portion of its range." 114 A species is "threatened" if it "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."115 Once a species is listed under the ESA, Section 7 requires all federal agencies to "insure" that their actions neither "jeopardize the continued existence" of any listed species nor "result in the destruction or adverse modification" of its "critical habitat."116 In addition, the "take" of listed species is generally prohibited.117 "Take" means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."118 The Services may, however, permit "incidental" take on a case-by-case basis if it finds, among other things, that such take will be minimized and mitigated and that such take will not "appreciably reduce the likelihood of survival and recovery of the species."119 [EPA-HQ-OAR-2010-0799-9479-A1, pp. 25-26]

Section 7 consultation is required for "any action [that] may affect listed species or critical habitat."120 Agency "action" is defined in the ESA's implementing regulations to include "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air."121 This regulatory definition of "action" clearly encompasses the Agencies' rulemaking, since the emissions from the regulated vehicles unquestionably will cause "modification to the land, water, or air." The U.S. Fish and Wildlife Service's and National Marine Fisheries Service's Consultation Handbook, Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act (March 1998,) explains the above terms and definitions. There can also be no question that the enormous volume of direct, indirect, and cumulative emissions from the regulated vehicles "may affect" listed species, and therefore the Agencies must consult. [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

The rulemaking will impact species listed as threatened and endangered in several ways, yet the Agencies have failed to initiate the required Section 7 consultations with the Services on its impact. If the Agencies fail to initiate and complete the required Section 7 consultations on the rulemaking, they may be held liable for take of listed species caused by the impacts of their action, including increased greenhouse gas emissions and other emissions such as NO_x. On May 15, 2008, the U.S. Fish and Wildlife Service listed the polar bear as a threatened species throughout is range due to global warming. 122 The Agencies must consult on the impact of the rulemaking on the polar bear. [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

On May 9, 2006, the National Marine Fisheries Service listed the staghorn and elkhorn corals as threatened due in part to increasing ocean temperature and ocean acidification due to anthropogenic greenhouse emissions. 123 The Agencies must consult on the impact of the rulemaking on these coral species. The Agencies must also consult on the impact of the rulemaking on the polar bear's and the corals' critical habitat, once such habitat is designated. [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

Global warming was cited by the U.S. Fish and Wildlife Service in its critical habitat rulemakings for the Quino Checkerspot and Bay Checkerspot butterflies.124 The Agencies must consult on the impact of the rulemaking on these species and their critical habitat as well. [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

The Agencies must not limit their consultation, however, to species like the polar bear, corals, and checkerspot butterflies for which anthropogenic greenhouse emissions were cited as a reason for listing or as an impact in the listing or critical habitat rules. Numerous species are affected by climate change as reflected in the recovery plans for those species and other documents. [EPA-HQ-OAR-2010-0799-9479-A1, p. 27]

There at least 124 listed species for which a recovery plan has been adopted that specifically identifies climate change or a projected impact of climate change as a direct or indirect threat to the species, as a critical impact to be mitigated, as a critical issue to be monitored, and/or as a component of the recovery criteria.125 These findings constitute clear evidence that the Agencies' rulemaking "may affect" these species, and that they must consult on the impact of this action on all listed species which may be affected. [EPA-HQ-OAR-2010-0799-9479-A1, p. 27]

The rulemaking will impact listed species in ways beyond global warming and ocean acidification. For example, vehicles are a primary source of excess nitrogen in the environment. Excess nitrogen contributes to major environmental problems including reduced water quality, eutrophication of estuaries, nitrate-induced toxic effects on freshwater biota, changes in plant community composition, disruptions in nutrient cycling, and increased emissions from soil of nitrogenous greenhouse gases.126 Nitrogen deposition therefore impacts species listed under the Endangered Species Act in a number of ways. [EPA-HQ-OAR-2010-0799-9479-A1, p. 27]

The direct, indirect, and cumulative impacts of setting fuel economy standards for all passenger vehicles and light trucks nationally are extraordinarily significant, and therefore a large number of species may be implicated. Where, as here, the Agencies' rulemaking is national in scope, they should conduct a nationally focused consultation. The agencies must not attempt to use the large scale of the rulemaking as an excuse for ignoring its environmental review duties; instead, the scope of the action only makes it more important to thoroughly review its impacts under all applicable laws. Nor can the mere fact that a large geographical area or large number of species will be affected be used as an excuse for inaction.127 If anything, a nationally focused consultation will provide the opportunity to most efficiently analyze the impact of the rulemaking on species and groups of species. [EPA-HQ-OAR-2010-0799-9479-A1, p. 27]

---

7 H.R. Rep. No. 94-340 at 1-3 (1975), as reprinted in 1975 U.S.C.C.A.N. 1762, 1763. [EPA-HQ-OAR-2010-0799-9479-A1, p. 3]

8 Center for Biological Diversity v. NHTSA, 538 F.3d 1172, 1182 (9th Cir. 2008) ("CBD v. NHTSA") (quoting S.Rep. No. 94-516 (1975) (Conf. Rep.), as reprinted in 1975 U.S.C.C.A.N. 1956, 1957). [EPA-HQ-OAR-2010-0799-9479-A1, p. 3]

9 Id. at 1195. [EPA-HQ-OAR-2010-0799-9479-A1, p. 3]

10 49 U.S.C. § 32902(a)(emphasis added). [EPA-HQ-OAR-2010-0799-9479-A1, p. 3]

11 Id. § 32902(f). [EPA-HQ-OAR-2010-0799-9479-A1, p. 4]

12 CBD v. NHTSA, 538 F.3d at 1197. [EPA-HQ-OAR-2010-0799-9479-A1, p. 4]

13 Id. at 1195 (quoting Center for Auto Safety v. NHTSA, 793 F.2d 1322, 1338 (D.C. Cir. 1986). [EPA-HQ-OAR-2010-0799-9479-A1, p. 4]

111 16 U.S.C. § 1531(b). [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

112 Tennessee Valley Authority v. Hill, 437 U.S. 153, 174 (1978). [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

113 Id. at 184. [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

114 16 U.S.C. § 1532(6). [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

115 16 U.S.C. § 1532(20). [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

116 Id. at § 1536(a)(2). [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

117 Id. at § 1538(a); 50 C.F.R. § 17.31(a). [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

118 16 U.S.C. § 1532(19). [EPA-HQ-OAR-2010-0799-9479-A1, p. 25]

119 Id. at § 1539(a). [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

120 50 C.F.R. § 402.14. [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

121 50 C.F.R. § 402.02. [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

122 Endangered and Threatened Wildlife and Plants, Determination of Threatened Status for the Polar Bear (Ursus maritimus) Throughout its Range, 73 Fed. Reg. 28212-28303 (May 15, 2008). [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

123 71 Fed. Reg. 26852 [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

124 See 73 Fed. Reg. 3328-3373 and 72 Fed. Reg. 48178-48218. [EPA-HQ-OAR-2010-0799-9479-A1, p. 26]

125 Anthony Povilitis and Kieran Suckling, Addressing Climate Change Threats to Endangered Species in U.S. Recovery Plans, Conservation Biology, Vol. 24, No 2, 372-376 (2010). [EPA-HQ-OAR-2010-0799-9479-A1, p. 27]

126 Fenn M.E. et al., Ecological Effect of Nitrogen Deposition in the Western United States, Bioscience 53:404 (2003), available at www.fs.fed.us/psw/publications/fenn/psw_2003_fenn012.pdf. [EPA-HQ-OAR-2010-0799-9479-A1, p. 27]

127 See, e.g., Wash. Toxics Coalition v. EPA, 413 F.3d 1024 (9th Cir. Wash. 2005) (upholding order requiring the EPA to consult on the impact of 54 pesticide ingredients on 25 species of fish.). [EPA-HQ-OAR-2010-0799-9479-A1, p. 27]

Response:

Section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) and/or the U.S. Fish and Wildlife Service (FWS, and, with NOAA Fisheries, the Services), to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of federally-listed threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat of such species. 16 U.S.C. § 1536(a)(2). Under the Services' relevant implementing regulations, consultation is required for actions that "may affect" listed species or designated critical habitat. 50 CFR § 402.14. Consultation is not required where the action has "no effect" on such listed species or critical habitat. Under this standard, it is the federal agency taking the action that evaluates the action and determines whether consultation is required. See 51 FR 19926, 19949 (June 3, 1986). The effects of a federal action are defined by regulation to include both the direct and indirect effects of the action on listed species or designated critical habitat. 50 CFR § 402.02. Indirect effects are those that are caused by the action and are later in time, but still are reasonably certain to occur. *Id.*; *Cf.*, 51 FR at 19932-19933 (discussing "reasonably certain to occur" in the context of cumulative effects analysis and noting that only matters that are likely to occur – and not speculative matters – are included within the standard).

Pursuant to Section 7(a)(2) of the ESA, EPA has carefully considered the effects of its MYs 2017-2025 light duty motor vehicle rule and has reviewed applicable ESA regulations, case law, and guidance to determine what, if any, impact there may be to listed species or designated critical habitat. EPA has considered issues relating to emissions of carbon dioxide (CO_2) and other greenhouse gases (GHGs) as well as issues relating to emissions of non-GHG air pollutants. EPA has also coordinated with NHTSA to assess ESA requirements in connection with EPA's rulemaking and NHTSA's related CAFE Standards. EPA notes that NHTSA's response to the ESA comment submitted on the NPRM is found in Chapter 9 (pages 9-99 through 9-102) of its Final EIS. EPA agrees with the reasoning in NHTSA's response as applied to EPA's rulemaking. Based on EPA's assessment, EPA has determined that the agency's rulemaking action, which will generally result in emissions reductions from what would otherwise occur in the absence of this rule, does not require consultation with the Services under Section 7(a)(2) of the ESA.

EPA notes that similar issues regarding applicability of ESA Section 7(a)(2) consultation requirements were raised by the same commenter in connection with EPA's MY 2012-2016 light duty motor vehicle rulemaking. In that context, EPA addressed in detail issues regarding ESA Section 7(a)(2) in its Response To Comment document at pages 4-94 through 4-103 (the MY

2012-2016 ESA Response). EPA believes that the same basic rationale as set forth in that response also applies to the current comment and rulemaking, and EPA adopts and incorporates that prior response here.

In particular, EPA notes that its rulemaking will result in GHG emissions reductions that would be expected to have beneficial effects with respect to global climate change and associated impacts. The commenter appears to generally misunderstand the effect of the rule and to attribute the entire volume of emissions from the regulated sector to EPA's action. To the contrary, the rule will generally reduce the impacts of climate change and will, therefore, be expected to have a beneficial effect with respect to global climate change. EPA believes, however, that any potential for a specific impact to particular listed species and their habitats associated with the emission changes achieved by this rulemaking is too uncertain and remote to trigger the threshold for ESA Section 7(a)(2) consultation.

As detailed in the MY 2012-2016 ESA Response, EPA's conclusion that ESA Section 7(a)(2) consultation is not required relies on the significant legal and technical analysis undertaken by FWS, the Department of the Interior (DOI), and EPA regarding GHG emissions and the ESA. As explained in that response, FWS and DOI have – in the context of various documents relating to the listing of the polar bear as a threatened species – determined that it is not possible, for ESA purposes, to trace a causal link between a single stationary source's GHG emissions and any reasonably certain effect on a specific species in a specific habitat.[93] Although EPA's rule involves GHG reductions from mobile sources rather than emissions from a single stationary source, EPA believes that the analysis regarding causation is relevant here. EPA agrees that there must be a causal connection between a federal action and a potential effect on listed species or critical habitat for Section 7(a)(2) consultation requirements to apply, and that the potential effect must be reasonably certain to occur.

In addition, as EPA did in the MY 2012-2016 ESA Response, EPA has also considered the specific GHG emissions reductions achieved by the current rule in light of any potential impacts on listed species or designated critical habitat. In the MY 2012-2016 ESA Response, EPA explained that it had previously attempted to analyze the impacts on temperature and tropical ocean pH of GHG emissions from a single large stationary source. In that prior analysis, EPA concluded that any such potential effects were too remote to trigger ESA Section 7(a)(2) consultation requirements. In the MY 2012-2016 ESA Response, EPA extended that analysis to the magnitude of GHG emission changes resulting from implementation of that rule and for similar reasons concluded that ESA consultation was not required. EPA has also considered the magnitude of GHG emission changes achieved by the current rule and finds that for the same reasons described in the MY 2012-2016 ESA Response, any potential effects attributable to such

[93] One of the principal relevant documents from the polar bear listing is FWS' Final Special Rule for the Polar Bear (73 FR 76249 (Dec. 16, 2008)). EPA is aware that the Federal District Court for the District of Columbia has found that the Final Special Rule did not comply with requirements of the National Environmental Policy Act (NEPA). See *In re Polar Bear Endangered Species Act Listing and § 4(d) Rule Litigation*, 818 F. Supp.2d 214 (D.D.C. 2011). Importantly, however, the District Court did uphold FWS' approach regarding ESA Section 7(a)(2), which supports the relevant analytical framework addressed in EPA's MY 2012-2016 ESA Response and adopted as part of the current response set forth here.

changes are too remote to trigger ESA consultation. In particular, the EPA technical analysis for MY 2017-2025 concludes that, relative to the reference case, by 2100 projected atmospheric CO_2 concentrations are estimated to be reduced by 3.21 to 3.58 part per million by volume (ppmv), global mean temperature is estimated to be reduced by 0.0074 to 0.0176°C, and sea-level rise is projected to be reduced by approximately 0.071-0.159 cm, based on a range of climate sensitivities. The analysis also demonstrates that ocean pH will increase by 0.0017 pH units by 2100 relative to the reference case (ie, reduced acidification). As noted above, EPA believes that these results fit within the analytical framework of EPA's prior ESA/GHG assessments as described in the MY 2012-2016 ESA Response.

In the MY 2012-2016 ESA Response, EPA also considered non-GHG air pollutant emissions and concluded – for similar reasons as explained in relation to GHG emission changes – that the changes in emissions of such pollutants attributable to that rule did not trigger ESA Section 7(a)(2) consultation. EPA has also considered changes in non-GHG pollutant emissions associated with the current rulemaking. The following chart provides EPA's estimated changes for each of the non-GHG pollutants.

Annual Non-GHG Pollutant Emission Impacts of Program (short tons)

	CY 2020		CY 2030	
Pollutant	Impacts (Short Tons)	% of Total US Inventory	Impacts (Short Tons)	% of Total US Inventory
VOC	-11,712	-0.1%	-123,070	-1.0%
CO	14,164	0.0%	224,875	0.4%
NO_X	-904	0.0%	-6,509	-0.1%
PM2.5	-136	0.0%	-1,254	0.0%
SO_X	-1,270	0.0%	-13,377	-0.2%
1,3-Butadiene	1	0.0%	25	0.2%
Acetaldehyde	3	0.0%	57	0.1%
Acrolein	0	0.0%	2	0.0%
Benzene	-16	0.0%	-101	0.0%
Formaldehyde	-7	0.0%	-43	0.0%

Source: RIA Table 4.3-19

Consistent with the MY 2012-2016 ESA Response, EPA notes that the modeling tools available for EPA's regulatory analysis of the non-GHG pollutants are not designed to trace fluctuations in ambient concentration levels to potential impacts on particular species. EPA believes that such models do not, therefore, attribute any biological response or impact on listed species to the ambient concentration changes with the degree of reasonable certainty required under the ESA. In addition, EPA is unaware of information identifying any effects on listed species from the small fluctuations in amounts of non-GHG pollutants indicated in the chart. For the same reasons identified in the MY 2012-2016 ESA Response, EPA thus concludes that ESA consultation is not required with respect to the non-GHG emission changes attributable to the current light duty motor vehicle rule.

For additional discussion of EPA's analysis regarding the light duty motor vehicle rule and ESA Section 7(a)(2) requirements, see the MY 2012-2016 ESA Response.

Organization: Competitive Enterprise Institute (CEI)

III. EPA/NHTSA: Denying Plain Facts They Must Know to be True

At a recent hearing before a House oversight panel, three Obama Administration witnesses — NHTSA Administrator David Strickland, EPA Assistant Air Administrator Gina McCarthy, and EPA Transportation and Air Quality Director Margo Oge – denied under oath that motor vehicle GHG emission standards are "related to" fuel economy standards.10 In so doing, they denied plain facts they must know to be true. They lied to Congress. [EPA-HQ-OAR-2010-0799-9552-A1, p. 3]

House Government Oversight and Reform Chairman Darrell Issa put it more diplomatically: "Your statements under oath misrepresented the relationship between regulating greenhouse gases and regulating fuel economy." By "obstinately insisting" that regulating greenhouse gases and fuel economy are "separate and unrelated endeavors," he said, the Administration officials "impede the Committee's important oversight work." [EPA-HQ-OAR-2010-0799-9552-A1, p. 3]

Why did they "misrepresent" and "impede"? Had they answered truthfully, they would have to admit that California's greenhouse gas motor vehicle emissions law, AB 1493, which EPA approved in June 2009,11 violates EPCA's express preemption of state laws or regulations "related to" fuel economy.12 The officials would also have to admit that EPA is effectively regulating fuel economy, a function outside the scope of its statutory authority. [EPA-HQ-OAR-2010-0799-9552-A1, p. 3]

IV. Power Grab

The falsehood that GHG emission standards are not related to fuel economy standards does more than mask EPA and CARB's poaching of NHTSA's statutory authority. It also protects EPA's efforts to legislate climate policy under the guise of implementing the CAA. [EPA-HQ-OAR-2010-0799-9552-A1, p. 3]

To begin with, the falsehood facilitated a regulatory extortion strategy enabling the Obama Administration to convert the auto industry from opponent to ally in any congressional debate on EPA's greenhouse gas regulations. [EPA-HQ-OAR-2010-0799-9552-A1, p. 3]

In February 2009, EPA Administrator Jackson decided to reconsider13 Bush EPA Administrator Stephen Johnson's denial of California's request for a waiver to implement AB 1493.14 Because GHG emissions standards implicitly regulate fuel economy, because the waiver would allow other states to follow suit, and because auto makers would have to reshuffle the mix of vehicles sold in each "California" state to achieve the same average fuel economy, Jackson confronted the financially-distressed auto industry with the prospect of a market-balkanizing fuel-economy "patchwork."15 [EPA-HQ-OAR-2010-0799-9552-A1, p. 3]

Then, in May 2009, in backdoor negotiations conducted under a vow of silence ("We put nothing in writing, ever," CARB Chairman Mary Nichols told the New York Times),16 the White House offered to protect auto makers from the patchwork threat if – but only if – they agreed to support EPA and CARB's newfound careers as GHG/fuel economy regulators. [EPA-HQ-OAR-2010-0799-9552-A1, p. 3]

Specifically, under what President Obama dubbed the "Historic Agreement,"17 California and other states agreed18 to deem compliance with EPA's GHG standards as compliance with their own in return for auto makers' pledge19 not to challenge either the Tailpipe Rule or the California waiver. The Administration may also have tied its offer of bailout money to automakers' acceptance of the 'triplification' of fuel economy regulation.20 Outsiders may never know the details, because participants, in apparent defiance of the Presidential Records Act,21 kept no minutes or notes of the meetings. [EPA-HQ-OAR-2010-0799-9552-A1, p. 4]

The political payoff for EPA and CARB was not long in coming. In 2010, Alaska Sen. Lisa Murkowski introduced a resolution22 to overturn EPA's greenhouse gas Endangerment Rule,23 the prerequisite for the Tailpipe Rule and all other EPA greenhouse gas regulations. The auto industry lobbied against the resolution,24 warning that it would undo the Historic Agreement and, thus, expose auto makers to a "multitude" of conflicting state and federal standards.25 [EPA-HQ-OAR-2010-0799-9552-A1, p. 4]

Of course, the threat of a patchwork exists only because Jackson, disregarding the EPCA preemption, granted the waiver in the first place. [EPA-HQ-OAR-2010-0799-9552-A1, p. 4]

EPA then parlayed its new role as de-facto fuel economy regulator into a mandate to regulate GHG emissions throughout the economy. The Tailpipe Rule – at least as EPA reads the CAA26 – compels the agency to regulate GHGs from "major emitting facilities." EPA is now applying CAA preconstruction and operating permit requirements to large CO_2 emitters such as coal-fired power plants, petroleum refineries, cement production facilities, steel mills, and pulp and paper factories.27 [EPA-HQ-OAR-2010-0799-9552-A1, p. 4]

Given these precedents, it was inevitable that EPA would settle environmental lawsuits by consenting to develop GHG "performance standards" for power plants28 and refineries,29 with GHG performance standards for other industrial categories sure to follow. In time, litigants will likely induce EPA to establish quasi-fuel economy standards for marine vessels, aircraft, and non-road engines,30 even though no agency sets such standards under any existing statute. [EPA-HQ-OAR-2010-0799-9552-A1, p. 4]

Because the Endangerment Rule identifies the "elevated concentration" of GHGs as the source of endangerment,31 EPA has logically committed itself to develop national ambient air quality standards (NAAQS) for GHGs set below current atmospheric concentrations.32 In an August

2010 brief to the Supreme Court in American Electric Power v. State of Connecticut, the Department of Justice favorably cited the NAAQS program as a potential regulatory tool displacing federal common law tort action against GHG emitters.33 [EPA-HQ-OAR-2010-0799-9552-A1, p. 4]

[See footnote list for this comment on pp. 5-6 of Docket number EPA-HQ-OAR-2010-0799-9552-A1]

Response:

Most of this comment again reflects reasoning repudiated by the D.C. Circuit in Coalition for Responsible Regulation v. EPA. In addition, the stationary source consequences that the commenter decries occur essentially by operation of statute, not because of EPA action. Coalition for Responsible Regulation v. EPA, no. 09-1322 (D.C. Cir. June 26, 2012) slip op. pp. 40-41, 54-59.

Organization: Pacific Legal Foundation (PLF)

We address two issues regarding the Proposed Regulations. First, the Proposed Regulations must be submitted to EPA's Science Advisory Board ("SAB") for review during the public comment period, pursuant to 42 U.S.C. § 4365. In addition, the preamble to the final regulations should set forth in detail the time and circumstances of EPA's submittal of the Proposed Regulations to SAB, as well as any comments provided by SAB, whether EPA made changes to the Proposed Regulations in response to such comments, and why or why not. [Refer to pp. 2-4 of Docket number EPA-HQ-OAR-2010-0799-8108-A1 for detailed information] [EPA-HQ-OAR-2010-0799-8108-A1, p. 2]

Second, EPA must comply with the special rulemaking provisions of 42 U.S.C. § 7607(d) in connection with the promulgation of the Proposed Regulations. Among other things, that subsection of the Clean Air Act sets forth detailed requirements for EPA's "promulgation ... of regulations under section 202" of the Clean Air Act. Because EPA is promulgating the regulations under section 202 (a) (1) of the Clean Air Act, the regulations are subject to the special rulemaking requirements of 42 U.S.C. § 7607(d). EPA must document in detail in the preamble to the final LDVR II regulations the precise manner in which it has complied (or not complied) with such requirements. The remainder of this letter sets forth in detail the reasons EPA must perform the two actions summarized above. [Refer to pp. 4-7 of Docket number EPA-HQ-OAR-2010-0799-8108-A1 for detailed information] [EPA-HQ-OAR-2010-0799-8108-A1, p. 2]

Response:

The commenter is factually mistaken. In fact, EPA submitted the proposed rule to the SAB at its meeting of March 23, 2012. The SAB declined to consider the proposed rule. Surprisingly, given the commenter's professed interest in the matter, it failed to submit either written or oral comments to the SAB, even though notice of the meeting was published in the

Federal register and other entities submitted comments on matters discussed at the meeting. See 77 FR 12579, 12580 (March 1, 2012). EPA-HQ-OAR-2010-0799-11793.

In addition, the commenter fails to demonstrate that 42 USC. 4365 ©(1) is applicable. That provision applies only when EPA submits documents to other agencies "for formal review and comment." The light duty vehicle GHG rule implements section 202 (a) of the Clean Air Act. That provision contains no requirement that implementing regulations be submitted to other federal agencies for formal review and comment, nor did EPA do so. EPA submitted the draft of the proposed rule to the Office of Management and Budget for informal review, pursuant to Executive Order 12866, but this is not the type of formal review to which section 4365 (c)(1) speaks. See Coalition for Responsible Regulation v. EPA, No. 09-1322 (D.C. Cir. June 26, 2012) slip op. pp. 35-36 (noting this distinction).

Finally, EPA agrees that the procedures set out in section 307 (d) apply to this rulemaking, and EPA has followed all of those procedures in promulgating the proposed and final rules setting GHG emission standards for MYs 2017-2025 light duty motor vehicles. The commenter does not allege otherwise. Rather, the commenter maintains (comment pp. 6-7) that EPA must document in the preamble compliance with each of the procedural requirements of section 307 (d). This argument lacks any statutory foundation. The commenter mistakenly cites section 307 (d)(3)(C) as support. This provision states that a proposed rule shall "set forth … any pertinent finding, recommendations, and comments of the Scientific Review Committee established under section 109 (d)". Section 109 (d) applies exclusively to establishment of National Ambient Air Quality Standards, so section 307 (d)(3)(C) is inapplicable here. EPA in fact established a docket for the proposed and final rule (see 76 FR 74855-56), announced and held public hearings (76 FR at 74857), set forth in the preamble, draft TSD and DRIA the basis and purposes of the proposed rule, etc. The commenter is consequently mistaken as a matter of both fact and law.

Organization: RVIA

Cost considerations per Executive Order # 13563 [EPA-HQ-OAR-2010-0799-9550-A2, p.3]

In accordance with Section 1(b) of Executive Order 13563 (Improving *Regulations and Regulatory Review*), when issuing new regulations, agencies shall tailor their regulations to impose the least burden on society, consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations." In proposing the 2017-2025 GHG and CAFÉ standards for light duty vehicles, RVIA believes that EPA and NHTSA have failed to fully comply with this directive. While the agencies have informed the public of what the cost impact of the proposed standards are projected to be, they have not informed the public of the cumulative costs of their regulations. When informing the public of the cost of the impact, we believe that, as a matter of good public policy, the public should be informed that the vehicle is going to realize additional price increases due to other EPA and NHTSA regulations that will be implemented during these same model years. NHTSA rules that will likely be implemented in the future and thus add additional cost to new vehicles include the following: [EPA-HQ-OAR-2010-0799-9550-A2, p.3]

1. FMVSS 111 backup camera [EPA-HQ-OAR-2010-0799-9550-A2, p.3]

2. FMVSS 124 accelerator control update [EPA-HQ-OAR-2010-0799-9550-A2, p.3]

3. FMVSS 214 side impact upgrade [EPA-HQ-OAR-2010-0799-9550-A2, p.3]

4. FMVSS 216 roof crush upgrade [EPA-HQ-OAR-2010-0799-9550-A2, p.3]

5. FMVSS 226 ejection mitigation [EPA-HQ-OAR-2010-0799-9550-A2, p.3]

6. 49 CFR Part 563 Event Data Recorder mandate [EPA-HQ-OAR-2010-0799-9550-A2, p.3]

7. Pedestrian Safety Enhancement Act audible alert [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

8. Pedestrian safety Global Technical Regulation [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

9. Brake override mandate [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

For the above rules that have already been finalized but not yet fully implemented, NHTSA has projected that the costs per rule could be as much as: [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

$299/vehicle for the ejection mitigation rule [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

$243/vehicle for the side impact rule [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

$203/vehicle for the backup camera rule [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

$114/vehicle for the roof crush rule [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

These four rules alone cumulatively could increase the price of a new vehicle by $859 (eight hundred and fifty-nine dollars). [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

EPA (along with CARB) will also introduce new requirements like the Tier 3 emissions standards. If the cost of implementing Tier 3 standards compares to the cost of implementing Tier 2 emissions standards, one can expect the average price of a passenger car to increase by $100 and the average price of a light truck to increase by $200. [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

Just the five rules mentioned here could potentially increase the cost of a new light vehicle by another $1,000 (one-thousand dollars). Consumers have a right to know the cumulative cost impact of the EPA/NHTSA regulations. RVIA therefore recommends that the agencies take these cumulative costs into consideration when setting future standards and that you inform the public of the cumulative cost impacts of EPA/NHTSA regulations on new vehicle prices. [EPA-HQ-OAR-2010-0799-9550-A2, p.4]

With regard to all light vehicles, EPA and NHTSA should take the cumulative costs of its regulations into consideration when setting future standards and inform the public of the impact on new car prices. In this rulemaking, EPA and NHTSA did not fully consider the cumulative costs of its regulations on new car prices. We have listed several EPA and NHTSA rules that were not discussed in the NPRM that will drive up new car prices by possibly another $1,000. [EPA-HQ-OAR-2010-0799-9550-A2, p.5]

Response:

EPA believes it has **f**ollowed both Executive Orders 12866 and 13563 both in the proposal and in this final rulemaking. Specifically, Executive Order 13563 was published January 21, 2011 (76 FR 3821) to, "supplement and reaffirm the principles, structures and definitions of government contemporary regulatory review that were established in Executive Order 12866 of September 30 1993."

In responding to these executive orders, EPA has provided detailed costs analysis of this action in both the Preamble and Final Regulatory Impact Analysis (FRIA). EPA submitted this action to the Office of Management and Budget (OMB) as required under these Executive Orders for review and any changes made in response to OMB recommendations have been documented in the docket for this action as required by CAA section 307(d)(4)(B)(ii). **.**

Specifically, section III. H of the preamble provides an in-depth discussion of the estimated costs, economic and other impacts of this final rule. This is supplemented by further detailed discussion in the FRIA, Chapter 3. Regarding the treatment of cumulative costs from previous light-duty vehicle rule**s**, EPA for this final rule, has estimated the 2025MY reference case costs (i.e, the cost to meet the 2016 standards in the 2025MY) at $719 (see RIA Table 3.6-1). We have also estimated 2025MY control case costs (i.e., the cost to meet the 2025 standards in the 2025MY) at $1836. The total cost of these rules would then be $2555. To properly add the costs, one needs to use the cost of the 2016 standards in the 2025MY as we have done. With regard to Tier 2 costs which became effective in 2004MY EPA has not specially highlighted those costs but they are part of the baseline for the 2025 reference case costs. Given that EPA has not even proposed Tier 3 rules, it would be premature (at best) and merely speculative (at worst) to estimate those costs here. Neither executive order addresses, or contemplates including costs of pre-proposal nascent regulatory potential actions.

21. Comments Regarding Proposed Regulatory Text

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Honda Motor Co., Inc.
Association of Global Automakers, Inc. (Global Automakers)
Borg Warner, Inc.
Ferrari
Fisker Automotive, Inc.
Ford Motor Company
Motor & Equipment Manufacturers Association (MEMA)
Roush Industries, Inc.
Toyota Motor North America

Organization: Alliance of Automobile Manufacturers

Proportion of Recovered Braking Energy for Hybrid Electric Vehicles [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

The following comments address EPA's proposed changes to 40 C.F.R. §600.116-12(c) for determining the proportion of recovered braking energy for hybrid electric vehicles. [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

In 40 C.F.R. §600.116-12(c)(1)(i)(A) and (B), it is unclear whether road load power and applied deceleration power are to be calculated from scheduled speed or measured speed. We recommend that Vmph, V and Vt+1 be defined as "measured velocity in miles/hour, rounded to the nearest 0.01 miles/hour…" [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

In 40 C.F.R. §600.116-12(c)(1)(C), EPA proposes to determine braking power by the following equation: [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

Pbrake = Paccel – Proadload [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

We recommend that the equation be changed to the following: [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

Pbrake = Paccel + Proadload and if Pbrake >0, set Pbrake = 0 [EPA-HQ-OAR-2010-0799-9487-A1, p.88]

The Proadload should decrease the magnitude of the Pbrake term. As it is currently written, the magnitude of Pbrake is not decreased by Proadload during deceleration. If Pbrake isn't decreased by Proadload, the Emax equation would assume that the roadload force could be recovered by regenerative braking, and this would cause the Emax calculation to give a higher value than is possible (thus lowering the eventual Energy Recovered %). [EPA-HQ-OAR-2010-0799-9487-A1, p.89]

As can be seen in the following chart, the proposed equation would indicate that roadload during steady cruising would be able to be recaptured as regeneration (red line). The green line is Emax when you replace the '-' sign with a '+' sign in the Pbrake equation and revise the Pbrake = 0 criteria. [EPA-HQ-OAR-2010-0799-9487-A1, p.89] [For the chart please refer to EPA-HQ-OAR-2010-0799-9487-A1, p.89]

Therefore, it would be more appropriate if the equation were written as Pbrake = Paccel + Proadload with the additional criteria that Pbrake = 0 whenever the calculation results in a positive value. [EPA-HQ-OAR-2010-0799-9487-A1, p.89]

In addition, the following clerical errors were discovered during our review of the NPRM: [EPA-HQ-OAR-2010-0799-9487-A1, p.89]

§600.116-12(c)(1)(i)(A): Road load equation has an extra “x” between 0.47704 and 4.448 [EPA-HQ-OAR-2010-0799-9487-A1, p.89]

§600.116-12(c)(3)(iii): “battery” is misspelled as “batter” [EPA-HQ-OAR-2010-0799-9487-A1, p.89]

§600.116-12(c)(4)(3)(iii): Definition of Erec under the Energy Recovered % equation references paragraph (c)(2)(iii), should reference paragraph (c)(3)(iii) instead [EPA-HQ-OAR-2010-0799-9487-A1, p.89]

§600.116-12(c)(4)(3)(iii): Conflicting nomenclature. Energy Recovered % equation uses Emax, which appears to be called Ebrake in the paragraph referenced by the Emax definition, §600.116-12(c)(2). [EPA-HQ-OAR-2010-0799-9487-A1, p.89]

Further, prior to the final rule, we plan to engage the agency technical experts to ensure that the test procedure specifications and regulatory language for determining the proportion of recovered braking energy is clear, accurate and consistent with previous hybrid procedural guidance (e.g., SAE J1711, Part 86, Part 600), where applicable. [EPA-HQ-OAR-2010-0799-9487-A1, pp.89-90]

Fuel Economy Calculations [EPA-HQ-OAR-2010-0799-9487-A1, p.91]

The Alliance suggests following corrections to the fuel economy calculations in § 600.113–12 (fuel economy, CO_2 emissions, and carbon-related exhaust emission calculations for FTP, HFET, US06, SC03 and cold temperature FTP tests): [EPA-HQ-OAR-2010-0799-9487-A1, p.91]

(l)(1) Ethanol FE equation: [EPA-HQ-OAR-2010-0799-9487-A1, p.91]
mpg = (CWF × SG × 3781.8)/((CWFexHC × HC) + (0.429 × CO) + (0.273 × CO_2) + (0.375 × CH3OH) + (0.400 × HCHO) + (0.521 × C2H5OH) + (0.545 × C2H4O)) [EPA-HQ-OAR-2010-0799-9487-A1, p.91]

Comment: This entire section needs review of equations, but specifically the ethanol equation and its importance to E15/E10 testing. The referenced FE equation is incorrect. The equation does not utilize net heating value (NHV) as an adjustment for different ethanol blends, so it is unclear how this equation accounts for different ethanol blends or equivalence back to the conventional gasoline FE equation. This equation will produce lower FE due to the fact that ethanol blended fuels have less energy content (NHV) per gallon than conventional gasoline. [EPA-HQ-OAR-2010-0799-9487-A1, p.91]

The Alliance requests a test procedure adjustment (TPA) that references the carbon weight fraction (CWF), net heating value, and specific gravity of the 1975 E0 reference fuel that was used to establish the initial CAFE baseline. A TPA (including coverage of the density and R-Factor) is necessary to maintain consistency with the 1975 test procedures. [EPA-HQ-OAR-2010-0799-9487-A1, p.91]

86.1866-12(b)(2)(ii) [EPA-HQ-OAR-2010-0799-9487-A1, p.92]

The reference to the annual refrigerant leakage rate in the definition section should be titled “LeakScore” instead of “Leakage” to align with the terminology in the Leakage Credit equation. [EPA-HQ-OAR-2010-0799-9487-A1, p.92]

Organization: American Honda Motor Co., Inc.

- U.S. “Production” vs. “Sales”: §86.1866-12(d)(1) shows a table that identifies certain off-cycle technologies, their credits for passenger cars and light trucks, and the “minimum percent of U.S. production” that must have a feature applied before receiving the off-cycle credit. We believe the intent of this section is better understood to be “minimum percent of U.S. Sales,” since many U.S. – produced vehicles are intended for export and are not relevant. Similarly, it is unclear how imported vehicles would be treated. [EPA-HQ-OAR-2010-0799-9489-A1, p. 6]

Organization: Toyota Motor North America

U.S. Production Criteria

There are provisions in the proposed regulations that reference U.S. production as a component of applicability or eligibility for those provisions. For example, in describing the minimum sales volume threshold for the list of pre-determined off-cycle technologies, §86.1866-12 (d)(l)(i) states 'The manufacturer may generate a CO_2 gram/mile credit ... provided that each technology is applied to the minimum percentage of the manufacturer's U.S. production of passenger automobiles ... for which credit is claimed'. Similarly, the provisions for advanced technology vehicles in §86.1866-12 (a)(l) state 'Electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles...that are certified, produced, and delivered for sale in the United States ... may use a value of zero (0) grams/mile ofCO_2''. [EPA-HQ-OAR-2010-0799-9586-A1, p.23]

A reasonable interpretation of the provisions above could imply they are applicable only to vehicles produced in the U.S. Toyota understands the agencies do not intend for the applicability or eligibility of the proposed regulations to depend on a vehicle's origin. [EPA-HQ-OAR-2010-0799-9586-A1, p.24]

Toyota requests that the agencies clarify that the eligibility and applicability of the provisions being proposed are not contingent on a manufacturer producing vehicles in the United States. We suggest that where the agencies currently reference 'U.S. production' in a provision, that language be revised to instead use the term "production for U.S. sale' which is consistent with the intent of the provisions in both the CAA and EISA/EPCA. [EPA-HQ-OAR-2010-0799-9586-A1, p.24]

Organization: Association of Global Automakers, Inc. (Global Automakers)

Global Automakers is concerned that the proposed regulatory language is not sufficient to truly make the MY 2022-2025 standards “conditional;” rather, they have all of the hallmarks of final standards that are simply subject to possible revision at a later time. As such, we believe that the proposed regulatory language violates the prohibition against adopting standards for more than five model years found in 49 U.S.C. § 32902(b)(3)(b). Global Automakers suggests that a better—and more legally defensible—approach would be to draft 49 C.F.R. § 531.5(c) to cover only vehicles through MY 2021, and to have MY 2022 through 2025 covered in a separate subsection that explicitly states that the standards for those model years are not final, but rather have been conditionally set at these levels subject to future de novo final rulemaking. [EPA-HQ-OAR-2010-0799-9466-A1, p. 10]

Organization: Borg Warner, Inc.

Additionally, for the “Engine Heat Recovery” off-cycle credit, although a clear definition is not provided in the Technical Support Document, it uses a term “thermoelectric device”. This term is normally applied to devices using the Peltier–Seebeck effect. We request that the EPA and NHTSA clarify the definition of “Engine Heat Recovery” to be technology neutral and include any device that captures waste heat energy and converts it into electricity for use on the vehicle. [EPA-HQ-OAR-2010-0799-9320-A1, p. 2]

Organization: Ferrari

40 CFR § 86.1838-01(b) is amended by adding a new subparagraph (4) as follows: [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(4)(a) Notwithstanding the provisions of subparagraph (b)(3), upon application to the Administrator, a manufacturer may be classified as a small volume manufacturer for purposes of this section, if the Administrator determines that it is operationally independent of the manufacturer that owns 10 percent or more of the applicant and, for the three years preceding the year in which the initial application is submitted, the average United States sales for the applicant does not exceed 5,000 vehicles per year. The Administrator may make a determination of operational independence if the criteria in (i)-(vii) are met for the at least 24 months preceding the application. [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(i) No financial or other support of economic value is provided by related manufacturers for purposes of design, parts procurement, R&D and production facilities and operation, and any other transactions between related manufacturers are conducted under normal commercial arrangements like those conducted with other parties, at competitive pricing rates to the manufacturer; [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(ii) related manufacturers maintain separate and independent research and development, testing, and production facilities; [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(iii) the applicant does not use any vehicle powertrains or platforms developed or produced by related manufacturers; [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(iv) patents are not held jointly with related manufacturers; [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(v) related manufacturers maintain separate business administration, legal, purchasing, sales, and marketing departments, as well as autonomous decision making on commercial matters; [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(vi) the overlap of the Board of Directors between related manufacturers is limited to 25% with no sharing of top operational management, including president, chief executive officer, chief financial officer, and chief operating officer, and provided that no individual overlapping director or combination of overlapping directors exercises exclusive management control over either or both companies; and [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(vii) parts or components supply between related companies must be established through open market process, and to the extent that the manufacturer sells parts/components to non-related manufacturers, it does so through the open market a competitive pricing. [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(b)(i) The Administrator shall require the applicant to submit information to update any of these factors as material changes to any factor occur. If there are no material changes to any of the factors, the applicant shall certify to the Administrator on an annual basis. With respect to any such changes, the Administrator may consider extraordinary conditions (e.g., changes to economic conditions, unanticipated market changes, etc.) and may continue to find the applicant to be operationally independent. [EPA-HQ-OAR-2010-0799-9535-A2, p.7]

(c) If a manufacturer loses its eligibility as an operationally independent small volume manufacturer at any time, the manufacturer must begin compliance with the primary greenhouse gas emissions program in the third model year after the manufacturer loses its eligibility. [EPA-HQ-OAR-2010-0799-9535-A2, p.8]

(d) If a manufacturer loses its eligibility as an operationally independent small volume manufacturer at any point in time, the manufacturer must meet the criteria in (a)(i)-(vii) for three consecutive years before applying to the Administrator to be again considered operationally independent. [EPA-HQ-OAR-2010-0799-9535-A2, p.8]

(e) The manufacturer applying for operational independence shall engage an independent certified public accountant, or firm of such accountants (hereinafter referred to as “CPA”), to perform an agreed-upon procedures attestation engagement of the underlying documentation that forms the basis of the application as required in (a)(i)-(vii). [EPA-HQ-OAR-2010-0799-9535-A2, p.8]

(i) The CPA shall perform the attestation engagements in accordance with the Statements on Standards for Attestation Engagements. [EPA-HQ-OAR-2010-0799-9535-A2, p.8]

(ii) The CPA may complete the requirements of this paragraph with the assistance of internal auditors who are employees or agents of the application, so long as such assistance is in accordance with the Statements on Standards for Attestation Engagements. [EPA-HQ-OAR-2010-0799-9535-A2, p.8]

(iii) Notwithstanding the requirements of subparagraph (ii) of this section, an applicant may satisfy the requirements of this paragraph if the requirements of this paragraph are completed by an auditor who is an employee of the applicant, provided that such employee: a. Is an internal auditor certified by the Institute of Internal Auditors, Inc. (hereinafter referred to as “CIA”); and b. Completes the internal audits in accordance with the Codification of Standards for the Professional Practice of Internal Auditing. [EPA-HQ-OAR-2010-0799-9535-A2, p.8]

(iv) Use of a CPA or CIA who is debarred, suspended, or proposed for debarment pursuant to the Government wide Debarment and Suspension Regulations, 2 CFR part 1532, or the Debarment, Suspension, and Ineligibility Provisions of the Federal Acquisition Regulations, 48 CFR part 9, subpart 9.4, shall be deemed in noncompliance with the requirements of this section. [EPA-HQ-OAR-2010-0799-9535-A2, p.8]

(v) The following documents are incorporated by reference: the Statements on Standards for Attestation Engagements, Codification of Statements on Auditing Standards, written by the American Institute of Certified Public Accountants, Inc., 1991, and published by the Commerce Clearing House, Inc., Identification Number 059021, and the Codification of Standards for the Professional Practice of Internal Auditing, written and published by the Institute of Internal Auditors, Inc., 1989, Identification Number ISBN 0- 89413-207-5. These incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the Statements on Standards for Attestation Engagements may be obtained from the American Institute of Certified Public Accountants, Inc., 1211 Avenue of the Americas, New York, New York 10036, and copies of the Codification of Standards for the Professional Practice of Internal Auditing may be obtained from the Institute of Internal Auditors, Inc., 249 Maitland Avenue, Altamonte Springs, Florida 32701- 4201. Copies may be inspected at the U.S. Environmental Protection Agency, Office of the Air Docket, 401 M St., SW., Washington, DC., or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_lo cations.html. [EPA-HQ-OAR-2010-0799-9535-A2, pp.8-9]

Organization: Fisker Automotive, Inc.

Given the feasibility of optionally complying to the greenhouse gas standards beginning with the 2012 model year, Fisker Automotive respectfully proposes the following modifications to the regulatory language: [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

§ 86.1801–12 Applicability.

(j) Exemption from greenhouse gas emission standards for small businesses.

(2) ~~Effective for the 2014 and later model years, a~~ A manufacturer that would otherwise be exempt under the provisions of paragraph (j)(1) of this section may optionally comply with the greenhouse gas emission standards specified in § 86.1818. A manufacturer making this choice is required to comply with all the applicable standards and provisions in § 86.1818 and in associated provisions in this part and in part 600 of this chapter. <u>A manufacturer may optionally comply with the greenhouse gas emission standards as soon as the rule goes into effect, beginning with the 2012 model year.</u> ~~Manufacturers may optionally earn early credits in the 2012 and/or 2013 model years by demonstrating CO_2 emission levels below the fleet average CO_2 standard that would have been applicable in those model years if the manufacturer had not been exempt. Manufacturers electing to earn these early credits must comply with the model year reporting requirements in § 600.512–12 for each model year.~~ [EPA-HQ-OAR-2010-0799-9266-A1, p. 3]

Organization: Ford Motor Company

Also related to the 5-cycle demonstration methodology, we believe there is a typographical error in the calculation described in 40 CFR § 86.1866-12(d)(2)(iii). The text indicates that the 5-cycle weighted city/highway value from paragraph (d)(2)(i) [without the off-cycle technology operating] should be subtracted from the value from paragraph (d)(2)(ii) [with the off-cycle technology operating] to determine the off-cycle benefit. Presumably, the carbon-related exhaust emissions from (d)(2)(ii) will be lower than those from (d)(2)(i), resulting in a negative value for the credit calculation. To remedy this, Ford believes the text of 40 CFR § 86.1866-12(d)(2)(iii) should be revised to state the following: [EPA-HQ-OAR-2010-0799-9463-A1, p. 17]

“Subtract the combined city/highway value determined in paragraph (d)(2)(ii) of this section from the value determined in paragraph (d)(2)(i) of this section”….. [EPA-HQ-OAR-2010-0799-9463-A1, p. 18]

Regulatory text clarification: With regard to the production volume multiplier and the 0 gram per mile emissions value, the proposed regulatory text reads as follows:

86.1866-12(a)(1) and (2) Electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles, as those terms are defined in S.86.1803-01, that are certified and produced and delivered for sale in the United States… [EPA-HQ-OAR-2010-0799-9463-A1, p. 20]

We request clarification that the intent is that the provisions apply to those vehicles “delivered for sale” in the United States, and that production in the United States is not a new conditional provision, per the following recommended revision:

86.1866-12(a)(1) and (2) Electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles, as those terms are defined in S.86.1803-01, that are certified and ~~produced and~~ delivered for sale in the United States… [EPA-HQ-OAR-2010-0799-9463-A1, p. 20]

Organization: Motor & Equipment Manufacturers Association (MEMA)

The definition in the proposed regulatory text at § 86.1866–12 (d)(1)(i) for active seat ventilation is "a device which draws air from the seating surface … and exhausts it … away from the seat." MEMA believes this definition is narrow in scope because there are other mechanisms for active seat ventilation available. For example, systems that push the air (versus drawing the air) to the seating surface and remove the heated, humid air between the seat surface and the passenger contact points just like the drawing type of active seat ventilation. Therefore, MEMA requests the agencies modify the definition to also include a push type system. [EPA-HQ-OAR-2010-0799-9478-A1, p.8]

In the NPRM's regulatory text for this section, § 86.1866–12 "CO_2 fleet average credit and incentive programs" Subpart (e) "Credits for certain full-size pickup trucks"9 there are several places where the mild and strong hybrid propulsions are referenced as "gasoline-electric." There are several other technical possibilities for full-size pick-up truck hybrids – such as, diesel-electric, gasoline-hydraulic, diesel-hydraulic. Therefore, MEMA strongly recommends that the agencies change the regulatory text to simply the term "hybrid" and to remove specific descriptive terms "gasoline-electric." Otherwise, the credits in this area would only be narrowly restricted to "gasoline-electric" hybrids, which MEMA believes is counter to the intent of the standards. [EPA-HQ-OAR-2010-0799-9478-A1, p.11]

---

11 - In the NPRM, it is proposed to issue a credit of 10g/mile (MY2017-2021) for mild hybrid full size pickup trucks, on the condition that the vehicle manufacturer produces a minimum of 30 percent of total full-size pickups as mild hybrids in 2017 subsequently increasing them to 80 percent of total full size pickups by 2021. A credit of 20g/mile will be issued if the manufacturer produces 10 percent of total full size pickups as strong hybrids.

Organization: Roush Industries, Inc.

Upon review of the subject document the absence of regulations to calculate constituent fuel economy, CREE and CAFÉ for the LPG alternate fuel was noted. [EPA-HQ-OAR-2010-0799-7823-A2, p. 1]

The LPG regulation proposal is recommended for inclusion in CFR 40 commencing Part 600.113-12 amongst the regulatory description for the other fuels. Also reference of LPG in Part 600.510-12 (Calculation of average fuel economy and average carbon-related exhaust emissions) is desirable. [EPA-HQ-OAR-2010-0799-7823-A2, p. 1]

Response:

Proportion of Recovered Braking Energy

The comments from the Alliance pointed out confusion over the appropriate sign for the terms in the equation used in this calculation. The regulations have been amended to clarify the appropriate sign for each term that will result in the equation being correct.

EPA appreciates the comments pointing out various clerical errors and conflicting nomenclature, and appropriate corrections have been made.

Fuel Economy Calculations

The ethanol equation was finalized in the MY 2012-2016 program, and EPA believes it to be correct. However, the regulations always permit manufacturers to approach EPA with alternative calculations that yield similar or improved results.

Production vs. Sales and U.S. Production Criteria

EPA agrees with the comment that suggests clarification. Certainly EPA does not intend any provision to be limited to vehicles produced in the U.S.

MY 2022-2025 Standards

The comments from the Association of Global Automakers are principally directed at NHTSA and that agency's statutory limitation regarding the establishing of CAFE standards. EPA does not face such a restriction, and EPA regulations are drafted accordingly.

Engine Heat Recovery

EPA has modified the definition in the final rule to read as follows. We believe this is consistent with the comments from Borg Warner.

(viii) *Waste heat recovery* means a system that captures heat that would otherwise be lost through the engine, exhaust system, or the radiator or other sources and converting that heat to electrical energy that is used to meet the electrical requirements of the vehicle or used to augment the warming of other load reduction technologies (e.g., cabin warming, active engine or transmission warm-up technologies).

Operational Independence Regulatory Provisions

The provisions regarding small volume manufacturers and operational independence provisions are discussed in detail in section III.B.5 of the preamble to the final rule. Ferrari was the strongest advocate of the operational independence provisions, and, as shown above, they proposed specific regulatory language. EPA agrees with the substance of the operational independence provisions as outlined in Ferrari's comments, and we note that their proposed regulatory language is essentially identical to the language in the preamble to the proposed rule. As described in the preamble to the final rule, EPA is finalizing the operational independence criteria that were described in the request for comments in the proposal (see 76 FR 74922).

Although our final regulations regarding operational independence criteria are consistent with our proposal and with Ferrari's proposed regulations, there is one key difference between our final rule and Ferrari's proposal. Ferrari proposed a regulatory structure that would broadly amend the existing definition of small volume manufacturer and would appear to expand the use of the operational independence provisions to a broad set of EPA emission control programs. EPA did not propose such a broad use of the operational independence criteria, and although the elements of the criteria are virtually the same as those proposed by Ferrari, we are finalizing the provisions such that their applicability is limited to determining eligibility for the specific GHG programs contemplated in the proposal (i.e., the remaining years of the conditional exemption for small manufacturers available through the 2016 model year, and the alternative standards for small manufacturers in the 2017 and later model years). The final operational independence regulations are structured such that other EPA programs could incorporate them, but doing so would require an evaluation of the impact and appropriateness of doing so and would have to be conducted via a separate notice and comment process.

Optional Small Business Compliance

At least one small business manufacturer, Fisker Automotive, in discussions with EPA prior to proposal, suggested that small businesses should have the option of voluntarily opting-in to the GHG standards. This manufacturer sells electric vehicles, and sees a potential market for selling credits to other manufacturers. As discussed in the proposal, EPA believes that there could be several benefits to this approach, as it would allow small businesses an opportunity to generate revenue to offset their technology investments and to encourage commercialization of the innovative technology. There would likewise be a benefit to any manufacturer seeking those credits to meet their compliance obligations. EPA proposed and is finalizing allowing small businesses to waive their small entity exemption and opt-in to the primary GHG standards based on this same rationale. This will allow small business manufacturers to earn CO_2 credits under the program, which may be an especially attractive option for the new electric vehicle manufacturers entering the market. The small business would have to meet the primary standard for its fleet (that is, the small business would be allowed to opt-in to the primary program standard, but not the small volume manufacturer standards, since SVMs are not eligible to generate credits for trading as explained above). As proposed, manufacturers waiving their small entity exemption must meet all aspects of the GHG standards and program requirements across their entire product line.

EPA proposed to make the opt-in available starting in MY 2014, as the MY 2012, and potentially the MY 2013, certification process will have already occurred by the time this rulemaking is finalized. See 76 FR at 74994. EPA proposed this timing to avoid retroactively certifying vehicles that have already been produced. EPA proposed, however, that manufacturers certifying to the GHG standards for MY 2014 would be eligible to generate credits for vehicles sold in MY 2012 and MY 2013 based on the number of vehicles sold and the manufacturer's footprint-based standard under the primary program that would have otherwise applied to the manufacturer if it were a large manufacturer. This approach would be similar to that used by EPA for early credits generated in MYs 2009-2011, where manufacturers did not certify vehicles to CO_2 standards in those years but were able to generate credits. See 75 FR at 25441.

EPA received comments from Fisker requesting that EPA reconsider the timing of the opt-in provisions. Fisker commented that under EPA's proposal, manufacturers would not be able to generate credits until the end of MY 2014, even for vehicles that are produced in MYs 2012-2013. Fisker commented that this would significantly diminish the revenue generating benefit of these credits, particularly during the critical early years of their company when potential credit revenues would be of most benefit to the company. EPA is persuaded by this reasoning, and the final rule therefore provides that believes that the opt-in provisions begin with MY 2013. See §86.1801-12(j)(2)(i). The timing of the final rule will allow the GHG requirements to be integrated into the MY 2013 certification process for these small businesses. Once the small business manufacturer opting into the GHG program completes certification for MY 2013, the company will be eligible to generate GHG credits for their MY 2012 production. Manufacturers will not have to wait until the end of MY 2013 to generate MY 2012 credits. EPA believes this provision is responsive to the concerns of the commenter while still ensuring that the manufacturer is certified under the GHG program prior to generating credits.

Regulatory Text Clarifications from Ford

EPA appreciates the detailed look that Ford and some other manufacturers took at the regulations, and informing us of errors and useful clarifications. These have been incorporated to the extent that is appropriate.

Active Seat Ventilation Definition

EPA agrees with the commenter and has modified the definition to read as follows:

(ix) *Active seat ventilation* means a device which draws air, pushes or forces air, or otherwise transfers heat from the seating surface which is in contact with the seat occupant and exhausts it to a location away from the seat. At a minimum, the driver and front passenger seat must utilize this technology for a vehicle to be eligible for credit.

Definition of Mild and Strong Hybrid Electric Vehicles

EPA agrees with the commenter and the regulations have been amended to no longer use the phrase "gasoline-electric." The final regulations should be neutral regarding the fuel that is paired with a hybrid battery system.

Calculation of Values for LPG

In response to the comments, EPA has added equations for calculating the MPG for LPG vehicles.

22. Comments Regarding EPA Tier 3 Rulemaking

Organizations Included in this Section

American Lung Association of the Mid-Atlantic
Environmental Defense Fund (EDF)
Union of Concerned Scientists (UCS)

Organization: American Lung Association of the Mid-Atlantic

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, pp. 83-84.]

Therefore, just last week the American Lung Association nationally in concert with six other leading public health and medical organizations wrote to EPA Administrator Lisa Jackson to request that she should move forward with Tier 3 vehicle emission and fuel standards, and that she finalize those standards as soon as possible.

According to the National Association of Clean Air Agencies, by 2030 such standards will reduce overall mobile source emission of NO_x by 29 percent, CO by 38 percent and VOCs by 26 percent.

Organization: Environmental Defense Fund (EDF)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 175.]

We respectfully urge EPA to build from the foundation forged by California's leadership and immediately propose Tier 3 emissions and gasoline fuel standards for passenger vehicles and to finalize these protections by the summer of 2012. Such rigorous programs would have immediate and far-reaching health and environmental benefits.

Organization: Union of Concerned Scientists (UCS)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 140-141.]

In addition, we urge the EPA to move forward expeditiously with the next round of criteria pollutant standards -- the Tier 3 emissions and gasoline standards for passenger vehicles -- and to finalize these protections by the summer of 2012. A rigorous Tier 3 program would have immediate and far-reaching health and environmental benefits: Reducing harmful airborne contaminants, ensuring longer and healthier lives, and helping states and communities across our country to restore healthy air. These vital health protections will be achieved at an extremely modest cost. Timely finalization of Tier 3 standards would allow manufacturers to efficiently align technology upgrades with the proposed 2017 through 2025 fuel efficiency and greenhouse gas emissions standards.

Response:

These comments deal with a different rulemaking matter and so are outside the scope of this rulemaking.

22.1. Tier 3 Standards

Organizations Included in this Section

American Lung Association
California Air Resources Board (CARB)
Environmental Defense Fund (EDF)
Mercedes-Benz USA, LLC
Renewable Fuels Association (RFA)
South Coast AQMD

Organization: American Lung Association

Also, promulgation of a Tier 3 vehicle and fuels standard would complement the proposed rule while reducing overall mobile source emissions of nitrogen oxides by 29 percent, carbon monoxide by 38 percent and volatile organic compounds by 26 percent by 2030. [EPA-HQ-OAR-2010-0799-9902-A2, p. 2]

Organization: California Air Resources Board (CARB)

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, p. 14.]

We know that EPA is nearing completion of its Tier 3 proposal to address these same pollutants from passenger vehicles. We know this because we shared with you our assessment of the feasible standards and the implementation schedule, and we've worked together to reach a common understanding of the many testing and compliance details.

We urge you to propose and finalize this Tier 3 regulation as soon as possible. It will benefit the vehicle manufacturers in that they'll be able to build one car that meets California and EPA standards. And it will benefit California and our partner states by assuring that federally certified new cars that subsequently operate in our states will be as clean as those sold here and purchased by our citizens.

Organization: Environmental Defense Fund (EDF)

II. EDF URGES EPA TO FINALIZE TIER 3 STANDARDS IN 2012

We strongly urge EPA to immediately propose Tier 3 emissions and gasoline standards for passenger vehicles and to finalize these protections by the summer of 2012. A rigorous Tier 3 program would have immediate and far-reaching health and environmental benefits: reducing a cascade of harmful airborne contaminants, ensuring longer and healthier lives, and helping states and communities across our country restore healthy air. [EPA-HQ-OAR-2010-0799-9519-A1, p. 3]

In a May 2010 Rose Garden ceremony, President Obama announced his intention to finalize a Tier 3 program by 2012 that would reduce sulfur levels in gasoline and introduce cleaner cars and light trucks on the same schedule as his already-finalized greenhouse gas program. Proposing this program now will help ensure that the President's commitment is kept. And timely finalization of Tier 3 standards would allow manufacturers to efficiently align technology upgrades with the proposed fuel efficiency and greenhouse gas emissions standards. [EPA-HQ-OAR-2010-0799-9519-A1, pp. 3-4]

Millions of Americans breathe cleaner, healthier air as a result of the U.S. Environmental Protection Agency's leadership in carrying out our nation's clean air laws. But serious challenges remain. More than 1 in 3 Americans still live in areas where air pollutant levels exceed at least one of the health-based National Ambient Air Quality Standards. And passenger vehicles remain the second largest emitters of oxides of nitrogen and volatile organic compounds in the U.S. – the primary pollutants that form ozone. These vehicles also emit more than half of all carbon monoxide pollution and contribute significantly to lethal particulate matter emissions.15 [EPA-HQ-OAR-2010-0799-9519-A1, p. 3]

A protective Tier 3 program has the potential to cut gasoline vehicle emissions of nitrogen oxides by nearly sixty percent, carbon monoxide by about 38 percent, and volatile organic compounds by close to a third when these protections are carried out. The substantial emissions reductions from all vehicles will translate into more than 400 avoided premature deaths and 52,000 avoided lost workdays each year.16 [EPA-HQ-OAR-2010-0799-9519-A1, p. 4]

Reducing sulfur in gasoline will also result in an immediate reduction in emissions from the existing fleet – on the order of approximately 260,000 tons of nitrogen oxides in 2017 when the program begins – equivalent to taking 33 million cars off our nation's roads. And the additional cost to consumers of the cleaner gasoline would be less than a penny a gallon.17 [EPA-HQ-OAR-2010-0799-9519-A1, p. 4]

A timely federal Tier 3 program is also imperative for states to meet the health-based National Ambient Air Quality Standards, including the ozone standard adopted in 2008, which assumed final Tier 3 emissions and gasoline standards in its baseline. Emissions reductions not achieved through a rigorous Tier 3 program would have to come from controls on local sources, which could be far less significant in magnitude and less cost-effective. [EPA-HQ-OAR-2010-0799-9519-A1, p. 4]

Organization: Mercedes-Benz USA, LLC

DAG supports the agencies' efforts to implement the Tier III and LEV III programs and will continue to work towards a nationwide requirement for ultra low sulfur gasoline to maximize the potential for direct injection gasoline engines. [EPA-HQ-OAR-2010-0799-9483-A1, p. 2]

Organization: Renewable Fuels Association (RFA)

EPA/NHTSA must ensure the final standards are harmonized with the upcoming "Tier 3" vehicle and fuel standards. [EPA-HQ-OAR-2010-0799-9490-A1, p.2]

IN ADDITION TO MAKING CERTAIN THE PROPOSED CAFE/GHG STANDARDS ARE COMPLEMENTARY TO THE REQUIREMENTS OF RFS2, EPA MUST ALSO ENSURE THE FINAL STANDARDS ARE HARMONIZED WITH THE UPCOMING "TIER 3" VEHICLE AND FUEL STANDARDS. [EPA-HQ-OAR-2010-0799-9490-A1, p.6]

In the current CAFE/GHG proposal, EPA states that it will propose Tier 3 vehicle and fuel standards "in the near future." The Tier 3 rulemaking, which EPA acknowledges will generally apply to the "same set of new vehicles…as would the proposed light-duty GHG emissions standards," is expected to set new limits for tailpipe and evaporative emissions from light-duty vehicles, including volatile organic compounds, nitrogen oxides, particulate matter, and air toxics. EPA acknowledges the need for close coordination of the Tier 3 rules with the CAFE/GHG standards, such that automakers and fuel providers can most effectively plan for the future regulatory landscape. [EPA-HQ-OAR-2010-0799-9490-A1, p.7]

Vehicle engines, the fuels that power them, and emissions control systems must be considered as equally important components of integrated systems. Thus, EPA/NHTSA should take a systems approach to the coordination of pending and existing regulations that affect both future fuel composition and future vehicle and engine technology. It is absolutely critical that EPA/NHTSA ensure the requirements of one rule don't impede the regulated community's ability to comply with the requirements of separate, but related, rules. [EPA-HQ-OAR-2010-0799-9490-A1, p.7]

Organization: South Coast AQMD

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 70-71.]

While the focus of the proposed rule is on greenhouse gas emissions, we urge U.S. EPA to move forward with proposals to set criteria pollutant tailpipe emissions standards as soon as possible.

Response:

These comments all deal with issues outside the scope of this rulemaking.

22.2. Changes to Fuel Specifications

Organizations Included in this Section

Alliance of Automobile Manufacturers
American Petroleum Institute (API)
Growth Energy
Volvo Car Corporation (VCC)

Organization: Alliance of Automobile Manufacturers

Fuel quality improvement can help further the program goals. As EPA has requested, the Alliance plans to make its substantive comments about market fuel quality specifications within the context of the pending EPA "Tier 3" proposed rule (and perhaps independently as well, separate from the Tier 3 rulemaking) and will not elaborate on them here. We want to note, however, that fuel quality can have a significant impact on fuel efficiency and GHG emission reductions. [EPA-HQ-OAR-2010-0799-9487-A1, pp.5-6]

In the meantime, it is expected that market fuel sulfur content and possibly other fuel properties will be addressed as part of the pending EPA "Tier 3" rulemaking. As noted above, market fuel developments need to be part of the planned Mid Term Evaluation incorporated in this rule. [EPA-HQ-OAR-2010-0799-9487-A1, p.85]

As EPA has requested, the Alliance plans to make its substantive comments about market fuel quality specifications within the context of the pending EPA "Tier 3" proposed rule (and perhaps independently as well, separate from the Tier 3 rulemaking) and will not elaborate on them here. [EPA-HQ-OAR-2010-0799-9487-A1, p.85]

Alliance members want to underscore for the rulemaking record and any future regulatory review that in reserving substantive comments on fuel quality to the pending Tier 3 rulemaking as requested, we recognize that considerable benefits could inure to fuel efficiency and economy, and GHG emission reductions (and thus to the relevant statutory authority for this rulemaking), from fuel quality changes addressed elsewhere. We are relying on the agency that consideration of such benefits and reliance on such authority will not be foreclosed by reserving our fuel quality comments for the Tier 3 rulemaking or other rulemaking initiatives. [EPA-HQ-OAR-2010-0799-9487-A1, p.85]

Organization: American Petroleum Institute (API)

EPA's Plans for Further Standards for Light-Duty Vehicle Criteria Pollutants and Gasoline Fuel Quality

EPA references plans to propose a "Tier 3" program of emissions and fuel quality standards intended to further reduce non-GHG pollutants (including volatile organic compounds, nitrogen oxides, particulate matter, and air toxics) from new light-duty vehicles. API and its members firmly support the principle that no Tier 3 regulation of fuel quality should be proposed without first providing a thorough science-based justification that demonstrates the health benefits along with a rigorous economic and supply impact analysis that assesses fundamental cost and energy security consequences related to the viability of a domestic refining industry. As noted above, vehicle technologies that might require fuel changes are not likely to be employed for meeting the CAFE standards proposed for MY 2017 – 2025 light-duty vehicles. [EPA-HQ-OAR-2010-0799-9469-A1, p. 8]

Until EPA releases data and analysis on the benefits of the Tier 3 standards under consideration, a comprehensive fuel/vehicle system-focused assessment cannot be conducted or evaluated by stakeholders and/or the public. In this regard, EPA should complete an Anti-Backsliding study of the RFS program and make it available for public scrutiny and comment prior to proposing any rule to change fuel quality. Congress mandated the study, which is now more than two years overdue. In addition, EPA has indicated to industry that it has been performing emissions measurements on in-use vehicles operated on gasoline fuels containing significantly lower levels of sulfur. These data and EPA's associated analyses also need to be made publicly available prior to the issuance of a proposed rule. Absent these actions and a demonstration that fuel changes will achieve cost effective emissions reductions that would improve air quality or have other health benefits, EPA should not propose a Tier 3 Rule. By moving forward with a Tier 3 proposal, EPA is making conclusions based on an incompletely vetted set of data and analysis and is allowing scant time for scrutiny from interested stakeholders. [EPA-HQ-OAR-2010-0799-9469-A1, p. 9]

• Tier 3 fuel requirements are unnecessary and unjustified - The EPA should not link a Tier 3 program of non-GHG emissions and fuel quality standards for new light-duty vehicles to the referenced proposed rulemaking. The EPA has not yet completed long overdue studies mandated by Congress, nor has it conducted and released a thorough science-based justification that demonstrates the need for Tier 3. Finally, the Agency has yet to provide stakeholders with adequate opportunity to evaluate and submit input on all of the data and analysis that it has collected and performed to support such an initiative. [EPA-HQ-OAR-2010-0799-9469-A2, p. 2]

Organization: Growth Energy

II. Potential Fuel Parameter Changes

A. Background

In the Joint NPRM EPA did not evaluate potential fuel quality changes in the GHG proposal. The proposed rule contains the following discussion with respect to the Tier 3 standards and possible fuel changes: In the May 21, 2010 Presidential Memorandum, in addition to addressing GHGs and fuel economy, the President also requested that EPA examine its broader motor vehicle air pollution control program. The President requested that ''[t]he Administrator of the EPA review for adequacy the current nongreenhouse gas emissions regulations for new motor vehicles, new motor vehicle engines, and motor vehicle fuels, including tailpipe emissions standards for nitrogen oxides and air toxics, and sulfur standards for gasoline. If the Administrator of the EPA finds that new emissions regulations are required, then I request that the Administrator of the EPA promulgate such regulations as part of a comprehensive approach toward regulating motor vehicles.'' [EPA-HQ-OAR-2010-0799-9505-A1, p. 31]

EPA is currently in the process of conducting an assessment of the potential need for additional controls on light-duty vehicle non-GHG emissions and gasoline fuel quality. EPA has been actively engaging in technical conversations with the automobile industry, the oil industry, nongovernmental organizations, the states, and other stakeholders on the potential need for new regulatory action, including the areas that are specifically mentioned in the Presidential

Memorandum. EPA will coordinate all future actions in this area with the State of California. [EPA-HQ-OAR-2010-0799-9505-A1, p. 32]

Based on this assessment, in the near future, EPA expects to propose a separate but related program that would, in general, affect the same set of new vehicles on the same timeline as would the proposed light-duty GHG emissions standards. It would be designed to address air quality problems with ozone and PM, which continue to be serious problems in many parts of the country, and light-duty vehicles continue to play a significant role. [EPA-HQ-OAR-2010-0799-9505-A1, p. 32]

EPA expects that this related program, called ''Tier 3'' vehicle and fuel standards, would among other things propose tailpipe and evaporative standards to reduce non-GHG pollutants from light-duty vehicles, including volatile organic compounds, nitrogen oxides, particulate matter, and air toxics. EPA's intent, based on extensive interaction to date with the automobile manufacturers and other stakeholders, is to propose a Tier 3 program that would allow manufacturers to proceed with coordinated future product development plans with a full understanding of the major regulatory requirements they will be facing over the long term. This coordinated regulatory approach would allow manufacturers to design their future vehicles so that any technological challenges associated with meeting both the GHG and Tier 3 standards could be efficiently addressed. [EPA-HQ-OAR-2010-0799-9505-A1, p. 32]

It should be noted that under EPA's current regulations, GHG emissions and CAFE compliance testing for gasoline vehicles is conducted using a defined fuel that does not include any amount of ethanol. If the certification test fuel is changed to some ethanol-based fuel through a future rulemaking, EPA would be required under EPCA to address the need for a test procedure adjustment to preserve the level of stringency of the CAFE standards.26 EPA is committed to doing so in a timely manner to ensure that any change in certification fuel will not affect the stringency of future GHG emission standards. [EPA-HQ-OAR-2010-0799-9505-A1, p. 32]

The discussion indicates EPA will evaluate changes to certification fuel in Tier 3, and if there are changes made to this certification fuel, that EPA would be required under EPCA to preserve the stringency of the GHG standards. Thus, EPA acknowledges that certification fuel has an effect on GHG emissions, and therefore also acknowledges that vehicles and fuels operate as a system, not only for the criteria pollutants like PM and NO_x, but also GHGs. And yet, EPA did not evaluate changes in fuel for the GHG rule. Growth Energy believes that because vehicles and fuels are obviously inseparable when it comes to both criteria pollutants and GHG emissions, that the Agencies should have evaluated both changes to vehicles and fuels for the GHG rule. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 32-33]

EPA has not yet published its Tier 3 proposal, and it is possible that EPA will propose new certification fuel requirements that directly affects the ability of automakers to meet the GHG requirements. Therefore, new certification fuels should have been examined in the GHG requirements, and it is in this context that Growth Energy proposes a new certification and in-use fuel for 2017 and later cars and light duty trucks. We believe that EPA and the Agencies should examine this proposed certification and in-use fuel as an alternative in developing the final GHG/CAFÉ rules for 2017-2025 vehicles. [EPA-HQ-OAR-2010-0799-9505-A1, p. 33]

Growth Energy's proposal for 2017 certification fuel is shown in Table 3. This certification fuel is essentially the same as the Alliance of Automobile Manufacturer's proposal to CARB, but with the addition of 20 volume percent more ethanol, so that octane is higher, the distillation parameters are changed, and other parameters are lower by dilution. [Table 3 can be found on p. 33 of Docket number EPA-HQ-OAR-2010-0799-9505-A1] [EPA-HQ-OAR-2010-0799-9505-A1, p. 33]

Fuel marketers would be required to produce fuel that would be similar to this proposed fuel for 2017+ vehicles.27 In conventional areas of the U.S., it would meet EPA's sulfur, MSAT and RVP regulations, but still have 94 octane and 30% ethanol. In reformulated gasoline areas, it would meet the requirements of the RFG regulations, the low sulfur regulations, and the MSAT and RVP regulations, but otherwise have 94 octane and 30% ethanol. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 33-34]

Most of the U.S. already has E10, so both RFG and conventional fuel already contains E10 for the current fleet. Adding 20% more ethanol to these fuels would increase octane, reduce sulfur, reduce RVP, reduce total and multi-substituted aromatics, olefins, benzene, and change the T50 and T90 points. [EPA-HQ-OAR-2010-0799-9505-A1, p. 34]

Other concepts of this proposal are as follows:

- Automakers would certify 2017+ vehicles only on E30, they would not be required to certify on E10. The legacy fleet would continue to operate on E10
- Ramp-up of ethanol for E30 would build with the introduction of each successive model year of 2017+ vehicles. Ethanol would have to be used preferentially for E30, then for E10 in the legacy fleet.
- There may be a net positive impact on upstream GHG emissions from producing the base gasoline (normalized to gasoline volume); this would have to be evaluated [EPA-HQ-OAR-2010-0799-9505-A1, p. 34]

The primary advantages of implementing this type of fuel are:

- Low carbon intensity ethanol volumes ramp up slowly from calendar year 2017 as the new vehicles using this fuel are introduced into the fleet, and continue ramping up well beyond the 2020-2022 timeframe, providing ongoing upstream (i.e., lifecycle) GHG reductions well into the future (through 2040) beyond the RFS.
- Currently the cellulosic projections in the RFS are not being met in part because the United States ethanol market is saturated by E10. Creating an E30 certification fuel would send a fresh market signal to the cellulosic industry that market space is being created through this new fuel standard. To meet the 36 billion gallon biofuel projection by 2022, market access for advanced (50% lifecycle emissions reduction) and cellulosic ethanol (60% lifecycle emissions reduction) must be offered a path. This proposal would provide that opportunity as well as the other benefits a higher octane standard would offer.
- Automakers should be able to use the higher octane ethanol fuel to boost engine efficiency beyond the engine efficiency obtained from the current Agency proposal

(tailpipe GHG emissions would be the same as the Agency proposal), maintaining the same fuel economy and vehicle range

- Importantly, exhaust Particulate Matter (PM) emissions and carbon monoxide (CO) emissions from 2017-2025 model year vehicles would be much lower than the current proposal because of increased fuel oxygen content. [EPA-HQ-OAR-2010-0799-9505-A1, p. 34]

Other criteria pollutant emissions (exhaust and evaporative NMOG and NO_x) from onroad 2017+ motor vehicles should be the same with E30 as with current certification fuel, whether they are Tier 2 or Tier 3 vehicles, since the same tailpipe and evaporative standards must be met. Distribution of the E30 fuel should ultimately be no more difficult than E85 distribution, which has to take place anyway because of the RFS. The slow phase-in of E30 gives time for additional low carbon intensity (i.e., cellulose and other) ethanol supplies to develop. [EPA-HQ-OAR-2010-0799-9505-A1, p. 35]

It is also important to note that Tier 2 and Tier 3 vehicles will have to meet very low emission standards for evaporative NMOG, exhaust NMOG, CO, and NO_x, no matter what fuel they are certified on. So ultimately, there should be no difference in these emissions between an E10 fuel and an E30 fuel. A number of manufacturers offer FFVs that meet Tier 2 and emission standards on E85 and E0 now. Increasing ethanol from E10 to E30 reduces fuel volatility, so depending on a final volatility specification, meeting evaporative requirements could be somewhat less difficult with an E30 blend. Fuel system permeation also contributes to evaporative emissions. Permeation emissions have not been studied on E30 blends, but a Coordinating Research Council study on permeation from ethanol blends between E6 and E20 found that increasing ethanol content from E10 to E20 increased diurnal permeation emissions by about 16% on five vehicles, however, one FFV that was tested experienced lower permeation emissions on E20 than E10. This factor should also be considered in a revised cost-benefit analysis. [EPA-HQ-OAR-2010-0799-9505-A1, pp. 40-41]

---

26 EPCA requires that CAFE tests be determined from the EPA test procedures in place as of 1975, or procedures that give comparable results. 49 USC 32904(c).

27 Subject to approval/oversight by EPA and others, E30 could be marketed to FFVs prior to calendar year 2017. Current FFV customers probably often have E30 in their fuel tanks if they switch back-and-forth between E85 and E0.

Organization: Volvo Car Corporation (VCC)

Certification Gasoline and Harmonization

VCC supports a single certification fuel for EPA and CARB. It is expensive and inefficient to develop toward and store several different fuels to meet two nearly identical regulations. [EPA-HQ-OAR-2010-0799-9551-A2, p. 13]

When EPA/NHTSA/CARB require different fuels, it effectively doubles the amount of testing manufacturers are required to perform, while yielding limited, if any, additional environmental benefit. Even though it appears that 10% ethanol is likely to be the most common fuel on the U.S. market for the foreseeable future, EPA has, through the upcoming TIER3 regulation, indicated that it will require E15. [EPA-HQ-OAR-2010-0799-9551-A2, p. 13]

The consequence of this would be that CARB and EPA will have different certification gasoline requirements. To eliminate unnecessary duplicative testing, VCC has requested that CARB accept certification using the EPA proposed fuel from MY2017. VCC requests though that EPA/NHTSA/CARB reach a harmonized approach toward a national fuel for certification after reaching a common approach towards harmonized definition of CO_2 and fuel economy. [EPA-HQ-OAR-2010-0799-9551-A2, p. 14]

Response:

These comments regarding possible changes to fuel specifications under a future EPA Tier 3 rulemaking are outside the scope this GHG rulemaking.

23. Request for Extension of the Comment Period

Organizations Included in this Section

Association of Global Automakers, Inc. (Global Automakers)
National Automobile Dealers Association (NADA)
Volkswagen

Organization: Association of Global Automakers, Inc. (Global Automakers)

The Association of Global Automakers, Inc. hereby requests a 30-day extension from January 30, 2012 to March 1, 2012 to submit its comments on the Notice of Proposed Rulemaking (NPRM) for 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards [76 FR 74854, December 1, 2011]. [EPA-HQ-OAR-2010-0799-1307-A1, p.1]

The need for this extension is underscored by the following: [EPA-HQ-OAR-2010-0799-1307-A1, p.1]

1. The complexity, cost, and importance of this rulemaking warrant allowing all stakeholders sufficient time to review and understand the extensive Federal Register and supporting documents and to provide meaningful feedback to the agencies. Although the basic outline of the proposal was announced in advance through a supplemental notice of intent, the details of the proposal were not publicly available until the issuance of the proposal. These details are of critical importance to participants in the rulemaking in developing a full understanding of the potential impacts of this far-reaching rulemaking. [EPA-HQ-OAR-2010-0799-1307-A1, p.1]

2. The release of this rulemaking corresponds to the release of other complex and significant rulemaking documents by the California Air Resources Board (ARB), which are not limited to GHG standards but also include proposals for the next round of low emission vehicle criteria pollutant standards for 2015+ vehicles, zero emission vehicles, clean fuels outlets, and environmental performance labeling. [EPA-HQ-OAR-2010-0799-1307-A1, p.1]

3. The current end date of the comment period falls on the heels of the public hearings, which will require additional time and resource commitments: [EPA-HQ-OAR-2010-0799-1307-A1, p.1]

a. The public hearings for the EPA-NHTSA proposal are scheduled on January 17, 19, and 24, 2012. [EPA-HQ-OAR-2010-0799-1307-A1, p.1]

b. The ARB Board hearing on the aforementioned California regulations is scheduled for January 26-27, 2012. [EPA-HQ-OAR-2010-0799-1307-A1, p.1]

These overlapping and important rulemaking activities, in combination with the approaching holiday season, make a modest extension of the comment period even more compelling. All of our member companies and the auto industry generally are closed during the week between Christmas and New Years Day, making communications among the Association and our members extremely difficult. [EPA-HQ-OAR-2010-0799-1307-A1, pp.1-2]

Furthermore, as noted in the NPRM and the Notice of Public Hearings for the proposal [76 FR 76932, December 9, 2011], NHTSA and EPA are required to “keep the official record of each hearing open for 30 days to allow speakers to submit supplementary information” [76 FR 76933], as required by § 7607 (d)(5)(iv) of the Clean Air Act. Therefore, the public hearing record must remain open until February 23, 2012 or so. Thus, approving our request would have no material impact on the rulemaking schedule. [EPA-HQ-OAR-2010-0799-1307-A1, p.2]

Organization: National Automobile Dealers Association (NADA)

By this letter, NADA requests an extension of the January 30, 2012, comment period deadline for the above-referenced proposed rulemaking for an additional 30 days or until February 29, 2012. 76 Fed. Reg. 76932, et seq. (December 9, 2011). In support of this request, please recognize and consider the following: [EPA-HQ-OAR-2010-0799-1308-A1, p.1]

1. The joint proposal is 567 Federal Register pages long. It is accompanied by a 482 page Draft Joint Technical Support Document, an 833 page Preliminary Regulatory Impact Analysis, and a 482 page Draft Environmental Impact Statement. These three documents cite hundreds of other documents. In addition, the EPA docket currently contains 726 non-comment documents and the NHTSA docket currently contains 148 non-comment documents. Despite an intention to devote substantial resources to the task, NADA cannot complete a review of these documents by January 30, 2012. [EPA-HQ-OAR-2010-0799-1308-A1, p.1]

2. On December 9, 2011, NHTSA and EPA issued a notice with details regarding three public hearings on the proposal. 76 Fed. Reg. 76932-3 (December 9, 2011). NADA immediately arranged for three dealers to testify at these hearings, sending an e-mail to EPA with the specifics requested in the December 9 notice. Consequently, in addition to developing comments responding to the joint proposal, NADA will be working diligently to assist these dealers with the development of their testimony. Given the short time frame involved, this will be a daunting task. [EPA-HQ-OAR-2010-0799-1308-A1, p.2]

3. As recognized by EPA and NHTSA, the Clean Air Act requires that the records for the hearings discussed above be kept open for at least 30 days following each hearing. 42 USC §7607(d)(5). At the very least, this means that EPA must accept written submissions pertaining to the January 24, 2012, hearing until at least February 23, 2012. 42 USC §7607(d)(5). Consequently, extension of the comment period to February 29, 2012, will have no negative consequences for the regulatory development process. [EPA-HQ-OAR-2010-0799-1308-A1, p.2]

4. On December 7, 2011, the California Air Resources Board (CARB) announced a voluminous package of advanced Clean Car Rules. These rules in part relate to the NHTSA/EPA proposal and, if promulgated and granted a preemption waiver, will apply (at least in part) in as many as

15 states. Consequently, NADA's limited resources also are burdened with reviewing and responding to this CARB proposal, a hearing for which is scheduled for January 26-27, 2012. [EPA-HQ-OAR-2010-0799-1308-A1, p.2]

5. The NHTSA/EPA proposal seeks to establish CAFE and GHG mandates which, at the earliest, would begin to take effect in MY 2017. The proposal is not tied to a specific statutory deadline. Indeed, the 35 mpg standard recently promulgated for MY 2016 will kick in some four years earlier than Congress contemplated. 49 USC §32902(b)(2)(A). In any event, new CAFE standards must be issued at least 18 months prior to the model year in question. 49 USC §32902(a). In addition, new GHG standards may not issue sooner than the model year commencing 4 years after they are promulgated. 42 USC §7521(a)((3)(C). Thus, affording interested parties an additional 30 days to submit comments will neither conflict with a statutory deadline nor interfere with existing statutory mandates designed to provide vehicle manufacturers with adequate lead time. [EPA-HQ-OAR-2010-0799-1308-A1, p.2]

6. Of primary importance is the issue of fair and adequate due process. Persons potentially impacted by the December 1, 2011, proposal are entitled to a reasonable opportunity to provide comment and testimony to the record. In this regard, NADA appreciates the fact that NHTSA and EPA allowed interested parties the opportunity to provide input in response to several Notices of Intent leading up to the proposal. NADA also applauds the three hearing opportunities mentioned above. It is in light of these fair and adequate opportunities for public participation that NADA urges NHTSA and EPA to recognize that 60 days is an insufficient amount of time for interested parties to develop and submit written comments on what may well be the most voluminous, most far reaching, and most expensive regulatory proposal ever issued by the Federal government. [EPA-HQ-OAR-2010-0799-1308-A1, p.2]

7. For comparison purposes, NADA pulled from its stack of regulatory notices two recently issued items of interest to its members. The first, an EPA notice of some 89 pages involving proposed management standards for the underground storage tanks sometimes found at dealerships, allows for a 90 day comment period. 76 Fed. Reg. 71708, et seq. (November 18, 2011). The docket for this proposal currently contains a mere 211 documents. The second, a NHTSA notice involving Theft Protection and Rollaway Prevention is 17 pages long yet it also affords 90 days for public comment. 76 Fed. Reg. 77183, et seq. (December 12, 2011). The docket for that proposal currently contains roughly 2 documents. Note that NADA is in no way suggesting that these proposals are any less important than the joint CAFE/GHG proposal, only that they would appear to be no more (and arguably far less) complex and burdensome for interested parties to digest and respond to. [EPA-HQ-OAR-2010-0799-1308-A1, p.3]

For all of the above-listed reasons, NADA urges NHTSA and EPA to extend the comment period in this matter to February 29, 2012. [EPA-HQ-OAR-2010-0799-1308-A1, p.3]

In mid-December, NADA petitioned NHTSA and EPA for a 30 day extension of the 60 day comment period. A month later, a 14 calendar day extension was granted. Hearings on the proposal were held on January 17, January 19, and January 24, 2012, with NADA dealer-directors presenting testimony at each. The hearing records remain open for 30 days. [EPA-HQ-OAR-2010-0799-9575-A1, p. 2]

Organization: Volkswagen

With this letter Volkswagen Group of America (Volkswagen) requests a 30 day extension to the comment period for the Notice of Proposed Rulemaking (NPRM) for 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards (76 FR 748S4, December 1, 2011). Volkswagen requests that the comment period be extended from January 30, 2012 to February 29, 2012. [EPA-HQ-OAR-2010-0799-1309-A1, p.1]

The reasons to extend the comment period are compelling. [EPA-HQ-OAR-2010-0799-1309-A1, p.1]

• The regulation is extremely long, complex and costly. Sufficient time is required for all stakeholders to thoroughly review the regulation and all the supporting documents that detail the agency analysis that has led to the proposal published on December 1, 2011. While the overall program was outlined earlier this year with the publication of the Supplemental Notice of Intent (SNOI), there are many aspects of the joint regulation that are available for the very first time with the publication of the NPRM. [EPA-HQ-OAR-2010-0799-1309-A1, p.1]

• During the month of January EPA and NHTSA have scheduled 3 hearings to present this complex regulation to the public and allow all stakeholders a chance to comment on the details of the regulation. The short time frame between the hearings and the close of the comment period and the fact that discussions that result from the hearings may also need to be addressed in stakeholder comments lends additional need for an extension. [EPA-HQ-OAR-2010-0799-1309-A1, p.2]

• This joint regulation from EPA and NHTSA also coincides with a lengthy and complex regulation issued by the state of California. The proposed regulation from California, in addition to detailing their version of the Greenhouse Gas regulation that will be part of the National Program, also proposes complex and costly regulations for criteria pollutants, evaporative emissions, the California 2EV Program, changes to certification fuel and the Clean Fuels Outlet Program. [EPA-HQ-OAR-2010-0799-1309-A1, p.2]

• Ninety day comment periods are typical and are appropriate given the size and scope of this regulation and the sheer volume of supporting documents. [EPA-HQ-OAR-2010-0799-1309-A1, p.2]

• A 30 day extension should have no impact on the timing for the publication of the final regulation. [EPA-HQ-OAR-2010-0799-1309-A1, p.2]

<u>Response:</u>

EPA in fact extended the public comment period in response to the above requests.

24. Comments Regarding PSD/Title V Implications and Pending GHG Lawsuits

Organizations Included in this Section

American Fuel and Petrochemical Manufacturers (AFPM)
American Petroleum Institute (API), National Association of Manufacturers (NAM), and American Fuel & Petrochemical Manufacturers (AFPM)
National Association of Manufacturers (NAM)
Utility Air Regulatory Group (UARG)

Organization: American Fuel and Petrochemical Manufacturers (AFPM)

I. EPA's GHG CAFE Standards are Under Judicial Review. [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

The legal effect of EPA's original light-duty vehicle GHG regulation is under judicial review and the implications of that challenge likely will impact this rulemaking. Extensive, unreasonably stringent GHG emissions standards for light-duty vehicles (LDVs) are not required by statute or by the 2007 U.S. Supreme Court decision in Massachusetts v. EPA. Although section 102 of the Energy Independence and Security Act of 2007 (Public Law 110-140, hereinafter EISA) requires the Secretary of Transportation to establish automobile fuel economy standards for model years through 2020, there is no statute requiring EPA to set GHG emission standards for LDVs. While section 202(a) of the Clean Air Act (CAA) requires the Administrator of EPA to set standards "which in [her] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare," the CAA does not require excessive or stretch standards. [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

On April 2, 2007, the U.S. Supreme Court held that EPA has the statutory authority to regulate GHG emissions from new motor vehicles. Although the Supreme Court recognized that EPA has "significant latitude as to the manner, timing, [and] content" of its regulations, this Supreme Court decision in 2007 did not mandate GHG emissions rulemakings. [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

EPA is involved in at least four related lawsuits: [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

• GHG endangerment, [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

• GHG/CAFE standards for LDVs (MYs 2012-2016), [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

• GHG Prevention of Significant Deterioration (PSD) "tailoring," and [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

• GHG PSD, review of 12/18/08 "Johnson memo" - also called "grounds arising after." [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

Oral argument is scheduled for February 28 and 29, 2012 by the U.S. Court of Appeals for the D.C. Circuit for all four of these lawsuits. A decision is expected in 2012 and will have ramifications for a final rule for LDVs beginning with MY 2017. Judicial decisions on all four lawsuits are likely before EPA and NHTSA promulgate a joint final rule for LDVs after MY 2016. Therefore, this proposal for MYs after 2016 is premature and presumptive. [EPA-HQ-OAR-2010-0799-9485-A1, p.2]

EPA's LDV rule for MYs 2012-2016 has been challenged as arbitrary, capricious, and otherwise not in accordance with law because EPA: (1) failed to address the broad consequences for stationary sources that automatically result from that rule; (2) refused to analyze the extraordinary burdens on other source categories imposed by that rule; (3) failed to give meaningful consideration to the option of deferring regulation; and (4) failed to justify its rule by articulating any rational connection between the alleged endangerment and EPA's selected standards. EPA should delay promulgation of this rule to fully consider the implications of this judicial review. The agency's LDV proposal is similarly arbitrary and capricious in its failure to address these problems for LDVs with MYs after 2016. [EPA-HQ-OAR-2010-0799-9485-A1, pp.2-3]

As a result of its improper interpretation of the Clean Air Act, EPA has also asserted that the LDV rule for MYs 2012-2016 triggers an obligation to regulate GHG emissions from stationary sources under the Prevention of Significant Deterioration (PSD) and Title V permitting programs. AFPM strongly opposes any approach to implementing mobile source standards that could impact such a wide swath of unrelated stationary sources. AFPM has filed joint comments with American Petroleum Institute and the National Association of Manufacturers that address the proposed rule's potential impact on stationary sources and explain why EPA's improper interpretation renders the rulemaking arbitrary and capricious. We hereby incorporate by reference those joint comments in this submission. In short, EPA should not assert that this rule acts as an independent trigger for the PSD program, requiring regulation of GHG emissions from stationary sources, particularly in the face of an imminent court decision vacating elements of EPA's existing GHG regulatory regime. [EPA-HQ-OAR-2010-0799-9485-A1, p.3]

Organization: American Petroleum Institute (API), National Association of Manufacturers (NAM), and American Fuel & Petrochemical Manufacturers (AFPM)

Regardless of the substance and stringency of the actual greenhouse gas (GHG) standards that EPA proposes to impose on light-duty vehicles, the Associations strongly oppose any approach to implementing mobile source standards in a manner that impacts a wide swath of unrelated stationary sources.1 As of January 2, 2011, as a result of a prior rulemaking for model year 2012-2016 light-duty vehicles, EPA has begun imposing significant and unprecedented GHG permitting requirements on stationary sources around the nation. It has accomplished this through "four related actions that, taken together, trigger [permitting requirements] for GHG sources on and after January 2, 2011." Action to Ensure Auth. to Issue Permits under the Prevention of Significant Deterioration Program to Sources of Greenhouse Gas Emissions: Finding of Substantial Inadequacy and SIP Call (Proposed SIP Call), 75 Fed. Reg. 53,892, 53,895 (Sept. 2, 2010) (emphasis added). These four actions are: [EPA-HQ-OAR-2010-0799-9509-A1, p. 2]

- the “Endangerment Finding,” Endangerment and Cause or Contribute Findings for GHGs under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009);
- the “Car Rule,” Light-Duty Vehicle GHG Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25,324 (May 7, 2010);
- the “PSD Interpretive Memorandum,” Reconsideration of Interpretation of Regulations that Determine Pollutants Covered by Clean Air Act Permitting Programs, 75 Fed. Reg.
- 17,004 (April 2, 2010); and
- the “Tailoring Rule,” Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514, 31,557 (June 3, 2010). [EPA-HQ-OAR-2010-0799-9509-A1, p. 2]

EPA explained that, in its view, the Car Rule regulations, “when they [took] effect on January 2, 2011, . . . subject GHGs emitted from stationary sources to” permitting requirements. Proposed SIP Call, 75 Fed. Reg. at 53,892. [EPA-HQ-OAR-2010-0799-9509-A1, p. 3]

As explained in the Associations’ comments on each of these four actions, EPA’s decision to impose GHG permitting requirements on stationary sources as a result of the implementation of mobile source standards is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law” as well as being adopted “without observance of procedure required by law.” 42 U.S.C. § 9607(d)(9)(A),(D). Consequently, the Associations, as part of a coalition of trade associations, have petitioned the United States Court of Appeals for the District of Columbia Circuit to review each of the four related actions, that, in EPA’s view, trigger GHG permitting requirements. See National Association of Manufacturers et al. v. EPA, D.C. Cir Nos. 10-1044, 10-1127, 10-1166, 10-1218. The Associations have also challenged other EPA regulations that EPA has suggested could have a role in triggering GHG permitting requirements. See National Association of Manufacturers et al v. EPA, D.C. Cir. Nos. 10-1177, 10-1178, 10-1179, 10-1180. Oral argument is scheduled in these cases for February 28 and 29, 2012. [EPA-HQ-OAR-2010-0799-9509-A1, p. 3]

EPA has taken additional action by promulgating the “Truck Rule,” Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles, 76 Fed. Reg. 57,106 (Sept. 15, 2011). The Truck Rule is analogous to the Car Rule in that it sets standards for the quantity of GHGs that a vehicle may emit for a given amount of distance covered or work performed. Id. at 57,115. In the likely event that the Car Rule is vacated by the D.C. Circuit, EPA may continue to assert that the Truck Rule serves as a trigger for GHG permitting requirements for stationary sources. See EPA, “Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles: EPA Response to Comments Document for Joint Rulemaking,” EPA-420-11-004, at p. 2-8 (Aug. 2011). Thus, several of the Associations, as part of a coalition of trade associations, have also petitioned the United States Court of Appeals for the District of Columbia Circuit to review the Truck Rule. See American Petroleum Institute et al v. EPA, D.C. Cir No. 10-1440. That case has not yet been briefed or set for argument. [EPA-HQ-OAR-2010-0799-9509-A1, p. 3]

Like the initial Car Rule, the 2017 Car Rule sets standards for the quantity of GHGs that a vehicle may emit for a given distance travelled. 2017 Car Rule, 76 Fed. Reg. 74,976. In the context of the initial car rule, EPA inappropriately and illegally took the position that the Car

Rule triggers GHG permitting requirements for stationary sources. Consequently, as it did in the Car Rule and Truck Rule dockets, the Associations submit these comments explaining why it is arbitrary and capricious or otherwise unlawful for EPA to adopt the 2017 Car Rule while maintaining its illegal interpretation that Clean Air Act (CAA) permitting requirements for stationary sources are triggered by vehicle emissions standards such as those proposed here or adopted in the Car Rule and Truck Rule. [EPA-HQ-OAR-2010-0799-9509-A1, p. 3]

EPA has not yet asserted that this rulemaking would independently have the same triggering effect on stationary source GHG regulations as the Car Rule and Truck Rule despite the fact that it also seeks to regulate GHG emissions from the transportation sector. 2017 Car Rule, 76 Fed. Reg. 74,963. In general, EPA's position is that "any impacts on stationary sources arise because of express statutory requirements in the CAA, not as a result of vehicle regulation. Moreover, GHGs have become subject to regulation under the CAA by virtue of other regulatory actions taken by EPA before this proposal." Id. at 75,162. In the final 2017 Car Rule, EPA should clarify whether, in the likely event that the Car Rule and Truck Rule are vacated, it would cite to the 2017 Car Rule as an independent trigger for GHG stationary source permitting requirements. [EPA-HQ-OAR-2010-0799-9509-A1, pp. 3-4]

As explained below, finalizing the 2017 Car Rule would be arbitrary and capricious and unlawful because EPA has not corrected its interpretation of the CAA to provide that vehicle emission standards do not trigger GHG stationary source permitting requirements. Thus, EPA should not finalize the 2017 Car Rule with an incorrect interpretation of the CAA. In the alternative, the NHTSA standards would realize equivalent GHG reductions without CAA ramifications on stationary sources. Further, EPA has not considered the costs or ramifications that the 2017 Car Rule will impose on stationary sources by triggering GHG permitting requirements in violation of numerous laws and Executive Orders, as well as the Administrative Procedure Act. Lastly, finalizing the 2017 Car Rule would also be arbitrary and capricious and unlawful because the rule is predicated on an invalid endangerment finding. [EPA-HQ-OAR-2010-0799-9509-A1, p. 4]

The Associations further elaborate on these issues below. They also incorporate by reference here each of the comments that they submitted on the actions that comprise EPA's regulatory scheme to impose PSD permitting requirements as a result of mobile source standards2 as well as their Petition to Reconsider, Rescind and/or Revise EPA's Prevention of Significant Deterioration Regulations. Because EPA is relying on a similar flawed approach and interpretation in the context of the 2017 Car Rule, the Associations' positions in those comments are germane here and are incorporated herein in their entirety. These comments, hereby submitted as comments to the 2017 Car Rule docket, are attached as Exhibits A through J, and should be considered as part of and incorporated into the Associations' submission of comments to the 2017 Car Rule. Below, the Associations summarize key positions but do not waive the more complete set of arguments made in the comments in the five rulemakings and attached herein. [Exhibits A through J can be found on pp. 12-397 of Docket number EPA-HQ-OAR-2010-0799-9509-A1] [EPA-HQ-OAR-2010-0799-9509-A1, p. 4]

I. EPA Must Correct Its Mistaken View That Mobile Source Emission Standards Trigger GHG Permitting Requirements

EPA has stated that, in its view, the Car Rule's vehicle emission standards took effect on January 2, 2011, and as a result triggered GHG permitting requirements for stationary sources as of that date under two programs: the Title V operating permit program; and the Prevention of Significant Deterioration (PSD) pre-construction permit program. PSD Interpretive Rule, 75 Fed. Reg. at 17,019–20. EPA has not expressly announced whether it would take the same position regarding the vehicle emission standards proposed in the 2017 Car Rule. Instead, it has simply asserted that "GHGs have become subject to regulation under the CAA by virtue of other regulatory actions taken by EPA before this proposal." 76 Fed. Reg. 75,162 n.597. But to the extent EPA believes that regulations of GHGs from model year 2017-2025 light-duty vehicles, like those from model year 2012-2016 light-duty vehicles, trigger stationary source permitting ramifications, such position is inconsistent with the CAA, as explained below. [EPA-HQ-OAR-2010-0799-9509-A1, p. 4]

A. The Title V Operating Permit Program and the PSD Preconstruction Permit Program

Added by Congress in the 1990 amendments, CAA Title V requires a source that emits, or has the potential to emit, more than 100 tpy of any air pollutant to obtain an operating permit that lists applicable regulatory requirements. See, e.g., 42 U.S.C. §§ 7661a(b), 7661c. [EPA-HQ-OAR-2010-0799-9509-A1, p. 5]

The PSD program is significantly more complex. It was designed to help states maintain the National Ambient Air Quality Standards (NAAQS) prescribed by EPA for specific air pollutants known as "criteria pollutants." Under CAA § 107, EPA establishes geographic air quality districts and designates them as (a) in attainment, (b) in non-attainment, or (c) unclassifiable for each criteria pollutant. 42 U.S.C. § 7407(d). The CAA treats areas designated attainment and unclassifiable for a particular pollutant—hereinafter "attainment areas"— identically for PSD purposes. States apply NAAQS to individual stationary sources through a State Implementation Plan (SIP) "for each 'air quality control region' within the state," which ensures that the region meets the applicable NAAQS. Alabama Power Co. v. Costle, 636 F.2d 323, 346 (D.C. Cir. 1979); 42 U.S.C. § 7410. [EPA-HQ-OAR-2010-0799-9509-A1, p. 5]

Congress enacted the PSD program to prevent "a decline of air quality to the minimum level permitted by NAAQS." Wisconsin Elec. Power Co. v. Reilly, 893 F.2d 901, 904 (7th Cir. 1990). Consequently, it requires a facility in an attainment area for a specific criteria pollutant to obtain a pre-construction permit when it has the potential to emit more than the CAA threshold for that pollutant, either 100 or 250 tons per year (tpy), depending on the source. 42 U.S.C. §§ 7471, 7475(a), 7479. No construction may begin on a new or modified source until a final PSD permit is obtained. Sources subject to PSD must adopt Best Available Control Technology (BACT) for emissions of pollutants "subject to regulation" under the CAA. 42 U.S.C. § 7475(a). [EPA-HQ-OAR-2010-0799-9509-A1, p. 5]

EPA's view that mobile source emission standards trigger GHG permitting requirements hinges on this final point—that sources subject to PSD permitting must adopt BACT for pollutants "subject to regulation" under the CAA. EPA argues that GHGs became "subject to regulation" under the CAA when the Car Rule took effect because that rule imposed GHG emission standards. PSD Interpretive Rule, 75 Fed. Reg. at 17,019–20. Consequently, EPA asserted that, starting January 2, 2011, stationary sources that require a PSD permit must adopt the BACT for GHGs. Id. As explained in Section I.C. below, that argument is mistaken—mobile source emission standards do not make GHGs subject to regulation for purposes of the PSD program. [EPA-HQ-OAR-2010-0799-9509-A1, p. 5]

EPA goes even further, however, arguing that GHG emissions, standing alone, may trigger the need for a PSD permit. Tailoring Rule, 75 Fed. Reg. 31,560-62. As explained in Section I.B. below, this violates the plain text of the CAA. Briefly, as noted above, PSD permits are only required in "attainment areas." 42 U.S.C. § 7471. And areas are only designated "attainment" in reference to a NAAQS. 42 U.S.C. § 7407(d). Thus, it is logically impossible for there to be "attainment areas" for GHG, and so GHG emissions cannot necessitate a PSD permit. That is, even if EPA is correct that a source that already must obtain a PSD permit due to emissions of other pollutants for which the area is in attainment must therefore adopt BACT for GHGs, that does not mean that GHGs can trigger the prerequisite need for a PSD permit. [EPA-HQ-OAR-2010-0799-9509-A1, p. 5]

B. A Source Triggers PSD Permitting Only if it Emits a NAAQS Pollutant in an Area Designated Attainment for That Pollutant

CAA Section 107(d) establishes the process of designating an area as "attainment," "nonattainment," or "unclassifiable" for each pollutant for which "a new or revised [NAAQS]" has been issued. 42 U.S.C. § 7407(d). Section 107(d) thus explicitly links the designation determinations exclusively to NAAQS criteria pollutants. In turn, Section 107's designation determinations are the critical prerequisite to determining if the PSD program is triggered. [EPA-HQ-OAR-2010-0799-9509-A1, p. 6]

CAA Section 161, the first substantive provision of Part C (the PSD provisions), incorporates those prerequisites by limiting the PSD program to areas designated under Section 107 as attainment or unclassifiable:

In accordance with the policy of section 7401(b)(1) of this title, each applicable implementation plan shall contain emission limitations and such other measures as may be necessary, as determined under regulations promulgated under this part, to prevent significant deterioration of air quality in each region (or portion thereof) designated pursuant to section 7407 of this title as attainment or unclassifiable. [EPA-HQ-OAR-2010-0799-9509-A1, p. 6]

42 U.S.C. § 7471 (emphasis added). These geographic limitations make sense because the purpose of the PSD program is to assure that NAAQS continue to be achieved. See 42 U.S.C. § 7410(a)(2)(C) (describing PSD permit program as "necessary to assure that [NAAQS] are achieved"). In fact, almost all of the 1977 CAA amendments focused on attainment of NAAQS, and essentially codified EPA's original PSD program, which had been focused solely on NAAQS pollutants. See S 95-127 (95th Cong., 1st Sess.), at 27; Tailoring Rule, 75 Fed. Reg. at 31,549. Finally, CAA § 165(a) limits the facilities for which a PSD permit is required to facilities constructed "in any area to which this part applies." 42 U.S.C. § 7475(a) (emphasis added). [EPA-HQ-OAR-2010-0799-9509-A1, p. 6]

Because there is no NAAQS for GHGs, no region is designated attainment or unclassifiable for GHGs. No stationary source, then, is located in a region designated attainment or unclassifiable for GHGs. Consequently, no source triggers PSD permitting simply because it emits GHGs above the statutory thresholds. The D.C. Circuit, indeed, has mandated this interpretation in Alabama Power Co. v. Costle, 636 F.2d 323 (D.C. Cir. 1980), where it held that location is the key determinant for PSD applicability. EPA had argued that PSD permitting requirements should apply not only to sources in attainment areas for a given pollutant, but to sources located any place where a new emitting facility would "adversely affect the air quality of an area to which" PSD requirements apply. Id. at 364. The Court held that EPA's reading violated the CAA's plain language: "The plain meaning of the inclusion in [Section 165, 42 U.S.C. § 7475] of the words 'any area to which this part applies' is that Congress intended location to be the key determinant of the applicability of the PSD review requirements." Id. at 365. [EPA-HQ-OAR-2010-0799-9509-A1, p. 6]

Rather than comply with the D.C. Circuit's ruling, EPA's interpretation defies it. EPA's position requires permits for a source emitting above the statutory thresholds for one pollutant as long as the source is located in an area that is in attainment for any pollutant. See 45 Fed. Reg. 52,675, 52,677 (Aug. 7, 1980) ("PSD requirements apply to any area that is "designated ... as 'attainment' or 'unclassifiable' for any pollutant for which a national ambient air quality standard exists."); 40 C.F.R. § 52.21(i)(2) (PSD "shall not apply to a major stationary source or major modification with respect to a particular pollutant if … the source or modification is located in an area designated as nonattainment under section 107"). That is no limitation at all. Every area of the country is, and always has been, in attainment for at least one criteria pollutant. Id. at 31,561. Thus, in response to Alabama Power's holding that EPA has improperly broadened the geographic confines of the PSD program, EPA actually broadened the geographic scope even further, so that, under EPA's current interpretation, it now applies to every area of the country. EPA's view defies both Alabama Power and the language of the CAA that it was interpreting. [EPA-HQ-OAR-2010-0799-9509-A1, pp. 6-7]

C. GHGs Are Not Subject to Regulation Under the PSD Program

Furthermore, Title II GHG vehicle emission standards cannot make GHGs "subject to regulation" within the meaning of the CAA's PSD program. Congress did not intend for PSD requirements to apply to unconventional, non-NAAQS pollutants, particularly GHGs. EPA readily concedes Congress did not have GHGs in mind when it formulated the PSD provisions of the Act. Tailoring Rule, 75 Fed. Reg. at 31,549, 31,555, 31,561, 31,559 n.41 (Congress "might not have appreciated the possibility that burning fossil fuels could lead to global warming"). The text of the PSD provisions and their application to GHGs bear that out. [EPA-HQ-OAR-2010-0799-9509-A1, p. 7]

The 28 source categories listed in Section 169(1) as major emitting facilities potentially subject to the PSD program are the very ones EPA thought (in 1977, when the PSD program was added) posed the greatest threat to air degradation because they emitted conventional air pollutants—that is, pollutants with local air quality impacts. Naturally, Congress included only those source categories in Section 169(1) because Congress, too, was concerned about only conventional pollutants. GHGs, by contrast, are emitted by many more categories of sources. The emissions cutoffs in Section 169(1) reflect the same concern. Whereas conventional pollutant emissions of 100 and 250 tpy are significant, GHG emissions of 100 and 250 tpy are commonplace. The thresholds make sense only if Congress envisioned only conventional pollutants as "subject to regulation." [EPA-HQ-OAR-2010-0799-9509-A1, p. 7]

The PSD program itself is geared toward conventional pollutants. The program is principally concerned with "air quality," 42 U.S.C. § 7471, that is, the air people breathe. GHG emissions have no nexus to local air quality. Instead, they are distributed globally. For that reason, PSD provisions focusing on local or regional impacts of a pollutant cannot encompass GHGs. For instance, the provisions of Sections 165(a) and (e) require air quality monitoring and air quality impact analysis. Such local monitoring and local analysis is illogical for emissions of GHGs. [EPA-HQ-OAR-2010-0799-9509-A1, p. 7]

D. EPA's Interpretation of the CAA Is Unreasonable [EPA-HQ-OAR-2010-0799-9509-A1, p. 7]

EPA's contrary interpretation, that GHGs are made subject to regulation by vehicle emissions standards, is unreasonable. EPA has admitted that its approach leads to burdens that "should be considered 'absurd results.'" Tailoring Rule, 75 Fed. Reg. at 31,517. According to EPA, its interpretation creates a scenario where "PSD permit issuance would be unable to keep up with the flood of incoming applications, resulting in delays, at the outset, that would be at least a decade or longer." 75 Fed. Reg. at 31,557. "During this time, tens of thousands of sources a year would be prevented from constructing or modifying." Id. As a result, EPA's interpretation "slow[s] construction nationwide for years, with all of the adverse effects that this would have on economic development." Id. EPA has said this outcome would be "administratively infeasible," 75 Fed. Reg. at 31,516, and would "adversely affect national economic development," id. at 31,557. As EPA has acknowledged, this outcome is absurd. Contrary to EPA's assertions, an agency interpretation of a statute that is absurd cannot also be reasonable. Courts "must reject administrative constructions of [a] statute … that frustrate the policy that Congress sought to implement." Continental Air Lines v. Dep't of Transp., 843 F.2d 1444, 1453 (D.C. Cir. 1988); see also Int'l Alliance of Theatrical & Stage Employees v. NLRB, 334 F.3d 27, 35 (D.C. Cir. 2003). EPA must, instead, adopt the reasonable interpretations proposed by the Associations. [EPA-HQ-OAR-2010-0799-9509-A1, pp. 7-8]

II. EPA Should Delay Finalizing The 2017 Car Rule Until It Has Corrected Its Mistaken Interpretation of the CAA, Allowing NHTSA to Move Forward

EPA has broad discretion to delay finalizing the 2017 Car Rule under the "rule of reason" that courts employ in assessing delay in agency decision making. Telecommunications Research & Action Center v. FCC, 750 F.2d 70, 80 (D.C. Cir. 1984); see also Massachusetts v. EPA, 549 U.S. 497, 533 (2007) (EPA has "significant latitude as to the manner, timing, content, and coordination of its regulations with those of other agencies"). Given this discretion, it would be arbitrary and capricious for EPA to finalize the CAA component of the 2017 Car Rule at this time; instead, it should allow NHTSA to finalize the rule independently. When the D.C. Circuit vacates EPA's Car Rule and Truck Rule for the reasons stated in the Associations' Comments, see Exhs. A–J, the 2017 Car Rule could cause the same harm that the Car Rule (and Truck Rule) threatened: triggering massive and unwarranted permitting burdens. Tailoring Rule, 75 Fed. Reg. at 31,517. [EPA-HQ-OAR-2010-0799-9509-A1, p. 8]

These harms entirely outweigh any possible benefit from finalizing the rule, because the rule was jointly proposed by EPA and NHTSA. This means the NHTSA portion of the 2017 Car Rule could be finalized under NHTSA authority, avoiding triggering permitting requirements under the CAA. Consequently, delaying the EPA rule (but not the NHTSA rule) would not cause any serious disruption to implementing GHG emission standards for model years 2017-2025 light-duty vehicles, but would avoid massive harm to stationary sources. Furthermore, the delay need not be long—if EPA implemented the interpretation offered in Section I, above, it could then finalize the 2017 Car Rule without harming stationary sources. [EPA-HQ-OAR-2010-0799-9509-A1, p. 8]

III. EPA Failed to Assess the Consequences of Its Rule and Alternatives to Its Actions Rendering the Rulemakings Arbitrary and Capricious [EPA-HQ-OAR-2010-0799-9509-A1, p. 8]

Given EPA's interpretation that vehicle emissions standards trigger stationary source GHG permitting requirements, PSD Interpretive Rule, 75 Fed. Reg. at 17,019–20, EPA is required to consider the ramifications on stationary sources subject to those permitting requirements before promulgating the 2017 Car Rule. EPA has entirely failed to perform this duty—the proposed 2017 Car Rule contains no discussion of its impacts on stationary sources. Instead, it states in cursory fashion that impacts on stationary sources are attributable to EPA's upon are subject to pending legal challenges and are at risk for being vacated.3 [EPA-HQ-OAR-2010-0799-9509-A1, pp. 8-9]

EPA's refusal to consider the effects of its Rule makes the rule "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law" as well as being adopted "without observance of procedure required by law." 42 U.S.C. § 9607(d)(9)(A),(D). An agency acts arbitrarily and capriciously if it does not "examine the relevant data," Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983), or fails to make its decision "based on a consideration of the relevant factors," Bowman Transp., Inc. v. Arkansas-Best Freight Sys., Inc., 419 U.S. 281, 285 (1974). [EPA-HQ-OAR-2010-0799-9509-A1, p. 9]

Congress and the Executive Branch have directed EPA, before taking final action, to assess all the impacts of its actions and to consider the benefits of alternative approaches. Under the very section discussed, Section 202(a), regulations may only "take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period." 42 U.S.C. § 7621(a); see also Massachusetts v. EPA, 549 U.S at 529 (GHG regulation cannot be "extreme" because EPA must "delay any action to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance"). [EPA-HQ-OAR-2010-0799-9509-A1, p. 9]

IV. EPA Should Clarify Whether the 2017 Car Rule Triggers Stationary Source Impacts in the Absence of Another Trigger

The Associations believe EPA's position to be that, absent any other trigger such as the Car Rule or Truck Rule, the 2017 Car Rule will trigger applicability of the Title V and PSD programs to GHG emissions from stationary sources. Thus, for example, should the Car Rule and Truck Rule be vacated by the Court, the 2017 Car Rule would become the regulation that triggers the stationary source regulation of GHGs. If that is not EPA's position, EPA should so clarify and explain its position. [EPA-HQ-OAR-2010-0799-9509-A1, p. 10]

1 These comments do not address the substance and stringency of the actual GHG standards that EPA proposes to impose on light-duty vehicles. Each Association is filing individual comments that discuss various policy and technological impacts of the GHG standards in the 2017 Car Rule.

2 Because the Truck Rule will undoubtedly serve the same role in EPA's justifications after the Car Rule is vacated, the Associations also incorporate by reference their comments on the Truck Rule.

3 At a minimum, EPA should delay finalizing the 2017 Car Rule until after the D.C. Circuit has issued decisions in the challenges to the Car Rule and Truck Rule. Until these decisions become final, EPA cannot accurately assess the impact that the 2017 Car Rule will have on stationary sources.

Organization: National Association of Manufacturers (NAM)

In addition, the NAM, along with American Petroleum Institute and American Fuel & Petrochemical Manufacturers (Associations) have submitted joint comments on this proposed rule opposing any approach to implementing of mobile source standards that will impact a wide swath of stationary sources. We hereby incorporate by reference those joint comments in this submission. This proposed rule is the EPA's third rulemaking to regulate greenhouse gas (GHG) emissions from mobile sources, following the Light Duty Vehicle GHG Emission Standards and Corporate Fuel Economy Standards, 75 Fed. Reg. 25,324 (May 7, 2010) and Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy- Duty Engines and Vehicles, 76 Fed. Reg. 57,105 (Sept. 15, 2011). The EPA has taken the position that these mobile source standards – along with related regulations and guidance – require it to regulate GHG emissions from stationary sources under the Prevention of Significant Deterioration (PSD) and Title V Programs. Both of those rules are currently subject to judicial review and the Associations are concerned that once they are vacated the EPA will assert that this rule serves as an independent trigger for the regulation of GHG emissions from stationary sources.

In the joint comments, we explain why the EPA's view that mobile source emission standards trigger GHG permitting requirements for stationary sources is mistaken and urge it to correct its interpretation. Further, because NHTSA can issue the same mobile source standards without creating the risk of adverse impacts on stationary sources, we urge the EPA to defer any further action on the proposed rule until it corrects its interpretation, allowing NHTSA to proceed alone at this time. The joint comments also explain why the EPA's failure to consider the consequences of the proposed rule on stationary sources and alternatives to its proposed actions render the rulemaking arbitrary and capricious. Finally, we explain that the rulemaking is arbitrary and capricious because it is based on an invalid endangerment finding for GHGs that is likely to be vacated upon judicial review. [Joint comments can be found in Docket number EPA-HQ-OAR-2010-0799-9509-A1] [EPA-HQ-OAR-2010-0799-9538-A2, pp. 1-2]

Organization: Utility Air Regulatory Group (UARG)

UARG submits these comments solely for the purpose of addressing possible alleged stationary source effects under the Clean Air Act's ("CAA" or "Act") prevention of significant deterioration ("PSD") and Title V permitting programs that might result from promulgation of a final rule in the present rulemaking. [EPA-HQ-OAR-2010-0799-9510-A1, p. 1]

On May 7, 2010, EPA published a final rule establishing greenhouse gas ("GHG") emissions standards for model year 2012-2016 light-duty vehicles. 75 Fed. Reg. 25324 (hereinafter the "2012 Light-Duty Rule"). EPA has adopted an interpretation of the CAA under which promulgation of the 2012 Light-Duty Rule made GHGs subject to the CAA's PSD and Title V permitting programs for stationary sources beginning on January 2, 2011. See Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by Clean Air Act Permitting Programs, 75 Fed. Reg. 17004 (Apr. 2, 2010) (hereinafter the "Reconsideration Rule"). EPA's regulation of GHG emissions from stationary sources under the PSD and Title V programs is the subject of considerable controversy, and every major EPA rule related to the Agency effort to require regulation of GHG emissions under those programs is, in one respect or another, the subject of pending petitions for review filed in the U.S. Court of Appeals for the District of Columbia Circuit by numerous parties, including UARG. See, e.g., Coalition for Responsible Regulation, et al. v. EPA, No. 09-1322 (and consolidated cases) (D.C. Cir.) (petitions for review of EPA's GHG "endangerment" and "cause or contribute" findings for motor vehicles under CAA section 202(a)); Coalition for Responsible Regulation, et al. v. EPA, No. 10-1073 (and consolidated cases) (D.C. Cir.) (petitions for review of the Reconsideration Rule); Coalition for Responsible Regulation, et al. v. EPA, No. 10-1092 (and consolidated cases) (D.C. Cir.) (petitions for review of the 2012 Light-Duty Rule); Southeastern Legal Foundation, et al. v. EPA, No. 10-1131 (and consolidated cases) (D.C. Cir.) (petitions for review of EPA's Tailoring Rule for GHGs under the PSD and Title V programs). [EPA-HQ-OAR-2010-0799-9510-A1, p. 1]

Depending on the outcome of these pending cases, it is possible that the current PSD and Title V permitting rules as they are deemed by EPA to apply to stationary sources' GHG emissions may be vacated in whole or in part or otherwise changed significantly as a result of judicial review. If that occurs, it is possible that the proposed 2017 Light-Duty Rule, if made final by EPA at the conclusion of the present rulemaking, could be interpreted by the Agency to be the rule that makes GHGs subject to the PSD and Title V permitting requirements.1 To protect its interests in the event that occurs, UARG submits the following comments to the docket for the present rulemaking: [EPA-HQ-OAR-2010-0799-9510-A1, p. 2]

- The proposed 2017 Light-Duty Rule relies on EPA's final endangerment and "cause or contribute" findings for GHGs under section 202(a) of the Act, which EPA published at

74 Fed. Reg. 66496 (Dec. 15, 2009); see, e.g., 76 Fed. Reg. at 74861, 74964. UARG filed three sets of comments on EPA's proposed endangerment and cause or contribute findings under section 202(a): (1) Comments of the Utility Air Regulatory Group on the Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, EPA Docket ID No. EPA-HQ-OAR-2009-0171-3394.1 (Attachment 1 to these comments [Attachment 1 can be found on pp. 5-265 of Docket number EPA-HQ-OAR-2010-0799-9510-A1]); (2) Supplemental Comments of the Utility Air Regulatory Group on the Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, EPA Docket ID No. EPA-HQ-OAR-2009-0171-4932.1 (Attachment 2 to these comments [Attachment 2 can be found on pp. 266-279 of Docket number EPA-HQ-OAR-2010-0799-9510-A1]); and (3) the Utility Air Regulatory Group's Additional Supplemental Comments on the Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, EPA Docket ID No. EPA-HQ-OAR-2009-0171-11491.1 (Attachment 3 to these comments [Attachment 3 can be found on pp. 280-291 of Docket number EPA-HQ-OAR-2010-0799-9510-A1]). UARG incorporates all of these comments herein by reference. [EPA-HQ-OAR-2010-0799-9510-A1, p. 2]

- As discussed in UARG's previous comments incorporated herein, the proper purpose of any EPA endangerment finding under the CAA is to avert or prevent the danger the Agency concludes is presented by the emissions that are the subject of the finding, or at least to significantly mitigate that danger. This principle is reflected in the CAA's legislative history and the decision in Ethyl Corp. v. EPA, 541 F.2d 1 (D.C. Cir. 1976) (en banc). As the legislative history and Ethyl make clear, the fundamental purpose of the CAA provisions that incorporate the endangerment criterion, such as section 202(a)(1), is to authorize regulation of emissions when and to the extent such regulation will be effective in fruitfully attacking the cause of the endangerment, and not to impose "regulation for regulation's sake." The proposed 2017 Light-Duty Rule does not meet this standard. EPA analyzed the reductions in GHG emissions that would result from the proposed 2017 Light-Duty Rule by the year 2100 and projected the effects those reductions would have on atmospheric carbon dioxide concentrations, global mean surface temperature, sea-level rise, and ocean-water acidity. 76 Fed. Reg. at 75097-99 & Table III-62. EPA acknowledges that "[t]he projected reductions are small." Id. at 75099. EPA makes the following projections for the year 2100 as a result of the proposed 2017 Light-Duty Rule: (1) atmospheric carbon dioxide concentrations will be reduced by 3.29 to 3.68 parts per million by volume; (2) global mean surface temperature will be reduced by 0.0076°C to 0.0184°C; (3) sea-level rise will be reduced by 0.074 to 0.166 centimeter; and (4) ocean pH will increase by 0.0018 pH unit. Id. at 75097-99 & Table III- 62. These amounts constitute a minuscule fraction of changes projected by the Intergovernmental Panel on Climate Change, on whose reports EPA relies. See, e.g., id. at 75096, 75098 & nn.385, 386. Even assuming that EPA's proposed 2017 Light-Duty Rule would achieve the maximum EPA-projected reductions, these reductions are vanishingly small, to the point of being all but unquantifiable and, in any event, imperceptible on any human scale. Thus, the proposed 2017 Light-Duty Rule does not meet the Ethyl standard for regulation under section 202. See Attachment 3; Comments of the Utility Air Regulatory Group on the Proposed Rulemaking To Establish Light-Duty Vehicle Greenhouse Gas Emission

Standards and Corporate Average Fuel Economy Standards, EPA Docket ID No. EPA-HQ-OAR-2009-0472-7262, at 7-10 (Attachment 4 to these comments; incorporated herein by reference [Attachment 4 can be found on pp. 292-329 of Docket number EPA-HQ-OAR-2010-0799-9510-A1]). [EPA-HQ-OAR-2010-0799-9510-A1, pp. 2-3]

- Furthermore, EPA appears to analyze the projected GHG emission reductions from the proposed 2017 Light-Duty Rule by including the projected GHG emission reductions that would occur from the vehicle fuel efficiency standards proposed by the National Highway Traffic Safety Administration ("NHTSA") concurrently with EPA's proposed rule. It appears that the majority of the emission reductions projected by EPA likely would occur anyway as a result of promulgation of the NHTSA fuel efficiency standards. Accordingly, the already minuscule projected effects from EPA's proposed rule, noted above, become even smaller if one excludes (as one should) the projected effects from the NHTSA standards. See Attachment 3; Attachment 4 at 10-15. [EPA-HQ-OAR-2010-0799-9510-A1, p. 3]
- If the proposed 2017 Light-Duty Rule, if made final, is interpreted by EPA to be the rule that makes GHGs subject to PSD and Title V requirements, then -- accepting arguendo such an EPA interpretation -- the date on which, according to EPA, that rule "takes effect" for purposes of commencing the applicability (in EPA's view) of PSD and Title V requirements to GHGs should be no earlier than the date on which the applicable model year begins pursuant to NHTSA rules or practice, i.e., October 1 of the preceding calendar year (e.g., October 1, 2016, for model year 2017). See Utility Air Regulatory Group Petition for Reconsideration and Request for Administrative Stay, EPA Docket ID No. EPA-HQ-OAR- 2009-0597, at 11-13 (June 1, 2010) (Attachment 5 to these comments; incorporated herein by reference [Attachment 5 can be found on pp. 330-350 of Docket number EPA-HQ-OAR-2010-0799-9510-A1]).2 [EPA-HQ-OAR-2010-0799-9510-A1, p. 3]
- EPA published its final Tailoring Rule on June 3, 2010. Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31514. EPA promulgated the Tailoring Rule because the Agency concluded that application of the PSD and Title V requirements to stationary sources of GHG emissions would, due to the Act's PSD and Title V applicability thresholds, produce absurd results contrary to congressional intent. For the reasons described in UARG's comments on the proposed Tailoring Rule, however, EPA instead could have avoided, and should have avoided, such results by adopting the approaches described in those UARG comments, and, in particular, by determining that carbon dioxide is excluded from the scope of the PSD requirements under the CAA and EPA's regulations. See Comments of the Utility Air Regulatory Group on the Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, EPA Docket ID No. EPA-HQ-OAR-2009-0517-5317.1, at 19-27 (Attachment 6 to these comments; incorporated herein by reference [Attachment 6 can be found on pp. 351-424 of Docket number EPA-HQ-OAR-2010-0799-9510-A1]). [EPA-HQ-OAR-2010-0799-9510-A1, pp. 3-4]

---

1 Nothing herein should be construed as suggesting that UARG would agree with any such interpretation.

2 EPA has not responded to this petition.

Response:

The District of Columbia Circuit recently held that the unambiguous language of the Clean Air Act makes stationary source permitting requirements applicable automatically to a pollutant when that pollutant is regulated under the Act (including Title II of the Act). Coalition for Responsible Regulation v. EPA, No. 09-1322 (D.C. Cir. June 26, 2012), slip op. pp. 50-77. This decision expressly and implicitly rejects the arguments advanced by comments against regulation of GHG under the Prevention of Significant Deterioration (PSD) and Title V permitting programs. The court held that the PSD requirements apply to all air pollutants anywhere in the atmosphere and are not limited to only pollutants that affect public health at ground level or in local areas near the source of the air pollutants. The court rejected the argument that PSD requirements are only applicable to pollutants for which EPA has promulgated a National Ambient Air Quality Standard. The court also recognized that EPA was not required to promulgate regulations under section 166 of the Act before the permitting programs may apply to greenhouse gases.

25. Comments Unrelated to the Proposed Rule

Organizations Included in this Section

Adams, G.
Axford, H.
Climate Institute
EutecticSolutions Inc.
Green, K.
Haroldson, C.
Hohenstein, H.
Integrated Consultants, Inc.
Lipetzky, P.
Marks, R.
Marlinghaus, E.
Marshall, C.
Miller, P.
National Association of Convenience Stores (NACS)
South Coast AQMD
Statman, P.

Organization: Adams, G.

The price of gas is once again squeezing the budgets of American families, who already are forced to cut back in other areas just to pay for basic transportation needs.This needs to happen, in order to break our dependence on fossil fuel, both foreign and domestic. [EPA-HQ-OAR-2010-0799-1550-A1, p. 1]

I believe there is a lot to be said for switching FROM non-tariff regulation of pollution including greenhouse gases TO excise taxes high enough to account for all external costs. This would create LOTS of CONSUMER pressure to improve efficiency of all consumer energy-using products. If Detroit insists on producing gas hogs, they can go the way of the Edsel. It should increase demand for sustainable energy in all areas of the economy. Already, in Connecticut where consumers are allowed to choose their electric generation firm, while stuck with the distributing utility where they live, sustainable source electricity ranges from the same price as fossil fuel electricity to only about one half cent per kWh more. I believe there is a lot to be said for bribing fossil fuel firms to invest in sustainable energy by accepting such investment as payment of the excise tax on the greenhouse gas part of pollution. While sustainable energy also helps cut toxic pollution from fossil fuel, it will take so long (approximately twenty years) to replace all our fossil fuel-fired electric generators with sustainable energy electric generators that fossil fuel firms should be allowed write off each year against toxic pollution excise tax only as much toxic pollution as would be emitted by the fossil fuel being replaced by the sustainable energy generator that year. [EPA-HQ-OAR-2010-0799-1550-A1, pp. 1-2]

Organization: Axford, H.

Build More Oil Refinerys, Drill for oil and gas in America and put more people back to work!! Approve the Pipeline you have tabled, and call all the drilling bands off, and call our rigs and workwes back from South America where many have gone. Chose to be an American President, instead of a apoligetic pice of junk politics. You can not do for others what they refuse to do for themselves, stop being a fundamentel Liberal Marxtist and seek Freedom and Liberty for all our financial and religious freedoms that were established by our founders. [EPA-HQ-OAR-2010-0799-9149-A1, pp. 1-2]

Organization: Climate Institute

I also, however, would note that actions are needed to reduce emissions from all types of transportation, not just automobiles, so please keep working to do more. Making the voluntary black carbon reduction program mandatory would be a great step as well--perhaps by requiring all construction vehicles working on federally funded transportation projects to be equipped with black carbon capture equipment. This might be done by allowing the installation of black carbon filters to be a legitimate charge to the construction project, and this would have the effect of getting at the very high emissions from older, long-lasting equipment. The US per capita black carbon emissions are higher than the global average--we need to act and act now. [EPA-HQ-OAR-2010-0799-7944-A1, p. 1]

And there is more that can be done on methane--also by making voluntary programs mandatory (and many of the steps are cost effective for other reasons). So, please keep aggressively working to limit warming influences. [EPA-HQ-OAR-2010-0799-7944-A1, p. 1]

Organization: EutecticSolutions Inc.

As you are working towards reducing GHGs and improving fuel economy, don't forget the issue of HD trucks with excessive air brake leaks. Many need to idle for extended periods of time when the air supply has leaked below 60psi over night. FYI when an air brake system leaks its air below 60psi, the parking brake system comes ON and the vehicle cannot move until the pressure is built back up over 60 psi (sometimes more). A vehicle that has lost all of its air may need to idle for as much as 15 minutes before it can be moved to do useful work. [NHTSA-2010-0131-0270, p. 1]

This is not a rare occurrence and many HD trucks are operating with large leaks that technicians cannot find or repair. These vehicles use more fuel than necessary and add to the GHG issue. [NHTSA-2010-0131-0270, p. 1]

Organization: Green, K.

The price of gas is once again squeezing the budgets of American families, who already are forced to cut back in other areas just to pay for basic transportation needs. While this may be true - this situation did not have to arise! [EPA-HQ-OAR-2010-0799-1524-A1, p. 1]

The introduction of mandatory bio-fuel quotas has been a tragic and immoral mistake that has enriched a few and brought hunger to many! It is not an answer that can prevail for very long! [EPA-HQ-OAR-2010-0799-1524-A1, p. 1]

America has, within its borders, immense potential for energy independence. It has the opportunity to purchase even more fossil fuel from a friendly neighbor, Canada. Look realistically at the future and devise a more intelligent Energy Plan! [EPA-HQ-OAR-2010-0799-1524-A1, p. 1]

Organization: Haroldson, C.

Instead, let's increase our domestic drilling for oil and reduce our dependence on foreign oil. Of course this is a much safer alternative than shipping oil from the middle east and it will also create jobs at home. [EPA-HQ-OAR-2010-0799-11137-A1, p. 1]

Organization: Hohenstein, H.

I support greater drilling in America to reduce U.S. dependence on imported oil.

The price of gas is once again squeezing the budgets of American families, therefore the market will cause Americans to drive more efficient cars.

Close DOE permanently, use more CNG, drill in the productive deposits in America and allow American entrepreneurs to develop the necessary technology to buy American. [EPA-HQ-OAR-2010-0799-1515-A1, p. 1]

Organization: Integrated Consultants, Inc.

Integrated Consultants, Inc. (ICI) is a Military prototype hardware R&D firm. During our efforts on extended Battery range/life research for electric powered devices we developed a New Operator Driving Feature that Increases Vehicle Efficiency. Although initially for electric cars a modified regeneration arrangement could potentially increase the mileage range/efficiency of all vehicles. [NHTSA-2010-0131-0217, p. 1]

The issue for vehicle manufacturers becomes the adoption of a new indicator standard for vehicles, and vehicle safety. Manufacturers are reluctant to apply non adopted options that could affect vehicle safety, and efficiencies that can be easily leveraged are being abandoned. As electric vehicles and electric assist motor vehicles proliferate, the adoption of a standard will be required from a motor vehicle operator safety standpoint. [NHTSA-2010-0131-0217, p. 1]

ICI has been researching this topic for over 2 years, and we believe the regenerator slowing indicator is a more significant indicator than the high center “third brake light”. Could someone kindly visit http://www.integratedconsultants.com/ and view the data listed on our home page. [NHTSA-2010-0131-0217, p. 1]

Organization: Kobus, D.

We must stop the PetroChemical/Agribusiness lock on the direction of our nation and future. Healthcare, the environment, and energy can all be targeted through correcting the nation's food sources. We must stop targeting extreme energy sources (oil sands, hydrofracturing, deep ocean drilling), GMOs, and nanoparticles. We are launching full-on into realms of science that are untested and unsafe in standard scientific terms. It is not right, and it is our right as Americans to say so. [EPA-HQ-OAR-2010-0799-1370-A1, p. 2]

Organization: Lipetzky, P.

Just think what we can do for the economy RIGHT NOW if we lower gas by $1/gallon. Let's focus on the economy NOW. [EPA-HQ-OAR-2010-0799-8184-A1, p. 1]

Organization: Marks, R.

We need an immediate $1.00 per gallon tax on gas, followed each year for the next 8 years with an additional $0.50. This sets a long term term vision to start to change our wasteful habits. This tax money needs to be strictly allocated with public oversight, to develop alternative energy sources - 35%, build mass transit - 20%, into infrastructure of roads and rails - 10%, help those caught in the cost shift - 25% going to 0% and rebuild our cities - 10% going to 35%. If you want to extend to dirty coal used in electricity generation, now is the time to tax it. [EPA-HQ-OAR-2010-0799-1680-A1, p. 1]

Organization: Marlinghaus, E.

The price of gas is once again squeezing the budgets of American families, who already are forced to cut back in other areas just to pay for basic transportation needs. But, what the American people don't seem to realize, is that the price of gas is this country is really way below what it should be. If all the real costs of our addiction to oil were factored in, the true cost of a gallon of gasoline would be at least 2-3 times the current price. I can't help but believe that if even a portion of these costs were allowed to be added in that our government, bolstered by the insistence of the American public, would finally get their priorities straight and demand that our automotive industry make fuel economy their highest priority. [EPA-HQ-OAR-2010-0799-1581-A1, p. 1]

Organization: Marshall, C.

It may also be a good idea to encourage that highway funds be switched from a tax on gasoline to a tax on vehicle miles traveled. As less gasoline is used to meet this standard, fewer revenues will come into the highway funding programs. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Organization: Miller, P.

The price of gas is once again squeezing the budgets of American families, who already are forced to cut back in other areas just to pay for basic transportation needs. We need to move ahead much more strongly! [EPA-HQ-OAR-2010-0799-1755-A1, p. 1]

Organization: National Association of Convenience Stores (NACS)

Cost of Satisfying the RFS

Currently, the market is struggling to accommodate the 'blend-wall,' that point beyond which traditional blends of E10 and E85 cannot satisfy the mandated volumes of the RFS. EPA has sought to relieve this pressure for a short period of time by authorizing the sale of E15 for vehicles manufactured in and after model year 2001. However, automobile manufacturers are concerned that even these vehicles are not suitable for this fuel and there is ongoing litigation concerning the authorization to use E15. [EPA-HQ-OAR-2010-0799-9543-A1, p. 3]

For retailers, the challenge is two-fold: equipment compatibility and consumer demand.

Current federal law requires retail equipment to be listed by a nationally recognized testing laboratory as compatible with the fuel they wish to sell. The vast majority of equipment, however, is listed as compatible with fuels containing no more than 10% ethanol. Underwriters Laboratories (most equipment is listed by Underwriters Laboratories) does not recertify equipment after it has been manufactured. Consequently, retailers wishing to sell fuels containing more than 10% ethanol are required to replace their underground storage tank systems and dispensers with equipment that is certified as compatible with the new fuels. This is an extremely costly proposition. Underground storage tank systems can cost $100,000 to $200,000 and dispensers can cost up to and above $20,000 per unit. Retailers interested in pursuing a fuel like E15 may find the investment difficult to justify, especially considering the automobile manufacturers' opposition to the fuel and the uncertainty regarding consumer demand. [EPA-HQ-OAR-2010-0799-9543-A1, p. 3]

Similar equipment compatibility conditions apply for E85. However, there is the additional concern regarding consumer demand. At the end of 2010, the number of flexible fuel vehicles (FFVs), which are designed to operate on fuels containing between 0% and 85% ethanol, represented only 3.6% of the market. By 2025, EIA projects FFVs will represent only 16% of the vehicles on the market. Further, FFV customers, who have the ability to purchase regular gasoline or E85, for a variety of reasons often do not purchase E85 when available. Consequently, this is a very limited potential market and this can dissuade retailers from making the considerable investment to upgrade a facility to sell E85. [EPA-HQ-OAR-2010-0799-9543-A1, p. 3]

These are the current challenges associated with overcoming the blend-wall that exists in 2012. With the proposed CAFE revisions, the problem becomes exponentially more serious over the next 10 years. By 2022, to satisfy the RFS every gallon of gasoline must contain nearly 40% renewable fuels. This means that every fuel retailer will be required to replace all of their fueling equipment. This will cost the industry billions of dollars. [EPA-HQ-OAR-2010-0799-9543-A1, p. 3]

The average convenience store selling fuel operates four dispensers and two underground storage tanks. Assuming the average price for a dispenser is $20,000 and the average price for a new underground storage tank system is $100,000, the typical store will be required to invest $180,000 to accommodate the fuels required by the RFS. Multiply the per-store total by the 120,950 convenience stores that sell fuels and the industry-wide cost is staggering: $21.7 billion. After this enormous investment, it may still be impossible to satisfy the RFS considering that only one in six consumers will drive vehicles capable of running on the mandated fuels: EIA projects only 16% of consumers will drive FFVs by 2035. [EPA-HQ-OAR-2010-0799-9543-A1, p. 3]

Of the 120,950 convenience stores that sell fuel, 58% are one-store companies and fewer than 1% are owned by an integrated oil company. Therefore the burden for satisfying the RFS under the new CAFE standards will fall squarely on the small businesses that dominate the fuels retailing market and many will likely go out of business. [EPA-HQ-OAR-2010-0799-9543-A1, p. 4]

Conclusion

NACS members strongly support efforts to enhance the nation's energy security and do not oppose improving the fuel efficiency of the nation's vehicle fleet. However, they are very concerned that the policies being enacted and proposed are not effectively coordinated. The effect of the proposed rule on overall fuel consumption in the United States will greatly exacerbate the difficulties associated with implementation of the Renewable Fuels Standard. NACS members are concerned that this incompatibility has not been recognized or considered by the Agency. [EPA-HQ-OAR-2010-0799-9543-A1, p. 4]

Further, NACS is concerned that if policies like these cannot be designed in a manner that compliments rather that compromises the other, countless small businesses will be forced to examine whether they want to spend the money for upgrades or exit the business. Either way, the consumer ultimately loses. [EPA-HQ-OAR-2010-0799-9543-A1, p. 4]

NACS urges EPA to consider the implications of this proposed rule on other regulatory requirements already affecting not just the automobile industry but the fuels industry as well. NACS does not believe that improved efficiency, enhanced sustainability, national energy security and economic growth are mutually exclusive objectives. But if they are not pursued in a strategic, coordinated effort they can lead to unintended consequences that can derail progress towards all of the objectives. [EPA-HQ-OAR-2010-0799-9543-A1, p. 4]

Organization: South Coast AQMD

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 70-71.]

Lastly, we urge U.S. EPA to begin analysis to set criteria and greenhouse gas emissions standards for vehicles produced after 2025. It is critically important, given that many areas in the

U.S. must meet the new eight-hour ozone standard and the potential for ever tighter ambient air quality standards.

Organization: Statman, P.

The price of gas is once again squeezing the budgets of American families, who already are forced to cut back in other areas just to pay for basic transportation needs. [EPA-HQ-OAR-2010-0799-1472-A1, p. 1]

Response:

These comments, although clearly sincere, concern issues beyond the scope of this rulemaking and therefore no response is necessary.