

# **The Auto Industry and Environmental Protection: The Road Ahead**

**SAE 2010 Government/Industry Meeting**

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## New Administration Priorities and Emphasis

- Comprehensive approach to climate, energy, transportation and the economy
- Recognize the vital role auto companies play
- EPA, DOT, and DOE cooperation to support and advance the U.S. auto industry



# EPA Climate Regulatory Actions

- **Endangerment Finding**
  - GHG emissions endanger public health and welfare
  - Provides the legal basis for the Light-Duty Vehicle Rule
  - Issued December 7, 2009
- **Greenhouse Gas Monitoring and Reporting Rule**
  - Applies to direct emitters of GHGs generally equal or greater to 25,000 metric tons/year
  - Covers an estimated 85 percent of total U.S. GHG emissions
  - Issued September 22, 2009
  - Facilities begin collecting data January 2010
- **PSD Tailoring Rule**
  - Would require the largest industrial facilities to adopt the most efficient technologies available when they are constructed or upgraded
  - Proposed September 30, 2009

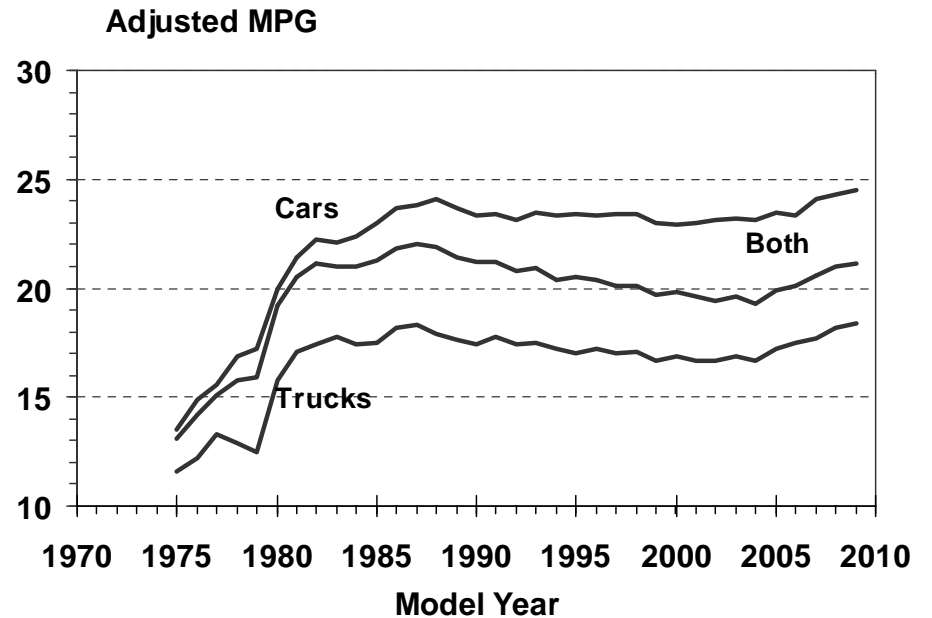
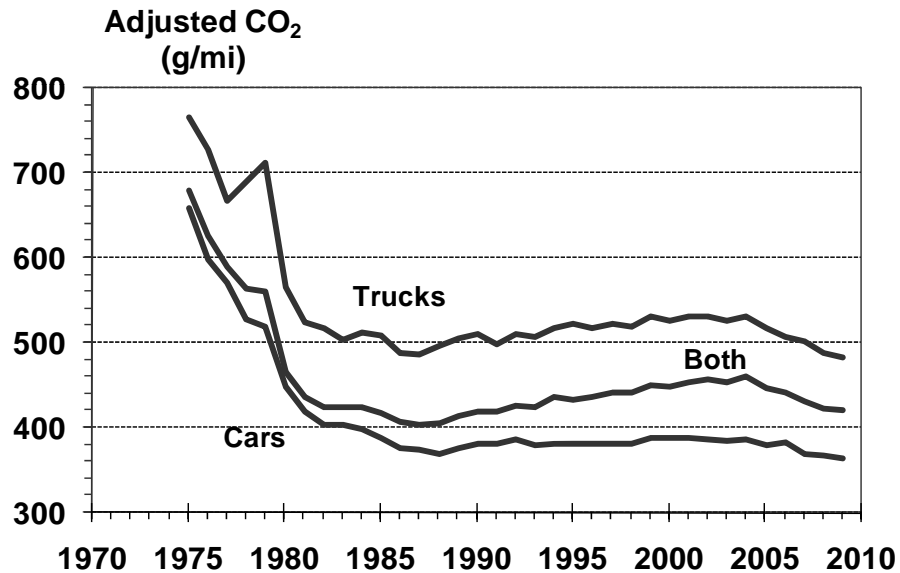
## GHG Mobile Source Petitions Under EPA Consideration

- **Marine Shipping vessels** – 3 petitions for rulemaking to set GHG standards under section 213(a)(4) for vessels and 211 for fuels
- **Aircraft** – 2 petitions for rulemaking to set GHG standards for aircraft under section 231
- **New nonroad vehicles and engines** – 3 petitions for EPA to set standards under section 213 for nonroad engines other than aircraft, locomotives and vessels.

## Fuel Economy Trends

- **Many manufacturers are increasing fleetwide fuel economy, resulting in lower CO2 emissions.**
- **Technological innovations since 2005 have resulted in . . .**
  - lower CO2 emissions,
  - higher MPG and
  - greater performance.
- **Last 5 years we've seen modest CO2 decreases and fuel economy increases compared with 1987-2004.**
- **Trucks continue to represent about half of new vehicle sales.**

# Adjusted CO<sub>2</sub> and Fuel Economy, MY1975-2009



## Light Duty Vehicle GHG Rule

- Close cooperation with DOT and NHTSA
- Applies to MY 2012-2016 cars, SUVs, minivans, pickups
- Increases fuel economy by approximately five percent every year
- Reduces greenhouse gas emissions by nearly 950 million metric tons
- Conserves 1.8 billion barrels of oil
- Compliance costs for industry of less than \$60 billion
- Total benefits of \$250 billion and net benefits of \$190 billion (using \$20/ton CO<sub>2</sub> valuation and 3% discount rate)
- Status:
  - Proposed September 15, 2009
  - Goal is to complete by March of 2010

## Consumer Impacts – Model Year 2016

- Per vehicle cost less than \$1,100
- Payback period Less than 3 years for buyers who pay cash
  - Fuel savings offset loan payments by \$130 to \$160 each year
- Lifetime savings of more than \$3,000 (using a 3% discount rate)

## Proposed Standards Do Not Require “Next Generation” Technologies

- We estimate the proposed standards can be met with significant penetration of currently available technologies, e.g.
  - Gasoline direct injection fuel systems
  - Engine downsizing with turbocharging
  - 6-speed transmissions or dual-clutch transmissions
  - High efficiency, low-leak air conditioning systems
  - Engine start-stop systems
- Proposed standards can be met with little to no penetration of diesel engines, hybrid electric vehicles (HEV), plug-in hybrid electric vehicles (PHEV), or pure-battery electric vehicles (BEV)

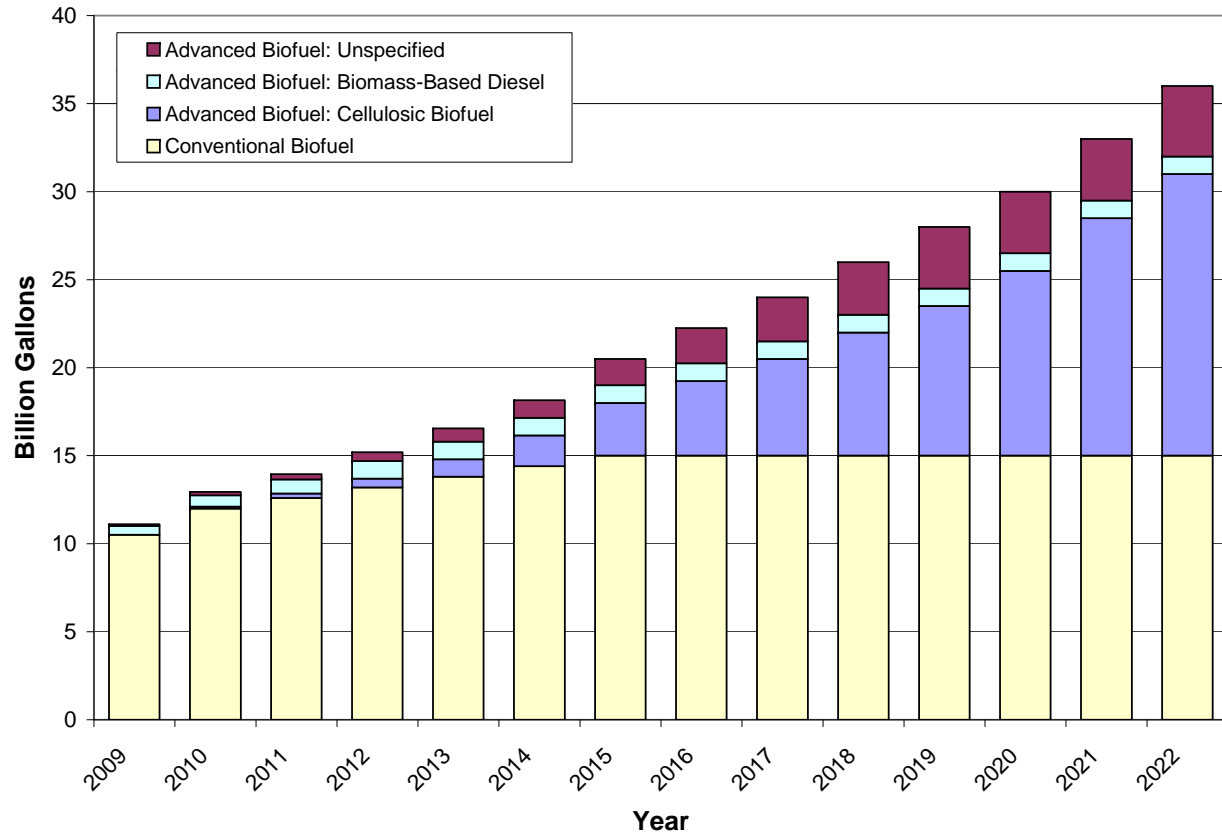
# Standards are Footprint Attribute-based

Each manufacturer's standard based on the footprint of the vehicles produced  
 – actual standards are curves which equate a vehicle size to its specific CO<sub>2</sub> or MPG target

Vehicle Type	Example Models	Example Model Footprint (sq. ft.)	CO <sub>2</sub> Emissions Target (g/mi)	Fuel Economy Target (mpg)
<b>Example Passenger Cars</b>				
Compact car	Honda Fit	40	214	41.4
Midsize car	Ford Fusion	46	237	37.3
Fullsize car	Chrysler 300	53	270	32.8
<b>Example Light-duty Trucks</b>				
Small SUV	4WD Ford Escape	44	269	32.8
Midsize crossover	Nissan Murano	49	289	30.6
Minivan	Toyota Sienna	55	313	28.2
Large pickup truck	Chevy Silverado	67	358	24.7

# Renewable Fuels – Overview

- Increased required volumes from 7.5 billion gallons per year in 2012 to 36 billion gallons per year in 2022
- New renewable categories with GHG reduction thresholds from 20-60%
- Proposal in May 2009



# Environmental and Health Progress

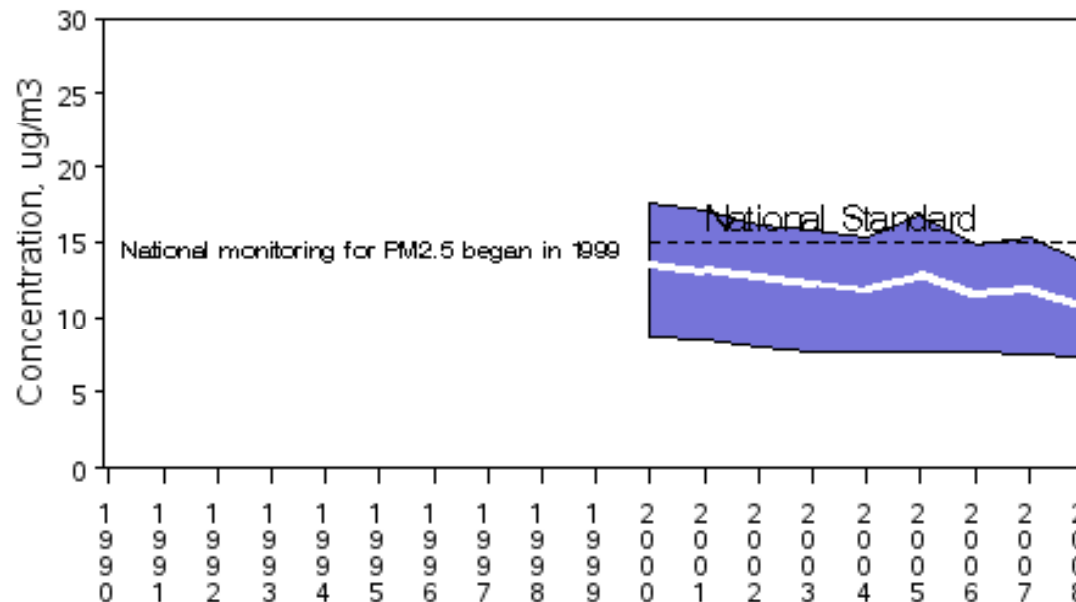
2030	Light-duty Tier 2	Heavy-duty 2007	Nonroad Diesel Tier 4	Locomotive & Marine Diesel	2030 Total
<b>NO<sub>x</sub></b> (short tons)	2,800,000	2,600,000	738,000	795,000	6,933,000
<b>PM<sub>2.5</sub></b> (short tons)	36,000	109,000	129,000	27,000	301,000
<b>VOC</b> (short tons)	401,000	115,000	34,000	43,000	593,000
<b>SO<sub>x</sub></b> (short tons)	281,000	142,000	376,000	0	799,000
<b>Cost</b>	\$5 billion	\$4 billion	\$2 billion	\$740 million	\$11.74 billion
<b>Net Benefits</b>	\$25 billion	\$70 billion	\$80 billion	\$11 billion	\$186 billion
<b>Avoided Premature Mortality</b>	4,300	8,300	12,000	1,400	26,000
<b>Avoided Hospital Admission</b>	3,000	7,100	8,900	870	19,870
<b>Avoided Lost Work Days</b>	700,000	1.5 million	1.0 million	120,000	3,320,000



# PM2.5 Trends

**19% decrease in national average from 2000-2008**

**PM2.5 Air Quality, 2000 - 2008**  
 (Based on Seasonally-Weighted Annual Average)  
 National Trend based on 728 Sites



# Mobile Source Air Toxics Rule

- EPA estimates that in 2030 the Mobile Source Air Toxics Rule would reduce 330,000 tons of mobile source air toxics, including:
  - 1 million tons of VOC emissions
  - 61,000 tons of benzene
  - 19,000 tons of PM<sub>2.5</sub>
- As a result of this rule, new passenger vehicles will emit 45 percent less benzene, gas cans will emit 78 percent less benzene, and gasoline will have 38 percent less benzene overall.
- The annual net social costs of this rule will be approximately \$400 million in 2030 (expressed in 2003 dollars).
- We estimate that the additional cost to manufacturers will be less than \$1 per vehicle.

## Success of the Diesel Retrofit Program

- **Recovery Act Funding** –\$300 M in stimulus funding in February 2009.
  - 160 projects across the country
- **Retrofit accomplishments** –
  - 3 million children are riding in cleaner school buses
  - More than 40,000 buses retrofitted
- **Projected benefits** –
  - Beginning in 2030 roughly 40,000 deaths will be prevented annually

# Looking Forward

- Enormous opportunity for future GHG reductions through large-scale introduction of advanced technologies like HEVs, PHEVs, and BEVs
- A wide variety of safe, environmentally-friendly vehicles
- Also assessing future GHG controls in the heavy-duty sector.
  - The 2007 *Massachusetts vs EPA* Supreme Court decision included heavy-duty GHG emissions, as well as light-duty vehicles.
  - In February, 2009 the Engine Manufacturers Association sent a letter to Administrator Jackson, to express their support for EPA regulation of GHG emissions from medium- and heavy-duty vehicles.