Federal Clean Fuel Standards – Past, Present and Future

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It All Starts with Clean Fuels

- Clean fuels directly provide emission benefits
- More importantly clean fuels enable engine and vehicle emission control technology

Past Fuel Standards

1974	Unleaded Gasoline
1980	Gasoline Sub-Sim
1989	Phase 1 Gasoline Summer RVP Limits
1991	Phase 2 Gasoline Summer RVP Limits (9.0 and 7.8)
1992	Winter Oxyfuels Program (39 cities)
1993	Highway diesel fuel sulfur control (500 ppm)
1995	Phase 1 RFG and Anti-dumping
1995	Gasoline Detergent Additives Fuel and Fuel Additives Registration
1996	Prohibition on lead
2000	Phase 2 RFG
2002	Mobile Source Air Toxics (MSAT1)
2004	Tier 2 Gasoline Sulfur Control (30 ppm avg, 80 cap)

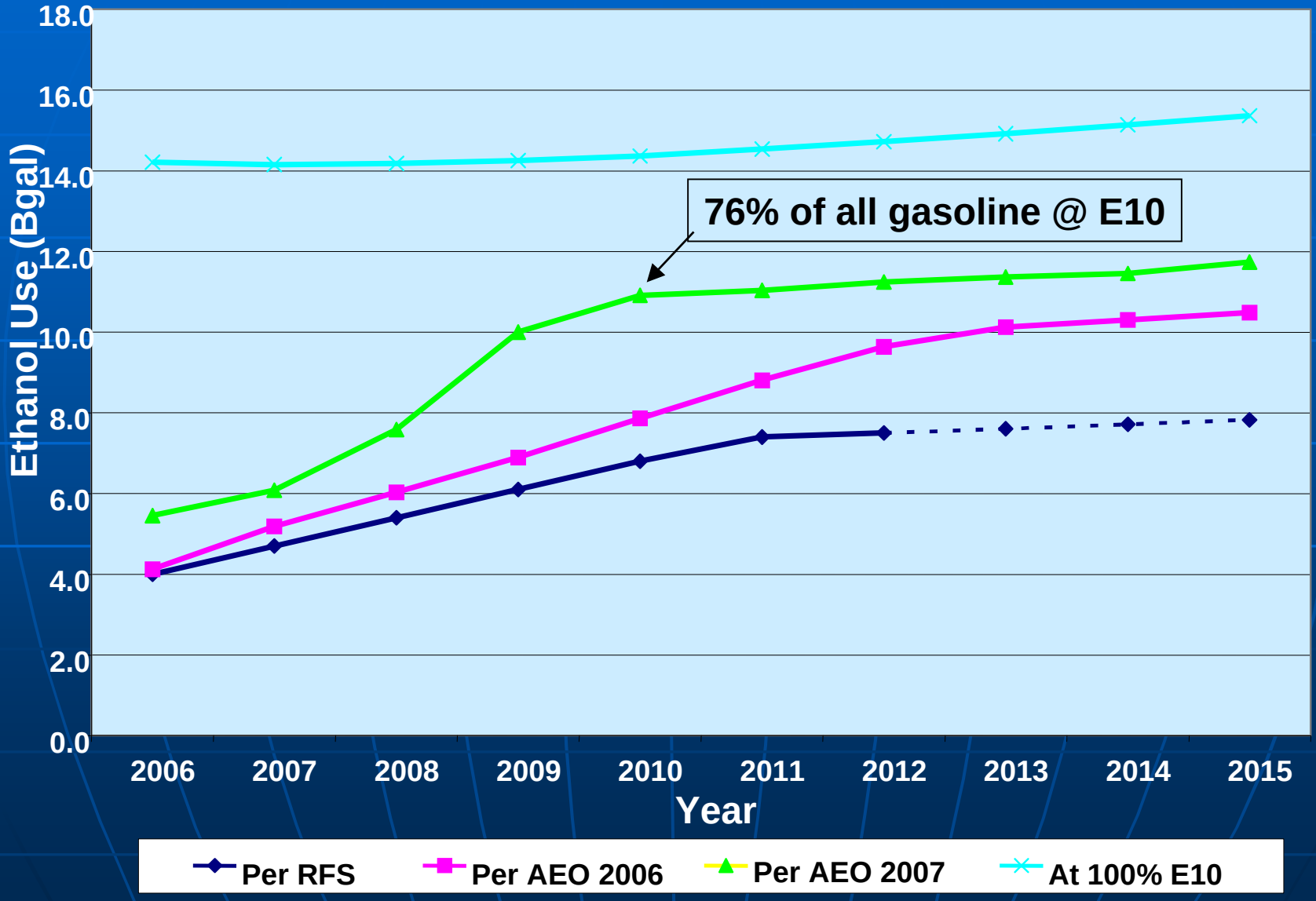
New Fuel Standards

2006	Renewable Fuels Standard - Default
2006	Removal of RFG Oxy Mandate
2006	Ultra-low Sulfur Highway Diesel Fuel (15 ppm)
2006	Boutique Fuels List
2007	Nonroad, Locomotive and Marine Diesel Fuel (500 ppm)
2007	Renewable Fuels Standard – Full Rule (proposed)
2010	Ultra-low Sulfur Nonroad Diesel Fuel (15 ppm)
2011	MSAT2 -Gasoline benzene
2012	Ultra-low Sulfur Locomotive and Marine Diesel Fuel (15 ppm)

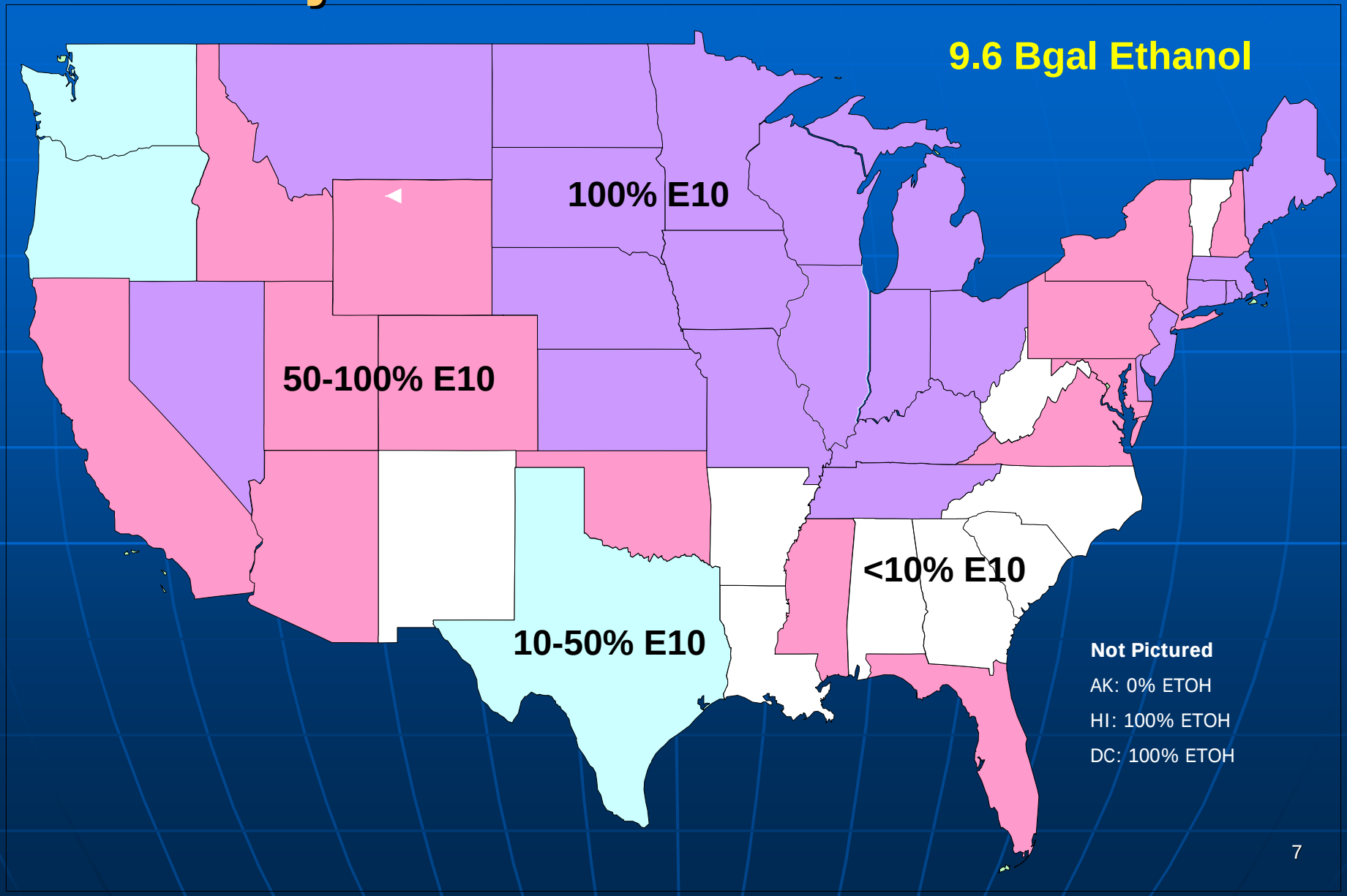
Biofuels play a growing role in the U.S. energy portfolio.

- Biofuels must take advantage of market efficiencies in order to grow with future market demands.
- Biofuels can be used to achieve national goals of greenhouse gas reduction and energy security.
- Biofuels should play a positive role in environmental quality.

Ethanol is the most popular biofuel in the U.S.



Projected ethanol use in 2009



Use systems approach when thinking about standards

- In order to appropriately address environmental issues, we need to keep in mind the complete system when setting standards for biofuels

Engine + Fuel + Emissions control

Biofuels standards harmonization

- Build upon existing regulatory framework
- Address concerns over operational and environmental performance of biofuels and avoid creating new ones
- Establish industry-wide fuel quality specifications to ensure high quality fuel
- Focus on harmonizing performance standards for biofuels to ensure acceptable emissions levels
- Consider consumer acceptance issues

U.S. federal agencies are investing money and time in biofuels.

- Key federal players
  - Environmental Protection Agency
  - Departments of Energy, Agriculture (USDA), Commerce (NIST)
- President has called for the use of 35 billion gallons of alternative fuels, including biofuels, by 2017
- Interagency collaboration and support for biofuels research, including developing a National Biofuels Action Plan
  - Interagency board co-chaired by DOE and USDA
  - Addresses topics throughout the biofuel supply chain, including feedstock's and conversion processes, infrastructure, and communication and outreach
- U.S. Congress is working on a number of potential laws that would address alternative and renewable fuel volumes, types, infrastructure, and other issues

Biofuels - EPA's role

- Have authority to regulate biofuels in the following areas
  - Fuel quality and registration
  - Vehicle certification
  - Biorefinery permitting
- Research and development
  - EPA is lead interagency for biodiesel emissions testing program
  - Grant authority
- Manage voluntary programs to promote the use of biofuels by commercial fleets and private citizens
  - SmartWay Grow & Go
  - National Clean Diesel Campaign

EPA's RFS program

- The US Energy Policy Act of 2005 (EPAct) mandated specific volumes of renewable fuel be blended into gasoline beginning in 2006.
  - 4.0 billion gallons in 2006 scaling up to 7.5 billion gallons by 2012
- Final program provisions will apply September 1, 2007.
- Program is designed to encourage blending renewable fuels. It establishes:
  - annual renewable fuel goals
  - compliance values of various renewable fuels
  - responsibilities of refiners and other fuel producers
  - a trading system and other compliance mechanisms
  - recordkeeping and reporting requirements
- EPA published a Regulatory Impact Analysis (RIA), a document that contains analyses of the economic and environmental impacts of the expanded use of renewable fuels under this program.

Impact of RFS program

- **Petroleum consumption in the transportation sector will be reduced 0.8 - 1.6%**
  - Equivalent to 2.0 - 3.9 billion gal petroleum in 2012
  - Reductions in imported petroleum are expected to contribute to ~95% of the reduction in consumption

- **Transportation sector greenhouse gases (CO2 equivalent) will be reduced by 0.4 - 0.6%**
  - Equivalent to 8.0 – 13.1 million metric tons in 2012

2004 Base Reference Year

Incremental Impacts From Base Reference Year to 2012 Cases

Impact of RFS program on air quality

	Nationwide
CO	0.9 - 2.5% decrease
Benzene	1.8 - 4.0% decrease
NOx + VOC	4 - 7% increase
Ozone	~ 0.05 ppb (~ 0.06 percent of the standard)

- Impacts will vary by region since renewable fuel use varies significantly

2004 Base Reference Year

Incremental Impacts From Base Reference Year to 2012 Cases

New Fuels Rulemaking

- **On May 14, 2007, Pres. Bush issued Executive Order 13,432**
  - "Cooperation Among Agencies in Protecting the Environment with Respect to Greenhouse Gas Emissions From Motor Vehicles, Nonroad Vehicles, and Nonroad Engines"
    - EPA, Dept. of Trans., DoE, identified, with consultation with US Dept. of Agriculture
    - Undertaking regulatory action using existing authority
- **Propose rule by the end of 2007, with a final rule completed by October, 2008**

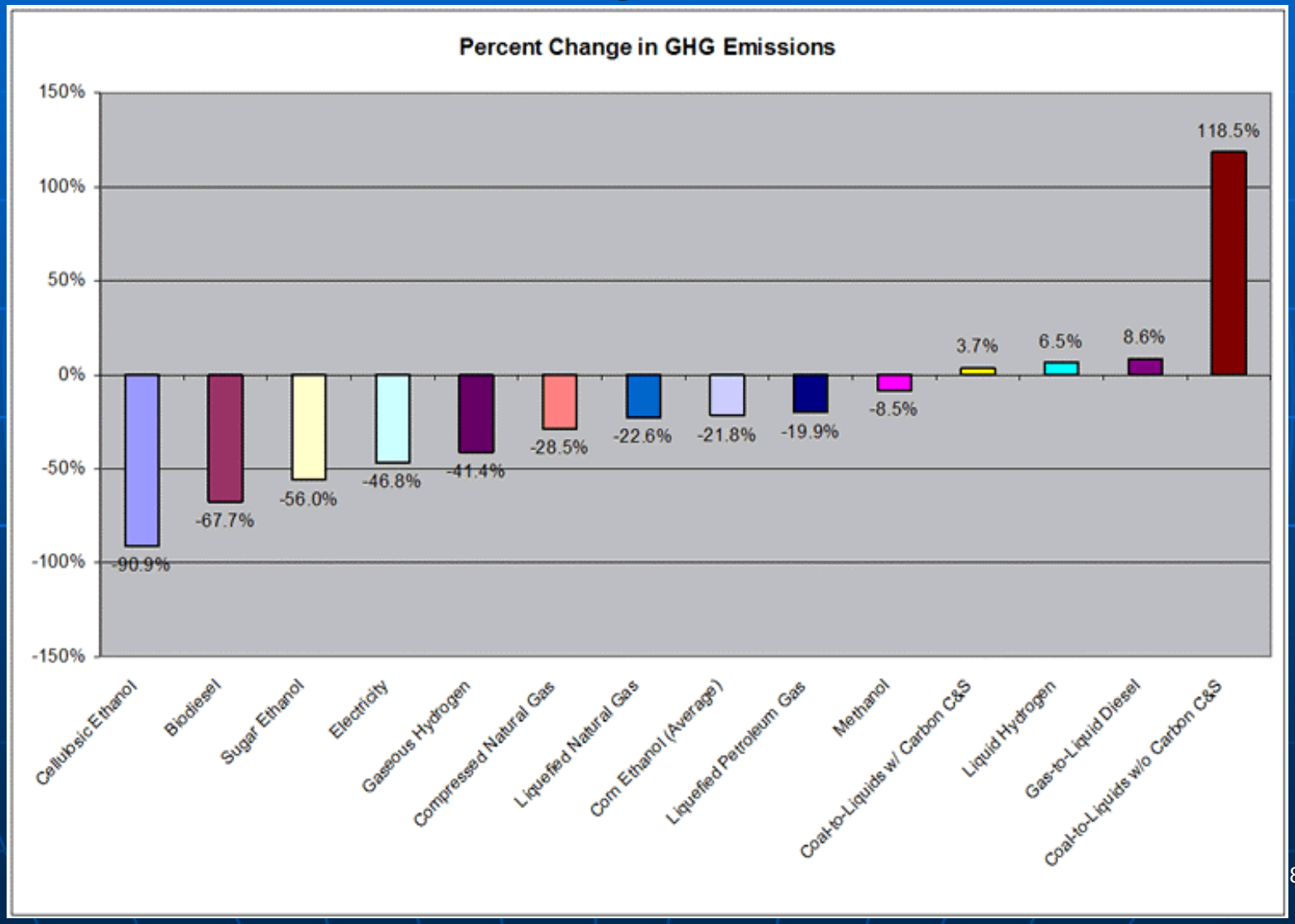
Structure of EPA Program

- **Design a program for reducing GHG's under the Clean Air Act to address President's "Twenty in Ten" announcement**
  - 35 billion gallons of renewable or alternative fuel by 2017
    - Includes ethanol, biodiesel, natural gas
  - Improve efficiency of cars & light-trucks by 4 percent per year
- **Use existing Clean Air Act authorities**

Key Analyses

- Fuels
  - Basis / form of standard
  - Trading & implementation mechanisms
  - Lifecycle GHG and energy analysis
  - Emissions inventories for criteria pollutants & GHGs
  - Air quality analysis
  - Benefits analysis
  - Economic impacts
  - Feasibility & costs
    - Renewable and alternative fuel supply; imports
    - Leadtime
    - Costs (capital, fuel costs, corn ethanol, cellulosic, etc.)
    - Refining modeling
    - Distribution system impacts (incl. E85 infrastructure)
  - Energy impacts, energy security
  - Agricultural impacts
  - Impacts on water quality, soil, pesticides, etc

Renewable and Alternative Fuels Analysis



Conclusion

- Biofuels play an increasing role in U.S. energy portfolio, and will help us achieve our goals of energy security and greenhouse gas reductions.
- Biofuels standards should not inhibit market growth, but need to safeguard environmental quality.
- We need to consider the complete system of engine, fuel, and emissions control when setting performance standards for biofuels.

For more information on EPA programs:

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EPA Office of Transportation & Air Quality

www.epa.gov/otaq

EPA RFS program:

www.epa.gov/otaq/renewablefuels