EPA Programs Addressing Motor Vehicle Air Toxics Emissions

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Outline of Presentation

• Mobile source air toxics standards
• Upcoming standards – renewable fuels
• Future work
Mobile Source Air Toxics Rule: Standards

- Published February 26, 2007
- Three major components
  - Gasoline benzene standard
  - Vehicle emissions standards
  - Portable fuel container
- Expect reductions of approx. 330,000 tons of MSATs by 2030
What are MSATs?

• Compounds that are emitted by mobile sources and have the potential for serious adverse health effects
• 2001 rule had formal list of 21 MSATs
• MSAT2 rule eliminated specific list of MSATs
  – Acknowledges several ways to identify potential for serious health effects
    • IRIS, ATSDR, CalEPA, IARC, NTP, etc.
    • Each has strengths and limitations
  – Benzene, 1,3-butadiene, formaldehyde, acrolein, acetaldehyde, diesel PM + exhaust organic gases, naphthalene, POM are among key MSATs of interest
Gasoline Benzene Standard

• Gasoline: 0.62% average benzene content beginning in 2011
  – Nationwide trading
    • No individual refinery’s annual average can exceed 1.3%
  – Areas with highest benzene (Alaska, northwest) will have most significant reductions

• Current benzene average is about 1%
Vehicle Program

• NMHC (non-methane hydrocarbons) standards at lower temperatures (20°)
  – Reduces PM and air toxics as well
  – Air toxics reduced include benzene, formaldehyde, acetaldehyde, others

• Standards
  – Reduce total MSATs from vehicles by approximately 290,000 tons in 2030
    • 0.3 g/mile for vehicles below 6,000 lbs GVW
    • 0.5 g/mile for vehicles above 6,000 lbs GVW

• Also, evaporative standards
  – Equivalent to CARB (50 state standards)
  – Effective 2009-2010
Portable Fuel Container Program

- Limits hydrocarbons from evaporation and permeation
- For gasoline, diesel fuel, and kerosene containers
- Starts for containers manufactured in 2009
- Permeation standard of 0.3 g/day HC
- Cans will have permeation barrier and new automatically-closing spouts
- Standard results in 78% decrease in benzene emissions
Nonroad Emission Standards

- Published October 8, 2008
- Small gasoline engines (under 25 HP), equipment, and vessels
- Small nonroad engines
  - HC + NOx standards for model years 2011-2012
  - Also CO standard
  - Consistent with CARB standards
- Marine (outboard, personal watercraft)
- Annual HC reductions 130,000 tons when rule fully implemented
Locomotive/Marine Diesel

• Published June 30, 2008
• Existing fleet – rebuilt engines
• Tier 3 for newly built engines phasing in for 2009
  – PM and NOx standards
• Tier 4 for newly-built engines
  • Incorporate catalytic aftertreatment
  • 2014 for marine; 2015 for locomotives
  – PM reductions of 27,000 tons in 2030
  – NOx reductions of 800,000 tons in 2030
Upcoming Work
Ocean-going Vessels

- Proposal published Aug. 26, 2009
- Controls diesel emissions from largest marine vessels:
  - container ships
  - Tankers
  - bulk carriers
  - cruise ships
- Anticipated reductions of 143,000 tons of diesel PM by 2030 (1.2 million tons of NOx)
Renewable Fuels

• Energy Policy Act (EPAct) of 2005
  – Renewable Fuel Standards 1 program
  – Finalized May 2007
  – Program started September 2007
  – 7.5 billion gallons/year by 2012

• Energy Independence and Security Act of 2007
  – Greatly increased use of renewable fuels
  – 36 billion gallons by 2022
  – Requirements for specific fuels
    • Conventional biofuel (corn-based ethanol)
    • Cellulosic biofuel
    • Biomass-based diesel
    • Other advanced biofuel

• Renewable Fuels Standard (2) Proposal published May 26, 2009 – Final rule underway
Renewable Fuel Standards 2: Two Key Studies Required

• Section 204 report
  – Environmental and resource conservation
  – Every three years – recurring report

• Section 209 anti-backsliding
  – Requires study on air quality impacts of increased renewable fuel volumes
  – Requires regulations by the end of 2010 to mitigate any potential adverse impacts
Renewable Fuel Standards 2: Emissions Issues Across the Fuel Lifecycle

• Upstream
  – Agriculture
    • Fertilizer/pesticide production, transport and use
    • Farm equipment
  – Fuel Production
    • Gasoline, ethanol, biodiesel…
  – Fuel Transport and distribution

• Downstream (vehicle and engines)
  – Exhaust emissions
  – Evaporative emissions
  – Refueling emissions
Other OTAQ Actions Addressing MSATs

• Emission standards that reduce VOC, PM, and diesel emissions also reduce toxics
  – Low-sulfur gasoline and Tier 2 emission standards
  – Low-sulfur diesel and 2007/2010 HD emission standards
  – 2004 Non-road Diesel Rule
• Voluntary programs in OTAQ
  – National Clean Diesel Campaign
    • Retrofit engines with emission control technology
    • Cleaner fuels
    • Funding and other incentives
    • Idle reduction
• Evaluating public health and welfare endangerment from lead emitted by piston-engine aircraft operating on leaded aviation gasoline
Other Relevant EPA Work

• EPA has continuing obligation to review and revise regulations
• Several applicable areas of work related to mobile sources include:
  – Emission data with new vehicles and fuels
  – Air quality impact of new vehicles and fuels
  – Near roadway impacts
  – Atmospheric chemistry
  – Climate change