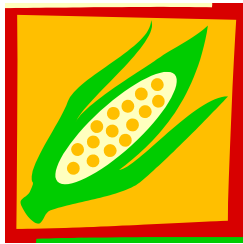


EPA's Role in the World of Renewable Fuels



Agricultural Air Quality Task Force
December 2006

Paul Argyropoulos, Senior Policy Advisor
EPA's Office of Transportation and Air Quality



Presentation Overview

- Overview of Agency Renewable Fuel:
 - Responsibilities
 - Initiatives
- The National Renewable Fuels Standard
- The “Smart Way” Program
- Clean Diesel Program Update

EPA and Biofuels

- Regulatory
 - The Clean Air Act gives EPA authority in a number of areas:
 - Biorefinery permitting
 - Fuel quality and registration
 - Vehicle certification
 - Under the Energy Policy Act EPA has authority to:
 - Implement the Renewable Fuel Standard (RFS)
 - Perform studies on the emissions impact of renewable fuels
- Voluntary Programs
 - EPA has a number of voluntary programs consistent with our mission to improve the environment
- Research & Development
 - Grants for research and demonstrations on conversion of agricultural, food processing, restaurant, and municipal wastes
 - Research on technological issues (e.g., ethanol/water separation)
 - Environmental Technology Verification

OTAQ and Biofuels

- **Renewable Fuel Standard (RFS)**
 - Designing a credit trading program
 - Life cycle assessment of renewable fuels
 - Environmental and economic impacts of increased biofuel production
- **Fuels and Engines**
 - Ensuring that E85, biodiesel and ethanol remain high quality fuels
 - EPA has extensive capabilities for testing vehicles, engines and fuels
- **Alternative Fuel Vehicle Certification**
 - All FFVs are certified for emissions compliance by EPA
 - Conversion kits are also currently being considered for certification
- **Energy Policy Act Fuel Studies**
 - Fuel Harmonization
 - Anti-backsliding
 - Analysis of Permeation Emission Impacts of Ethanol
 - Boutique Fuels
- **State Program Issues**

OTAQ Voluntary Initiatives

- National Clean Diesel Campaign
 - Regional public-private partnerships focused on reducing emissions from the transportation sector
 - West Coast Collaborative, Blue Skyways Collaborative, Southeast Diesel Collaborative, etc.
- SmartWay Grow and Go Partnership
 - Promotes the environmental benefits of renewable fuels
 - Creates a renewable fuel component for EPA's existing SmartWay Transport Partnership

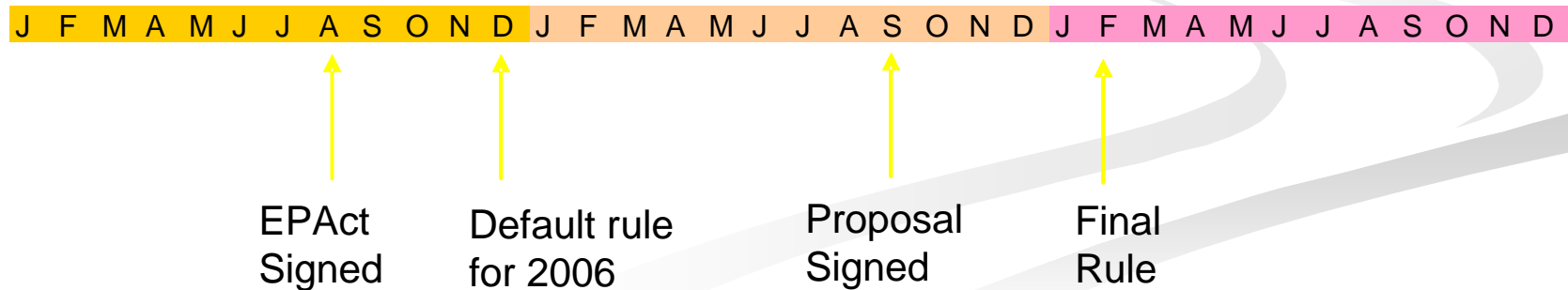
The RFS – The Program Basics

- EPA must promulgate regulations that ensure the use of renewable fuels
 - 2006: 4.0 billion gallons/yr
 - 2007: 4.7
 - 2008: 5.4
 - 2009: 6.1
 - 2010: 6.8
 - 2011: 7.4
 - 2012: 7.5
 - 2013+: Same percent of renewables for 2012 (0.25 billion gal of which must be cellulosic ethanol)
- EPA must convert RFS into percent of gasoline production
 - Based on annual EIA predictions of gasoline consumption given to EPA each Oct 31
 - Applies to refiners, importers, gasoline blenders



RFS Development Timeline

- The Renewable Fuel Standard (RFS) program was required by the Energy Policy Act of 2005 (EPAAct), and started on January 1, 2006
- To cover 2006 we promulgated a rule that implemented default provisions in the Act
- Need to promulgate the full program to cover 2007+
- With substantial collaboration with our stakeholders and commitment from multiple government agencies, we have been able to accelerate the rulemaking schedule



Calculating The Standard

$$\text{Standard} = \frac{\text{Required volume of renewable fuel}}{\text{48-State gasoline volume (Less small refiners)}}$$

- Applies only in the 48 contiguous states unless Alaska or Hawaii opt-in
- ~45 small refineries (<75K bpd) are exempted until 2011) representing ~13% of gasoline volume
- Standard is published each November for the following calendar year
- For 2007, the standard would only apply to gasoline produced after the effective date of the final rule
 - Proposed standard for 2007 is 3.71%
 - Will rise to approx. 4.85% for 2012
- For 2013+ we must conduct another rulemaking to set the RFS program standard based on a review of impact of renewable use from 2006-12 on
 - Environment, air quality, energy security, job creation, rural economic development, expected cellulosic ethanol production
 - Must be no smaller than 2012 standard

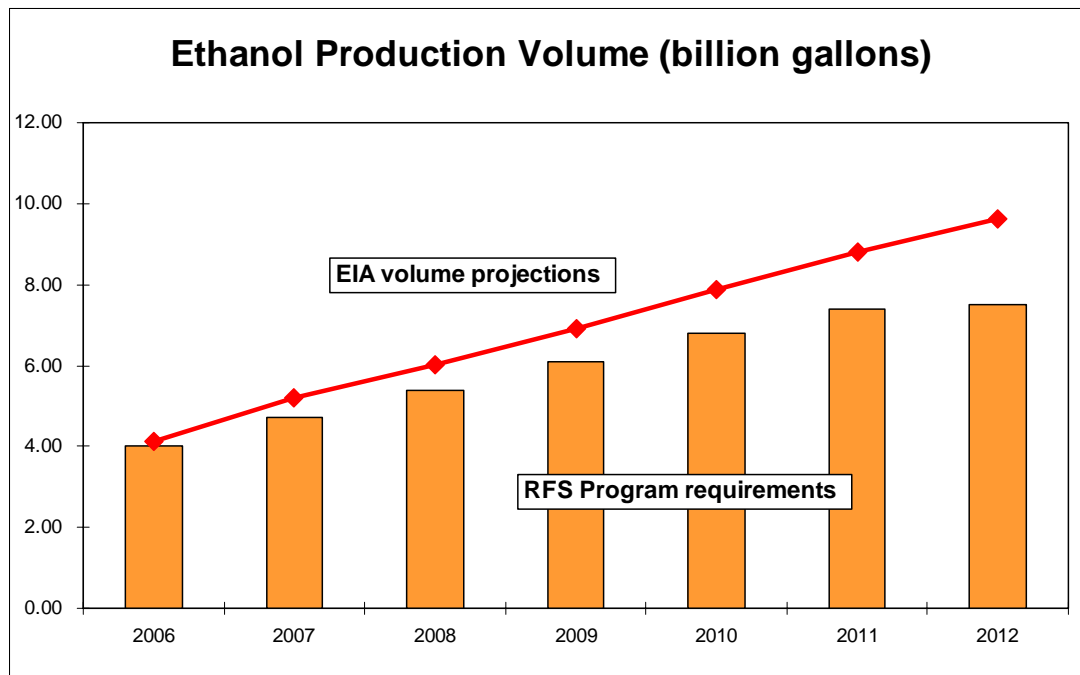
Relative Value of Different Renewables

- EPAAct specifies that 1 gal of cellulosic ethanol counts as 2.5 gallons for compliance purposes
- We proposed a base value for other renewables on volumetric energy content in comparison to ethanol (adjusted for renewable content)
 - Corn-ethanol: 1.0
 - Cellulosic biomass ethanol: 2.5
 - Biodiesel (alkyl esters): 1.5
 - Renewable diesel: 1.7
 - Biobutanol: 1.3
- Sought comment on life cycle energy, petroleum, GHG emissions



Projected Renewable Use

- RFS program standard provides an important foundation for ongoing renewable investments
- But demand for renewable fuels are already projected to outpace the RFS program requirements



- As a result we analyzed the impacts of increases in renewable fuels, not impacts of the program per se
- We analyzed the range from required to projected

* Plus ~300M gallons of biodiesel

Emissions & Air Quality

	Nationwide	Localized maximum
CO	1.3 - 3.6 % decrease	N/A
Benzene	1.7 - 6.2 % decrease	N/A
NO _x + VOC	0.5 - 1.0 % increase	3 - 6 % increase
Ozone	~ 0.1 ppb increase	0.1 - 0.2 ppb increase

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

2004 Base Reference Year

Incremental Impacts From Base Reference Year to 2012 Cases

Energy and CO₂



- Petroleum consumption in the transportation sector will be reduced 1.0 - 1.6 %
 - Equivalent to 2.3 - 3.9 billion gal petroleum in 2012
 - ~95% of the reduction is estimated to be from imports
- Transportation sector greenhouse gases (CO₂ equivalent) will be reduced by 0.4 - 0.6 %
 - Equivalent to 9 - 14 million tons in 2012

2004 Base Reference Year

Incremental Impacts From Base Reference Year to 2012 Cases

Costs of Renewable Fuels



Production & Distribution Costs

Ethanol	\$1.30 - 1.36 per gal
Biodiesel	\$2.00 - 2.22 per gal

- Increases in the use of renewable fuels are expected to add 0.3 - 1 cent per gallon to the cost of gasoline for the nation as a whole (at \$47/bbl crude)
- For the Final Rulemaking we will assess impacts on market prices of corn and soybeans that might impact the Ag sector economy and the impacts on energy security from reduced imports

2004 Base Reference Year

Incremental Impacts From Base Reference Year to 2012 Cases

Basic Proposed Program Requirements

- Every renewable fuel producer must assign a unique serial number, a Renewable Identification Number (RIN) to each batch of renewable fuel
 - Small producers (<10,000 gal/yr) are exempt unless they want to generate RINs
- Obligated parties acquire RINs in order to show compliance
 - RINs provide the basis for all compliance demonstrations
 - One-year allowance for deficit carry-over
- RINs are also the currency for the credit trading program
 - We are proposing that RINs be valid for compliance for the calendar year generated or the following calendar year
 - In order to prevent the infinite rollover of RINs over multiple years, we are also implementing a 20% cap on the number of RINs that can be used for compliance from previous years

RIN Format

- Proposed structure for a RIN is a 34-character numeric code in the format:

YYYYCCCCFFFFFFBBBBBRRDKSSSSSSSEEEEEEE

YYYY	= Year of Batch Production (when it leaves the facility)
CCCC	= Company registration ID
FFFFF	= Facility registration ID
BBBBB	= Producer assigned Batch Number
RR	= Equivalence Value for the renewable fuel
D	= Renewable Type Flag (1-cellulosic; 2-non-cellulosic)
K	= RIN Type Flag (1-standard, 2-extra-value)
SSSSSS	= RIN Block Starting Gallon Number
EEEEEE	= RIN Block Ending Gallon Number



How Do RINs Get From Producers To Obligated Parties?

- The transfer of RINs from one party to another follows the transfer of ownership of batches of renewable fuel from one party to another through the distribution system
- At the point when an obligated party or oxygenate blender procures the renewable fuel along with a RIN, the RIN can then be "separated" from the batch
 - The RIN can either be used for compliance or traded separately from the renewable fuel itself
 - We are not proposing any restrictions on who can buy, sell, trade RINs or how many times
- Compliance is assured by comparing records and reports of RINs generated by renewable producers and RINs used for compliance by gasoline producers
 - Need to be able to identify double counting AND where any such double counting occurred

Valid Life of RINs

- EPA Act says that credits are valid for 12 months following generation
- Since RINs serve the purpose of credits, we are proposed that RINs be valid for compliance for the calendar year generated or the following calendar year
- In order to prevent the infinite rollover of RINs over multiple years, we are also implementing a 20% cap on the number of RINs that can be used for compliance from previous years

Registration, RINs and Recordkeeping

- Parties that take ownership of RINs (with or without the renewable product) must register with EPA
- Renewable producers, obligated parties, and anyone in between in the product distribution system that take ownership of RINs must maintain records of all transactions
- Parties must submit annual reports including the following information:
 - RINs produced, used, purchased, sold
 - All-Electronic Submissions are through EPA's Central Data Exchange (CDX)
- Requirements allow EPA to:
 - Match RINs produced vs. RINs used
 - Quickly identify the source of problems if they don't match

Next Steps

- Review of Comments
- Finalize Package making modifications based on supportable comments
- Completion of Final RFS Rule is expected for early 2007
- Program Implementation in 2007
 - Record Keeping
 - Reporting
 - Compliance Monitoring



Expanding Renewable Fuel Through Voluntary Partnerships and Outreach



EPA's Voluntary Partnerships

National Clean Diesel Campaign

- Regional public-private partnerships focused on reducing emissions from the transportation sector
- West Coast Collaborative, Blue Skyways Collaborative, Southeast Diesel Collaborative, etc
- These collaboratives are working to bring about greater access to biodiesel and E85 along key transportation corridors

SmartWay Transport Partnership

- A voluntary partnership between various freight industry sectors and EPA that establishes incentives for fuel efficiency improvements and greenhouse gas emissions reductions
- Nearly 500 fleet partners
- Biodiesel and E85 are verified strategies for fleets' SmartWay commitments—new program expands on this...

SmartWay Grow & Go

- New EPA initiative to promote the environmental benefits of renewable fuels
- Builds on a number of existing EPA activities
 - Renewable Fuel Standard, Regional Collaboratives, SmartWay Transport
- Creates a specific renewable fuel component to EPA's existing SmartWay Transport Partnership
 - By 2012—goal is to have 25 percent of our SmartWay partners commit to use renewable fuels
 - By 2020--50 percent of our partners commit to use renewable fuels.



Public Information & Outreach

- Recently updated fact sheets on biodiesel and E85
- Expanded web presence through SmartWay Grow & Go website
- Growing our well-known SmartWay Transport brand to include renewable fuels
- Helping our SmartWay partners understand the business advantages of investing in renewable fuels
- Strengthening the technical and regulatory framework surrounding renewable fuels



Biomass Technology Workshop

- In accordance with Sections 1511 and 1514 of the Energy Policy Act EPA is holding a scoping workshop on cellulosic biomass technologies that are close to commercialization status
 - December 11 at JW Marriott Hotel



- Update -
Ultra-low Sulfur Diesel Highway
Fuel Implementation

The background of the slide features a light gray gradient. In the lower right quadrant, there are several thick, wavy, light gray lines that resemble stylized smoke or steam rising from the bottom right towards the center.

EPA Implementation Efforts

- **Clean Highway Diesel Rule finalized in 2001**
- **Implementation has been a very high priority for EPA**
 - 5 ½ years working with all stakeholders
 - regulation developed with input from all major stakeholders
 - Included substantial lead-time, flexibilities, and a transition period
- **In past year, EPA has provided additional transition time and flexibilities in response to industries needs**
- **Clean Highway Diesel Program of national importance**
 - Importance for public health
 - Substantial level of effort required by industry
- **EPA has issued multiple Implementation Progress Reports and co-sponsored multiple implementation workshops**
- **EPA has issued guidance documents, Q&A documents, and technical amendment regulations in response to industries' needs**

Clean Air Highway Diesel Program Requirements

- **ULSD is the foundation of the Clean Air Highway Diesel Program**
 - Program developed as a systems approach: Clean Fuel & Clean Engines
 - New model year 2007 engines and vehicles require ULSD

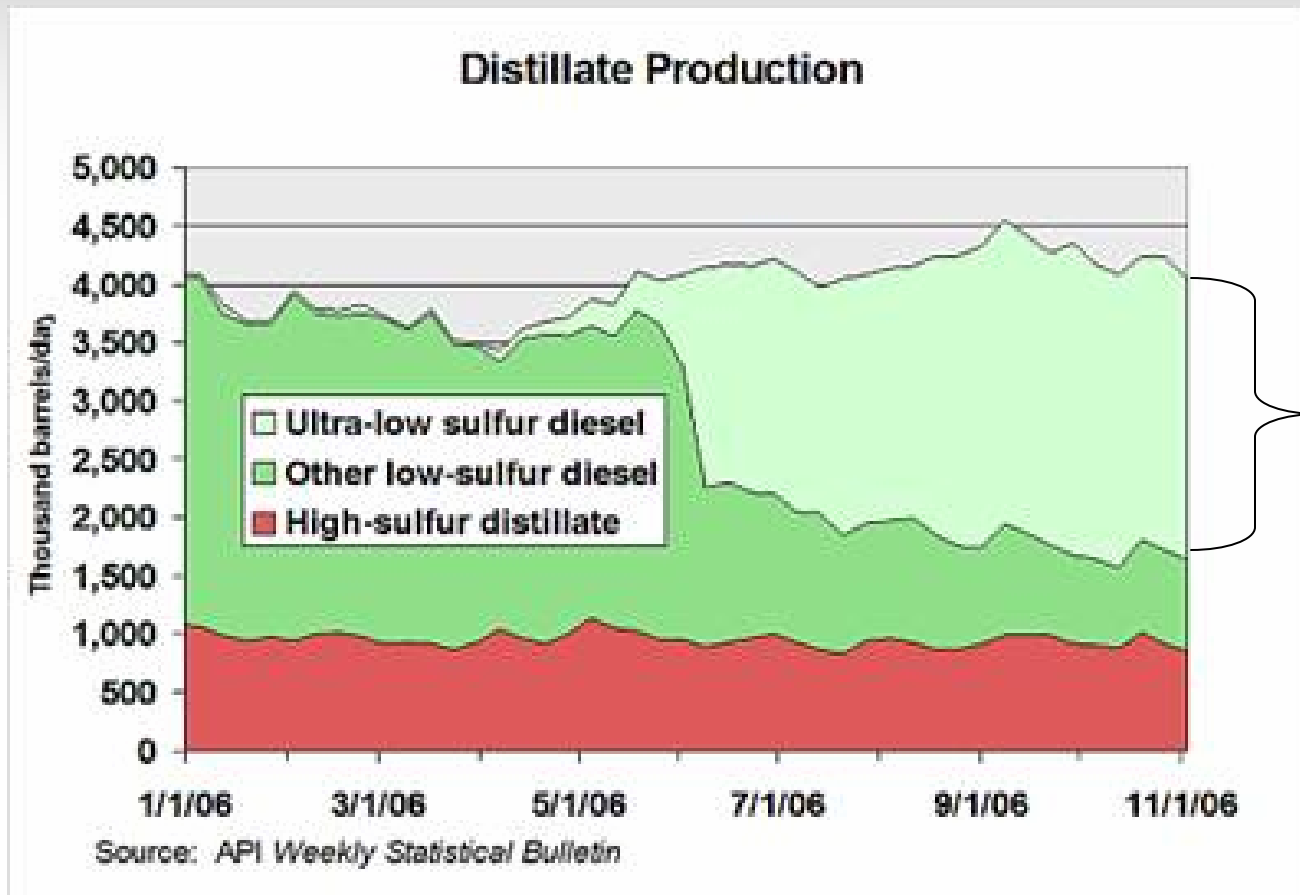
- **Clean Diesel Fuel**
 - Sulfur in diesel prevents the use of advanced emissions control systems
 - Since 1993, highway diesel fuel sulfur has been capped at 500 parts per million (ppm)
 - Beginning June 1, 2006: 80 percent of the highway diesel fuel volume produced or imported must be 15 ppm sulfur or less (“ultra-low sulfur diesel”, ULSD)
 - June 1, 2010: 100 percent of highway diesel fuel produced or imported must be ULSD

- **Clean Diesel Engines and Vehicles**
 - Heavy-duty diesel trucks and buses must meet stringent new standards beginning with model year 2007
 - 90 percent reduction in diesel particulate matter
 - 95 percent reduction in oxides of nitrogen, phased in through 2010
 - New diesel light-duty passenger vehicles, sport-utility vehicles and pickup trucks must also meet stringent Tier 2 standards which require ULSD

Status of Ultra-low Sulfur Diesel Fuel Implementation

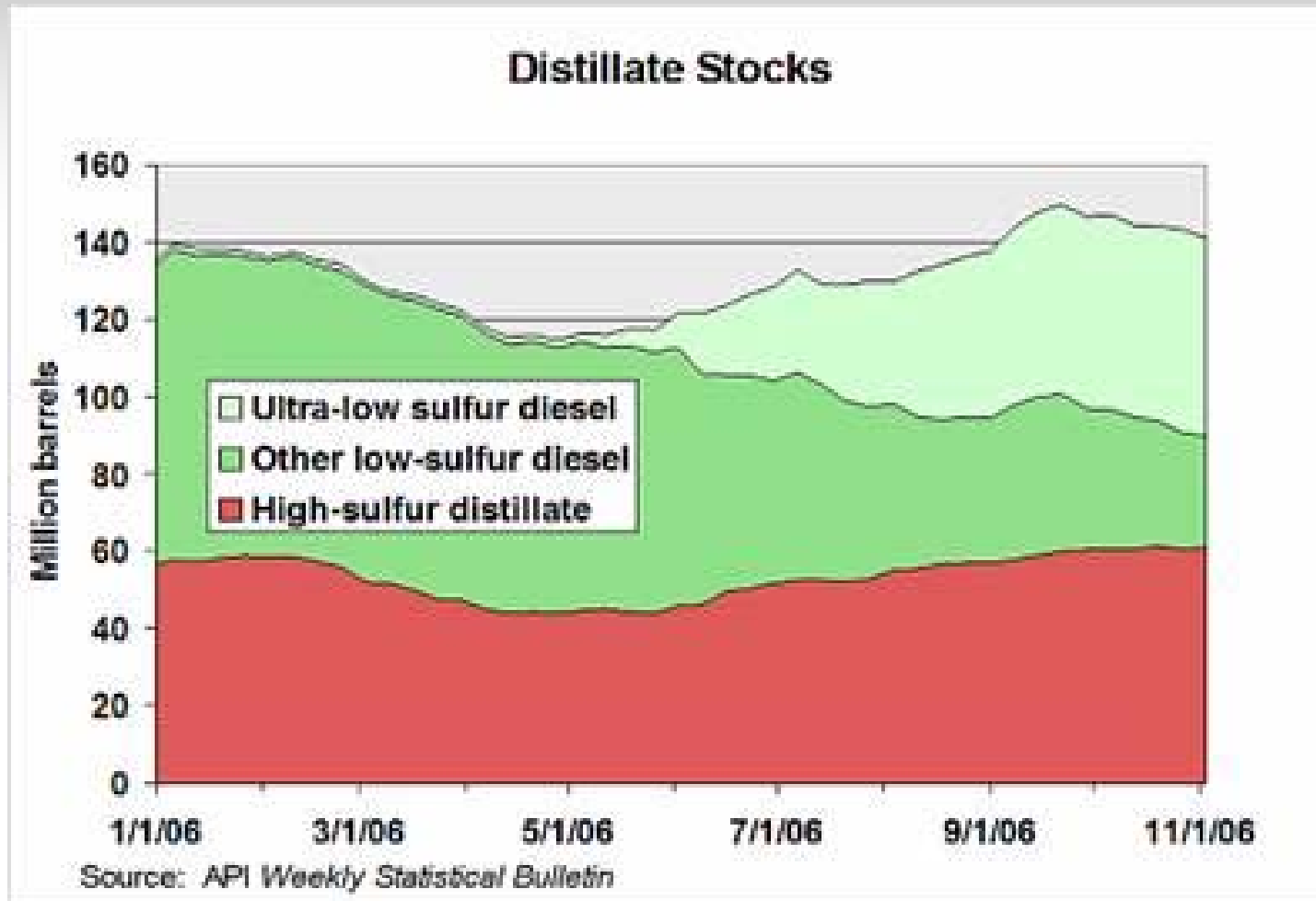
- ULSD program start-up transition occurred over 4½ months (June 1, 2006 – October 15, 2006)
 - ✓ June 1: Refineries and importers must produce ULSD
 - ✓ September 1: ULSD distributed by Pipelines and Terminals must meet 15ppm
 - ✓ October 15: ULSD distributed by Retail Stations must meet 15ppm
- Transition period provided time for each party in the distribution chain to implement the new practices necessary to protect ULSD from contamination
- ULSD transition
 - Approximately 2 million barrels per day (bpd) produced since June
 - Recent Production in the range of 2.4 to 2.6 million bpd
 - Equivalent to ~90% or more of the estimated average daily consumption of highway diesel fuel versus 80% requirement

Diesel fuel production for 2006



ULSD production ranges between 2.4 to 2.6 million bpd

Diesel fuel inventories at terminals for 2006



Clean Diesel Fuel Alliance

- EPA is a member of the industry-gov't outreach effort called the "Clean Diesel Fuel Alliance" (CDFA)
- Primary Purpose of the Stakeholder Outreach Effort
 - Develop and distribute common messages to educate the public
 - Answer common questions from the user community including
 - CDFA established a contractor operated 800 number for consumers and others to call with questions
 - Questions are forwarded to the appropriate CDFA member for follow-up
- Facilitated information sharing between the members regarding potential issues and status of ULSD implementation
 - Weekly e-mail updates on ULSD roll-out status
 - Monthly conference calls

Clean Diesel Fuel Alliance Members

Association of International Automobile Manufacturers
Alliance of Automobile Manufacturers
Engine Manufacturers Association
Diesel Technology Forum
Manufacturers of Emission Controls Association

US Environmental Protection Agency
US Department of Energy
US Energy Information Administration

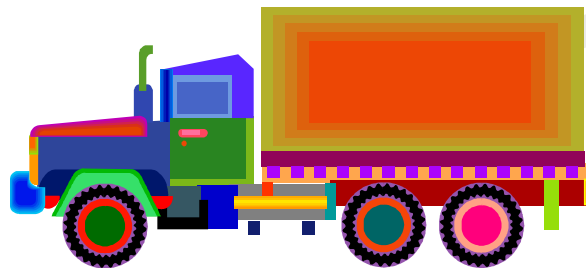
American Petroleum Institute
National Petrochemicals and Refiners Association
Association of Oil Pipelines
Independent Liquid Terminals Association
Western States Petroleum Association

National Assoc. of Truck Stop Operators
Petroleum Marketers Association of America
Society of Independent Gasoline Marketers of
America

American Trucking Associations
National Tank Truck Carriers
National Automobile Dealers Association
Truck Renting and Leasing Association
American Automobile Association



EPA's Clean Air Nonroad Diesel Rule



Nonroad Diesels

Last Major Mobile Source Sector

- **Construction**

- excavators, bulldozers, ...



- **Industrial**

- portable generators, forklifts, ...



- **Agricultural**

- tractors, combines, irrigation pumps, etc.



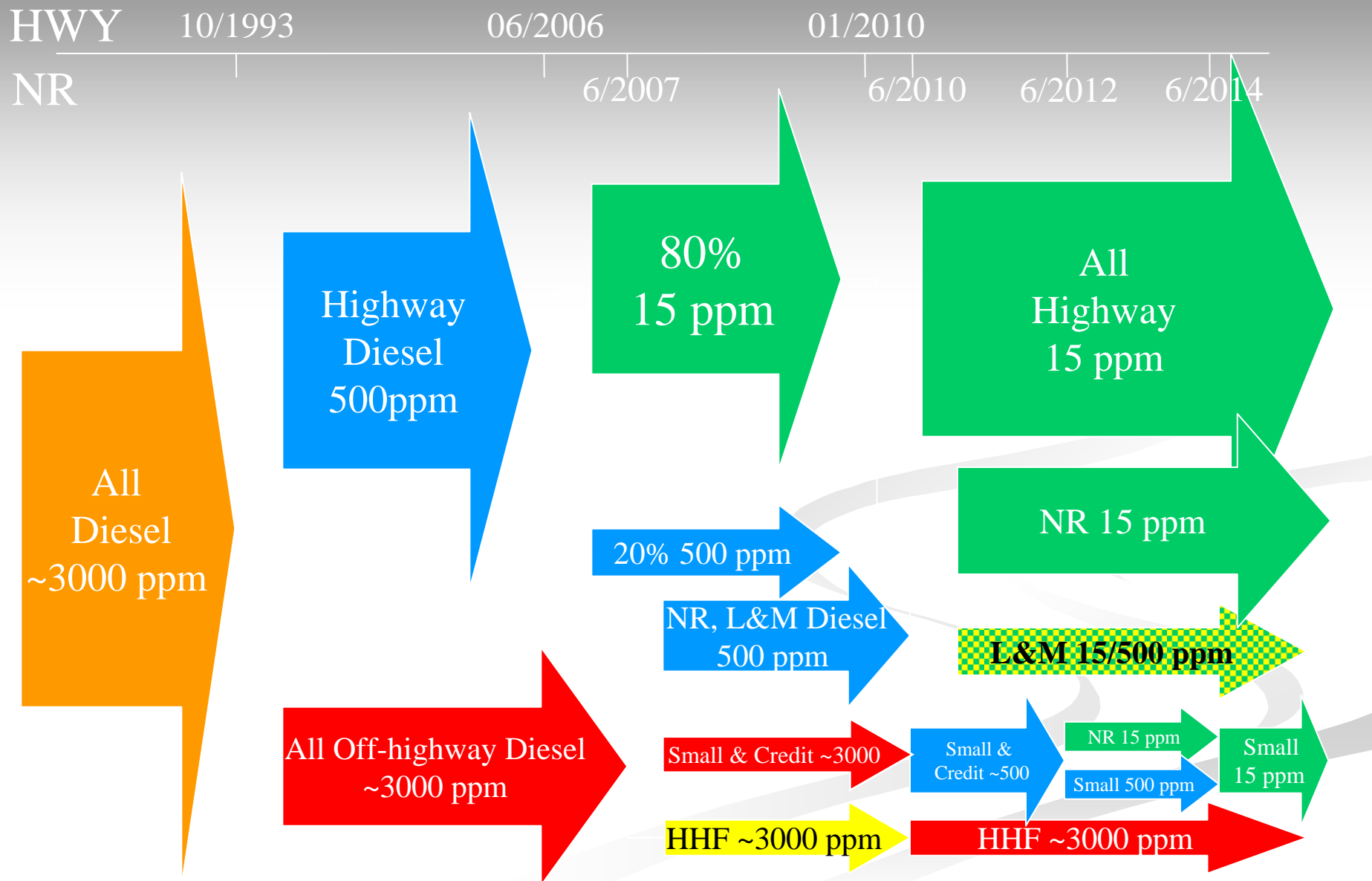
Nonroad Sources

- **Serious health and welfare impacts from nonroad diesel fuel and equipment--**
 - **Fine particles, ozone, toxics**
- **Sources contribute ~43% of total mobile source diesel PM and 12% of total mobile source NOx nationwide**
- **Rule follows a systems approach similar to the 2007 highway diesel rule:**
- **Fuel sulfur reduced to 15 ppm**
 - **Enables engine aftertreatment technologies like particulate traps, NOx adsorbers**
 - **Achieves large immediate sulfate PM reductions in existing fleet**
- **Diesel engine aftertreatment**
 - **to achieve ~90% reductions in NOx and PM**

MVNRLM Diesel Fuel Standards

Who	Covered Fuel	2006	2007	2008	2009	2010	2011	2012	2013	2014
	Highway Diesel Fuel	80% 15 ppm / 20% 500 ppm				100% 15 ppm (including small refiner fuel)				
Large Refiner & Importer	Nonroad		500	500	500	15	15	15	15	15
Large Refiner & Importer	Loco and Marine		500	500	500	500	500	15	15	15
	NRLM with Credits (Not in NE or AK)		HS	HS	HS	500	500	500	500	15
Small Refiner	NRLM (Not in NE, w/ approval in AK)		HS	HS	HS	500	500	500	500	15
Transmix Processor & In-use	Nonroad (Not in NE or AK)		HS	HS	HS	500	500	500	500	15
Transmix Processor & In-use	Loco and Marine (Not in NE or AK)		HS	HS	HS	500	500	500	500	500

Highway + Nonroad Diesel Fuel Sulfur Control*



Provisions to Reduce Economic Impacts through Implementation Flexibility

- Sufficient lead time given to develop and produce advanced emission-control systems. (i.e. ranges from 4 to 11 years)
- Engine manufacturers that are small businesses are given an additional 1 to 3 years to meet standards.
- Small refiners are given 3-4 years of additional lead time.
- Early credits provided to encourage companies to meet requirements early.
- Averaging, Banking, and Trading provisions are maintained in program.
- Additional time is given to equipment manufacturers for small volume products.
- Companies may petition EPA for relief if the burden of the regulations would cause severe economic or technical hardship.



Q&As and other guidance documents:

www.epa.gov/cleandiesel/comphelp.htm

Web pages:

Highway Diesel- www.epa.gov/otaq/diesel.htm

Nonroad Diesel- www.epa.gov/nonroad-diesel/2004fr.htm

eCFR- http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=94cf84cc9b9f6927a1ff4daf8d7f8642&tpl=/ecfrbrowse/Title40/40cfr80_main_02.tpl

- **Clean Diesel Fuel Alliance**

- www.clean-diesel.org