



Office of Transportation and Air Quality

Update for Air Directors: Transportation and Air Quality

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Overview

- Recent Results
- Current Priorities
- Federal Regulations—What's in the Pipeline
- Clean Diesel Grant Update



Recent Results

- Light-Duty Vehicle Greenhouse Gas Standards MY2012-2016
- North America Emission Control Area for Ocean Going Vessels
- New Renewable Fuel Standards



Current Priorities

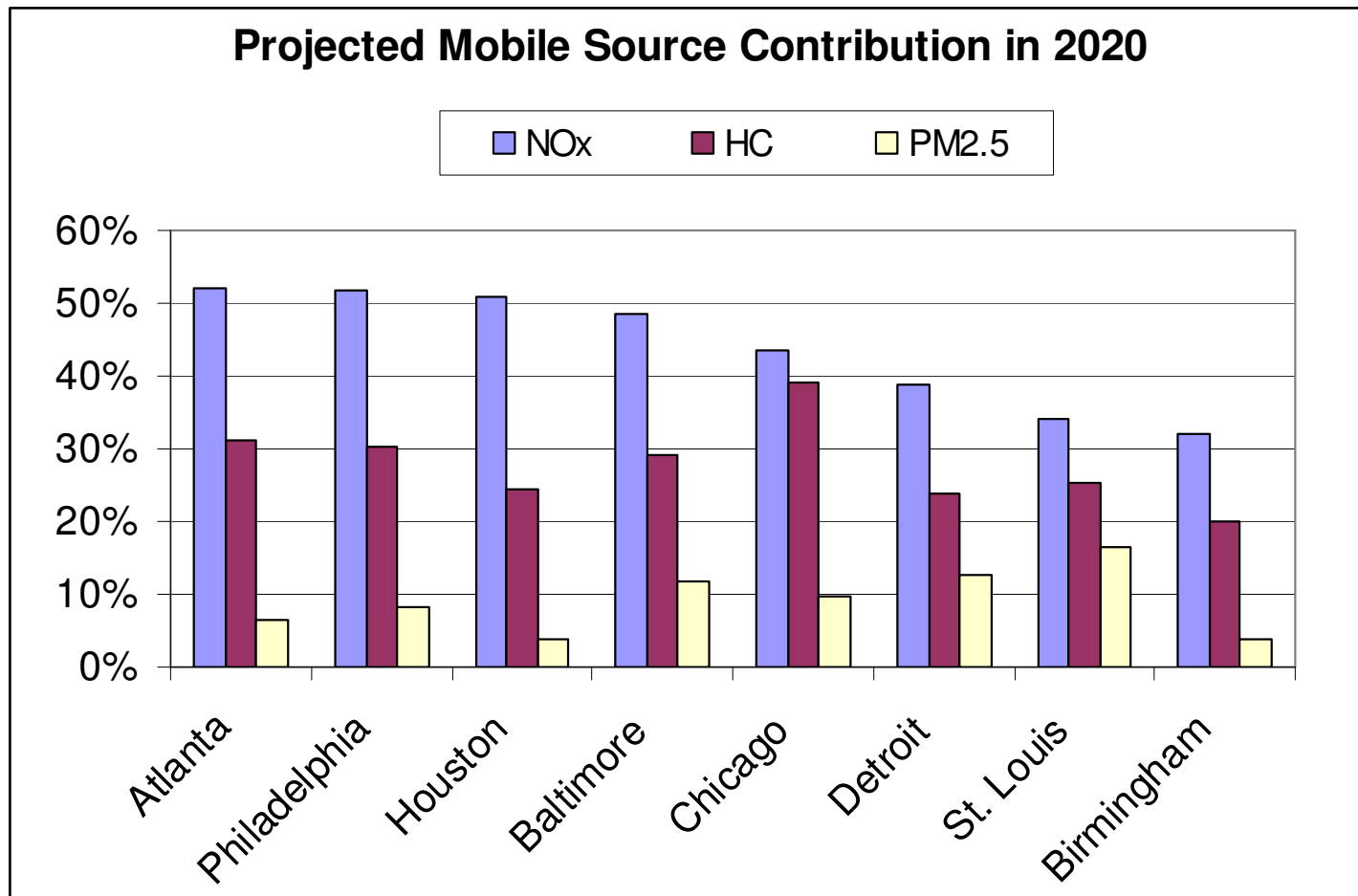
- Heavy Duty Greenhouse Gas Standards
- Next Phase of Light Duty Vehicle Standards
- RFS2 Implementation
- E15 Waiver Consideration
- New Fuel Economy Label Rule
- International Aviation and Marine GHG
- Addressing the Legacy Fleet/Supply Chain
- Implementing Federal Measures



Helping States Achieve the NAAQS for PM, Ozone, NO₂ and CO

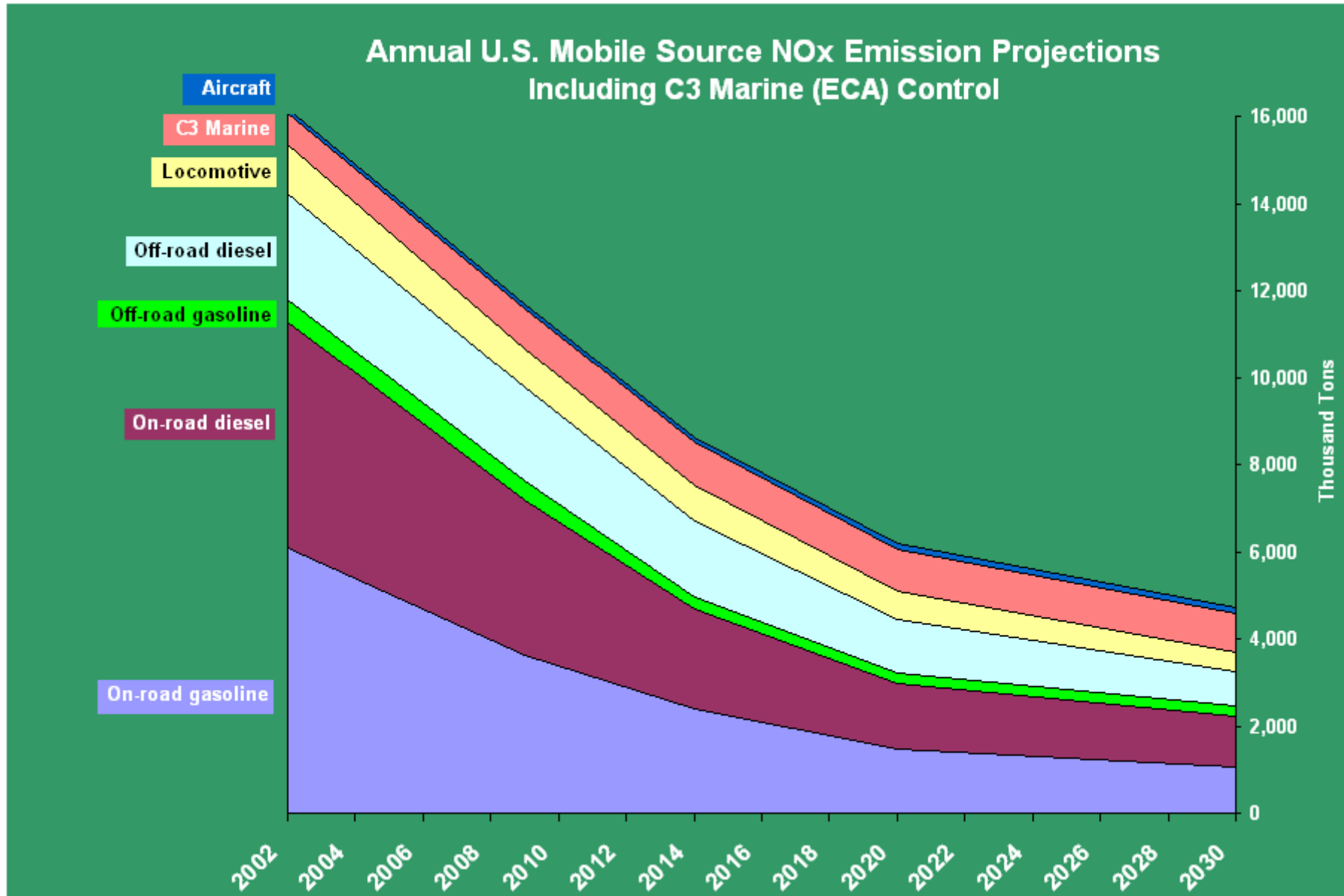


Projected 2020 Mobile Source Contribution for Select Cities





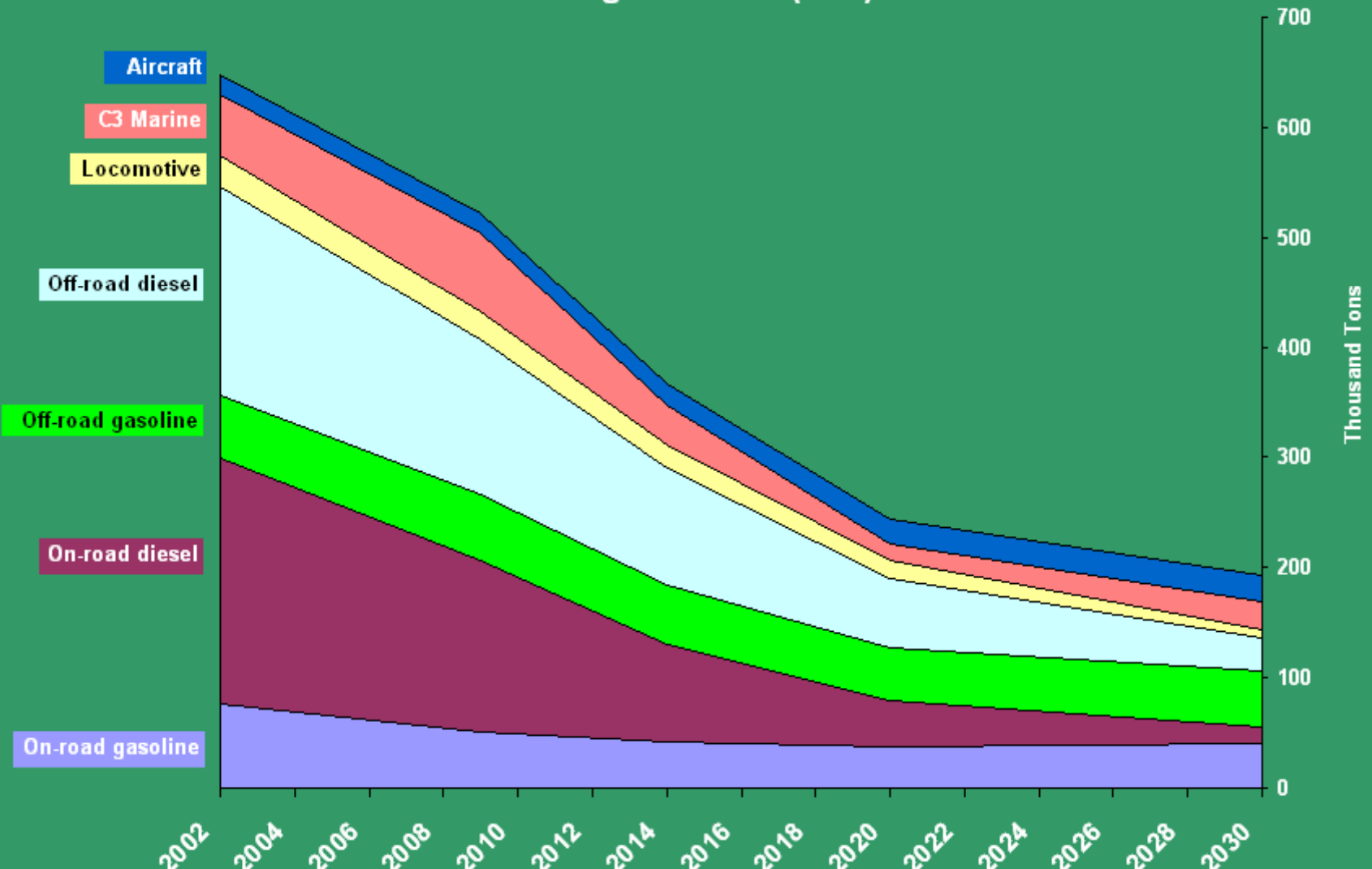
Emission Projections--NOx





Emission Projections—PM2.5

Annual U.S. Mobile Source PM2.5 Emission Projections Including C3 Marine (ECA) Control

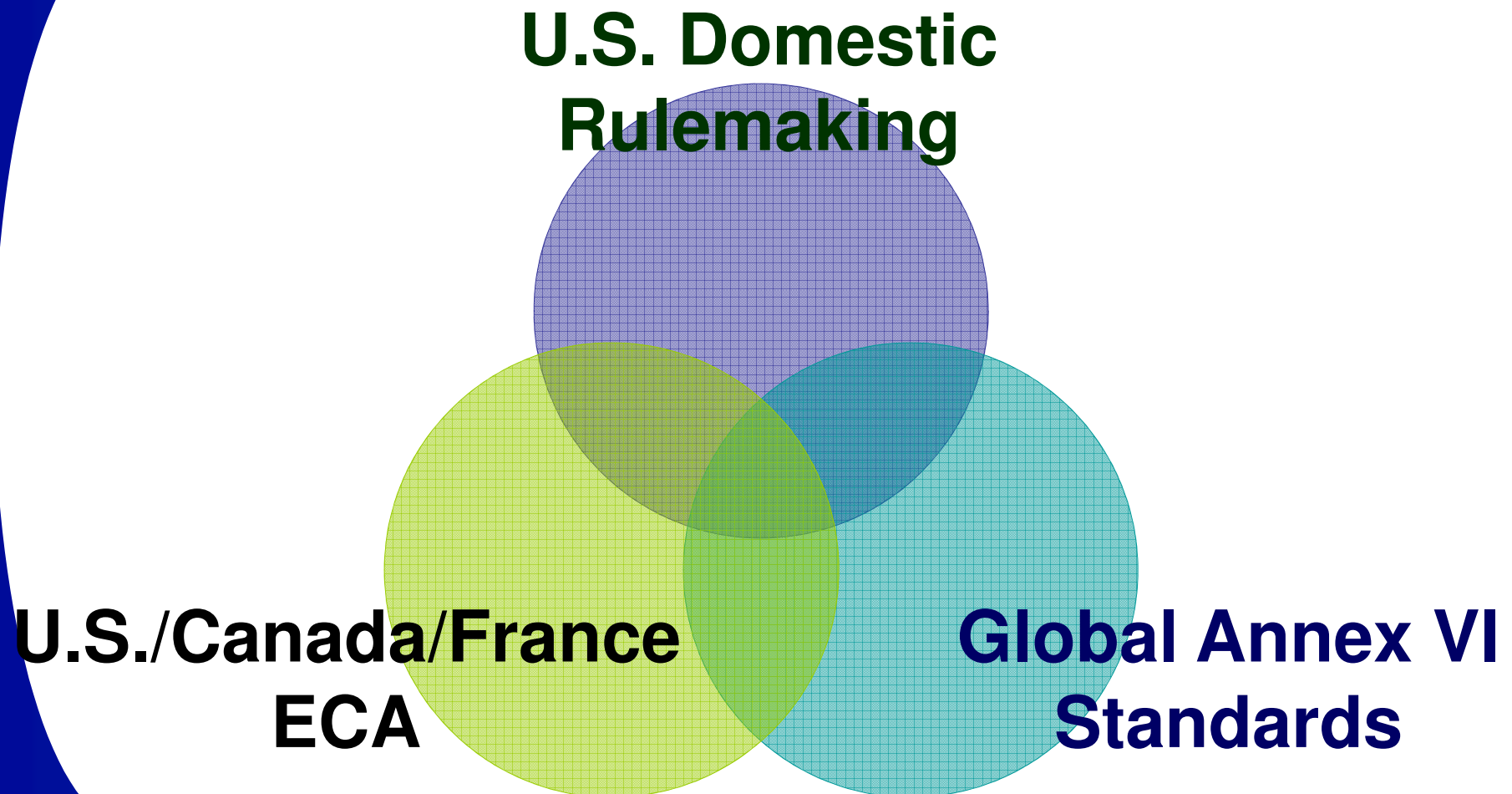




Federal Measures in the Pipeline



Ocean-going Vessels: Coordinated Strategy





U.S. Domestic Rulemaking

- Final Rule signed in December, 2009
- New engine standards
 - Tier 2 and 3 NO_x limits for U.S. vessels harmonized with MARPOL Annex VI
 - HC and CO cap standards for U.S. vessels
- New fuel sales standards
 - 0.1%S fuel limit for use in ECAs; unless equivalent technology used
 - Allow for 0.1%S distillate sales, in U.S., for marine use
- Adopts Annex VI implementation regulations for all vessels operating in U.S. waters



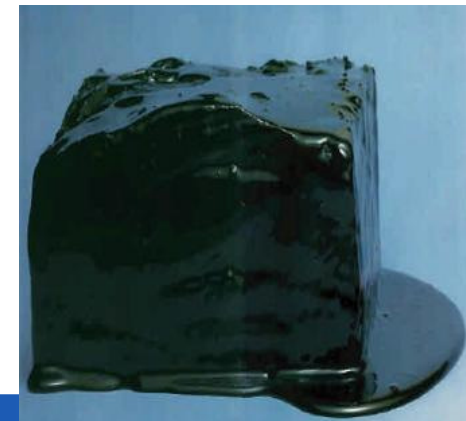
New Annex VI Amendments

- October 2008 Annex VI amendments approved
- Global NO_x Controls
 - Tier 2: 20% reduction from new vessels (2011)
 - Existing engine standards
- Global PM and SO_x controls
 - 2012: 3.5% fuel sulfur
 - 2020: 0.5% fuel sulfur
 - Could be delayed to 2025; subject to 2018 fuel availability review
- A country (or countries) can propose to designate an Emission Control Area (ECA), where more stringent standards apply



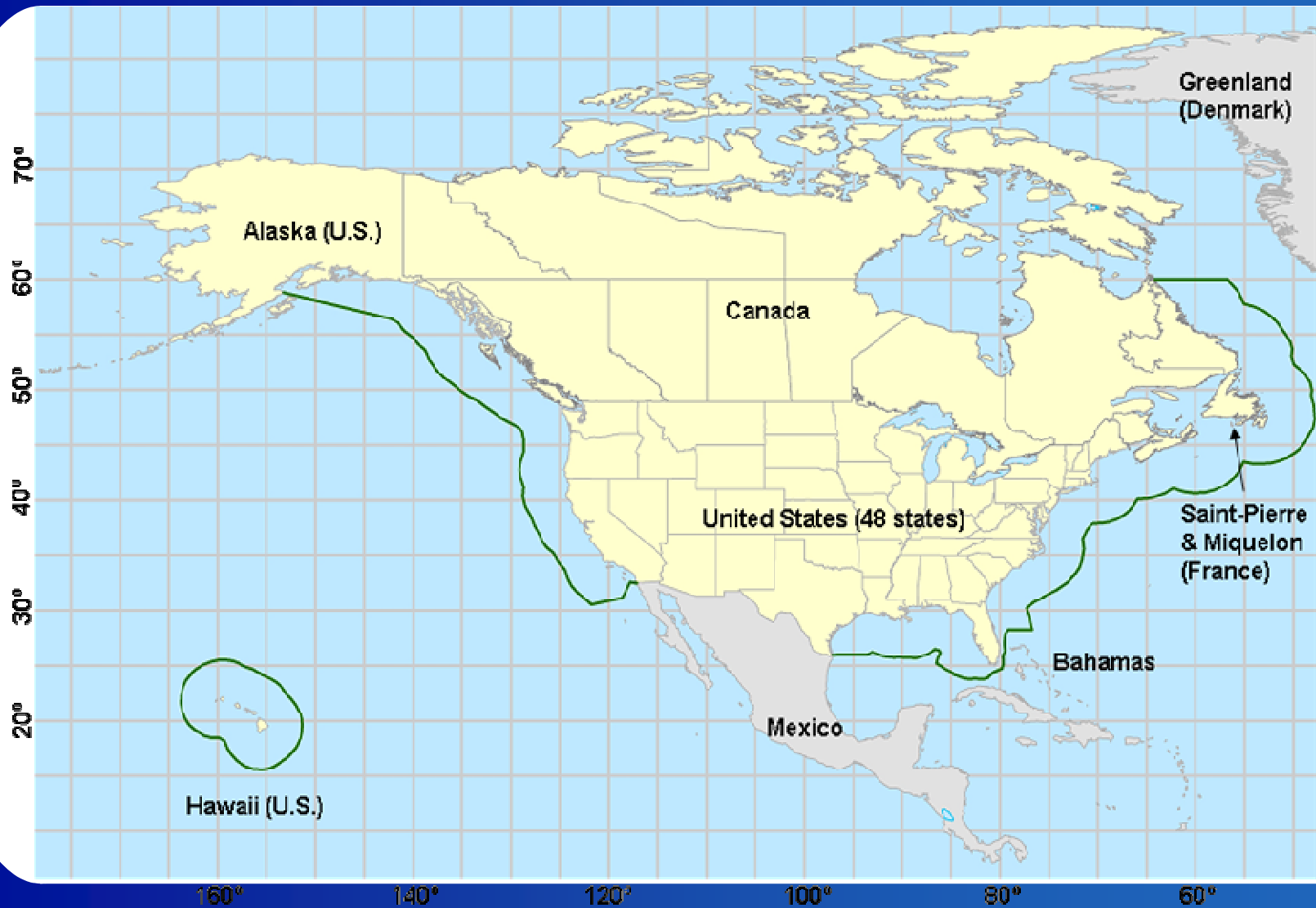
Emission Control Area

- On March 26, 2010, IMO adopted the North American ECA
 - The ECA fuel sulfur requirements will enter into force on August 1, 2012
- ECA NO_x Controls
 - Tier 3 NO_x 80% reduction new vessels (2016)
- ECA PM and SO_x Controls
 - 1.0% Fuel Sulfur (2010-2014)
 - 0.1% Fuel Sulfur 2015+
 - Up to 96% reduction in SO_x
 - ~85% reduction in PM



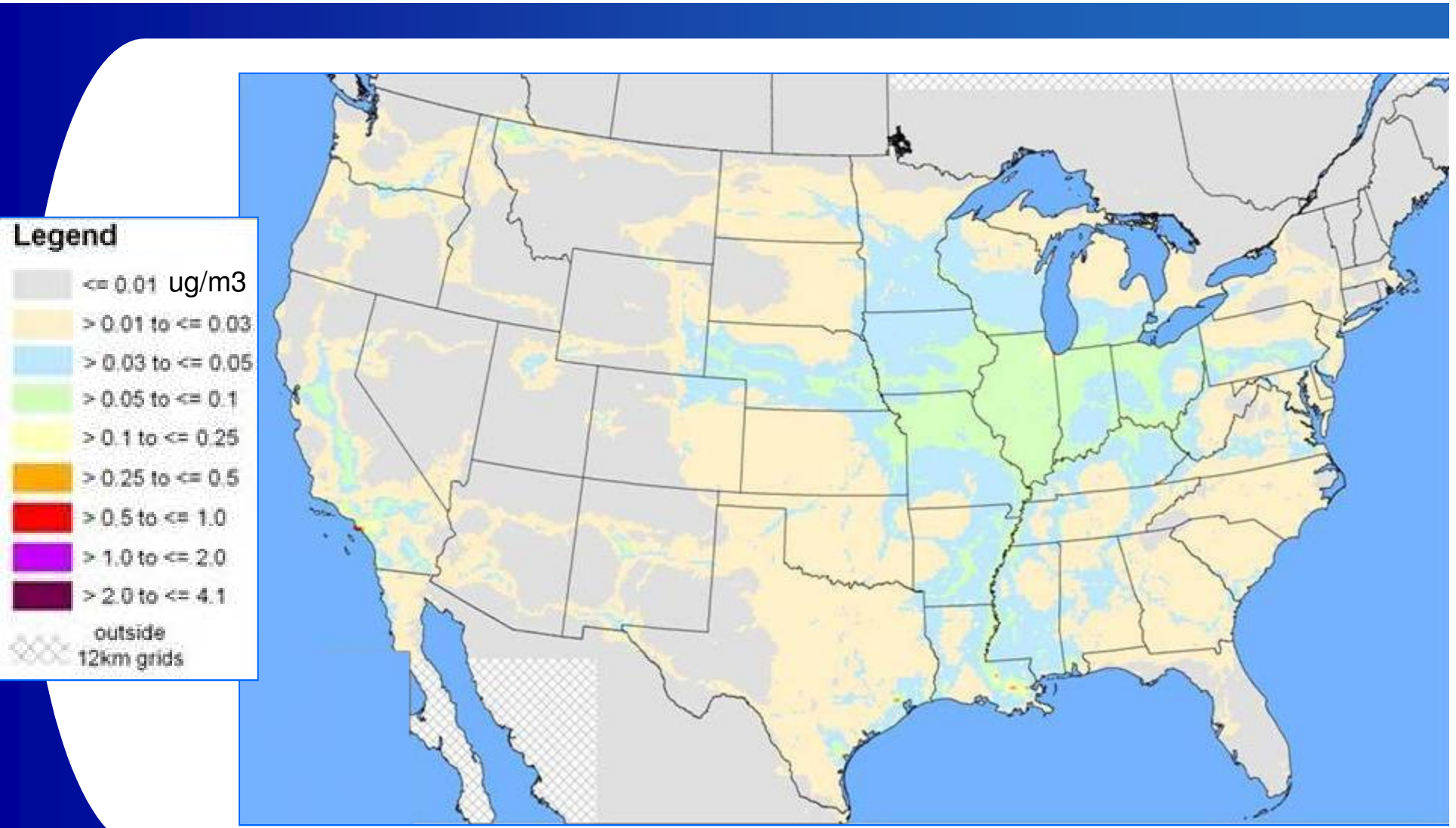


North American ECA



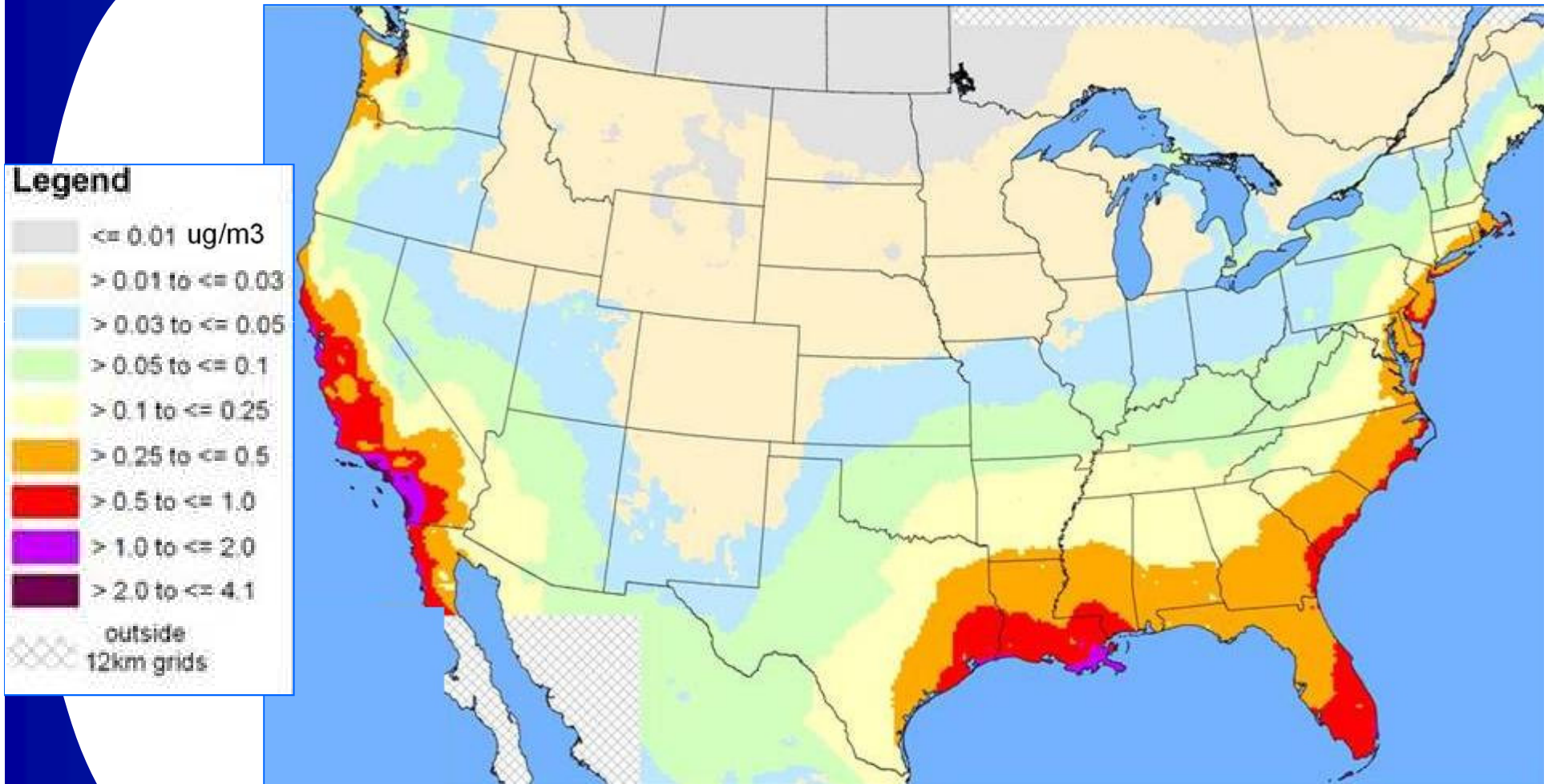


For Comparison: Impact of New Locomotive and Marine Diesel Engine Rule on PM_{2.5} levels in 2020



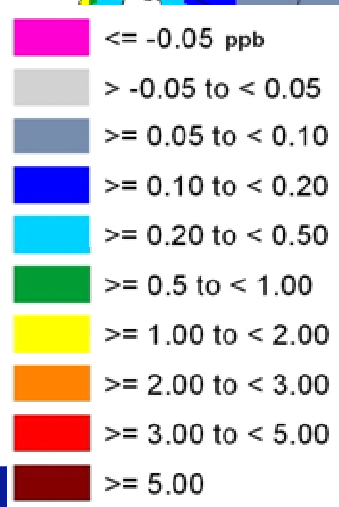
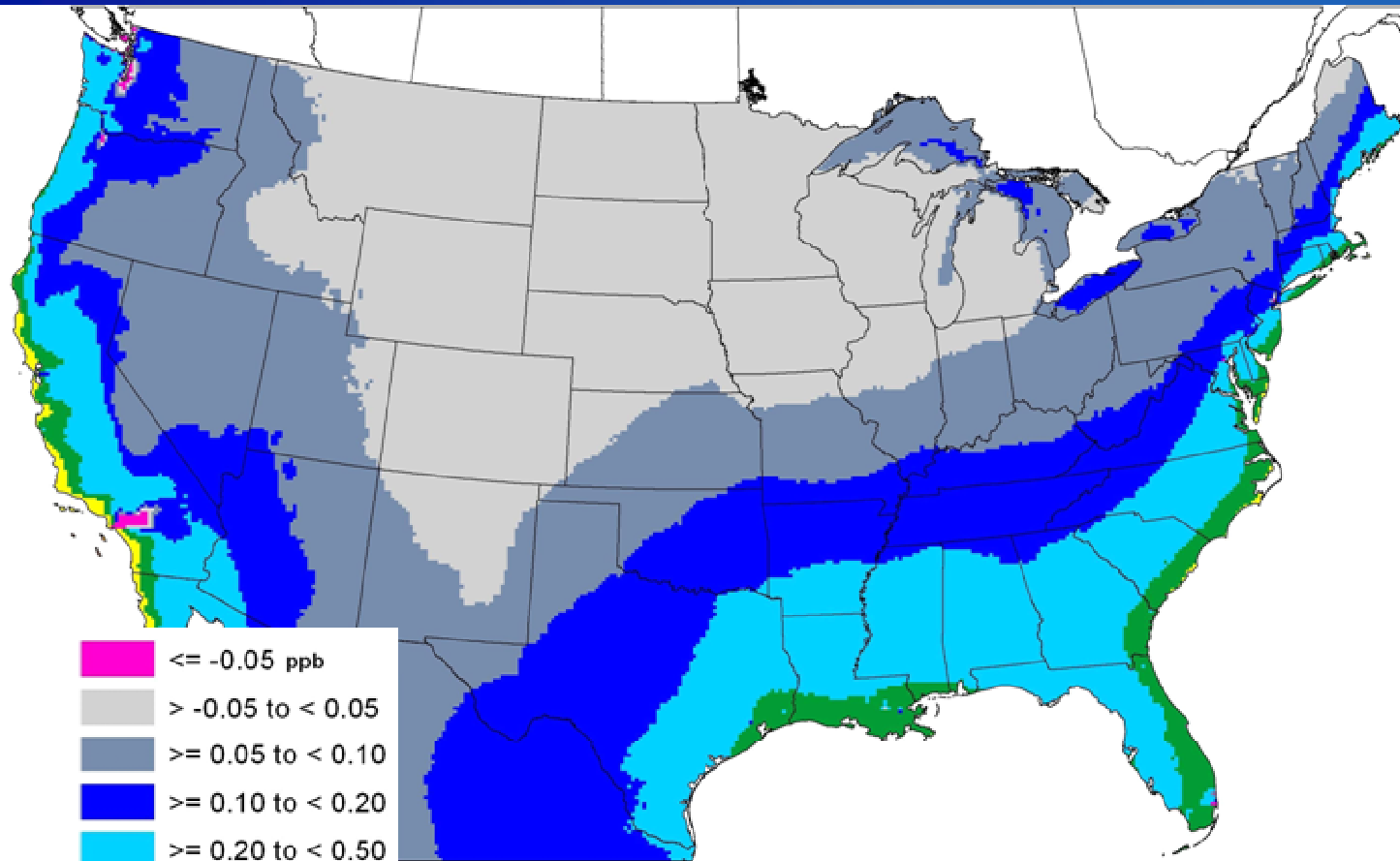


2020 Potential ECA PM_{2.5} Reductions





Potential 2020 ECA Ozone Reductions



Ozone (Smog) reductions from the proposed ECA reach well into the U.S. interior



Benefits and Costs

- In 2030 the estimated benefits are between \$110 and \$270 billion
- By 2030, the emission reductions associated with the coordinated strategy will annually prevent:
 - Between 12,000 and 30,000 PM-related premature deaths
 - Between 210 and 920 ozone-related premature deaths
 - About 1,400,000 work days lost
 - About 9,600,000 minor restricted-activity days
- The estimated costs are much smaller: \$3.1 billion



Mobile Source Clean Air Rules: *Comprehensively Addressing Air Pollutants*

- **Clean Cars and Passenger Trucks –Tier 2**
 - Stringent emissions standards for new gasoline and diesel light trucks and cars beginning in 2004
 - 90 percent reduction in gasoline sulfur content, beginning in 2006
 - National emissions reductions in 2030 of 3 million tons per year (tpy) of NO_x and 800,000 tpy of VOCs

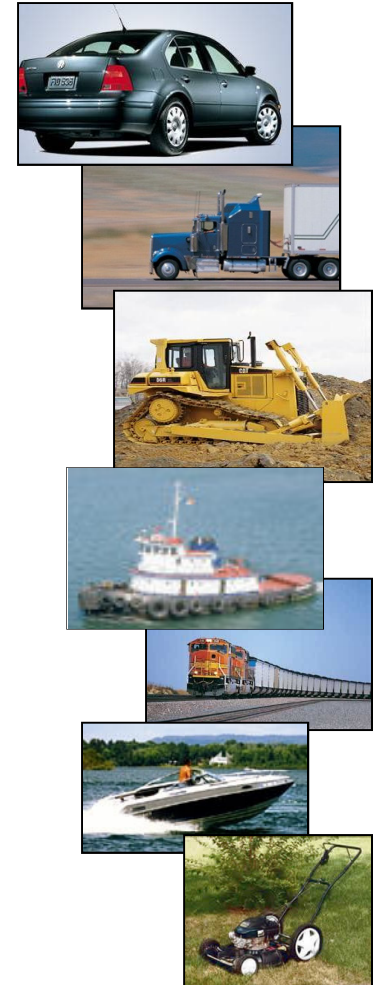




Mobile Source Clean Air Rules: *Comprehensively Addressing Air Pollutants*

- **Clean Heavy-Duty Trucks and Buses**

- Stringent emissions standards for new buses and trucks beginning in 2007
- 97 percent reduction in diesel sulfur content, phased in from 2006-2010
- Up to a 90% reduction in NO_x and PM emissions





Mobile Source Clean Air Rules: *Comprehensively Addressing Air Pollutants*

- **Clean Non-road Diesel Engines and Equipment**

- Stringent emissions standards many types of non-road equipment
 - Standards phase-in between 2008 and 2015 depending on engine size
- 99 percent reduction in diesel sulfur content, by 2010
 - Marine and locomotive diesel sulfur control in 2012
- NO_x and PM reductions > 90 percent





Mobile Source Clean Air Rules: *Comprehensively Addressing Air Pollutants*

- **Mobile Source Air Toxics Rule**
 - Fuel benzene standards beginning in 2011;
 - Cold temperature hydrocarbon standards for vehicles phased in between 2010 and 2015; and
 - Portable fuel container requirements beginning in 2009
 - Significantly reduces hydrocarbon air toxics while delivering PM co-benefits
 - National emissions reductions in 2030 of 1 million tpy of VOCs and 19,000 tpy of PM





Mobile Source Clean Air Rules: *Comprehensively Addressing Air Pollutants*

- **Locomotive and Marine Diesel Standards**
 - Requires the same technologies as on-highway and non-road diesel engines
 - Reduces PM by 90 percent and NO_x by 80 percent for newly-built locomotives and marine diesel engines
 - Tightens standards for existing locomotives and large marine diesel engines when they are remanufactured
 - Engine standards phase-in beginning 2009

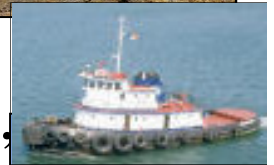


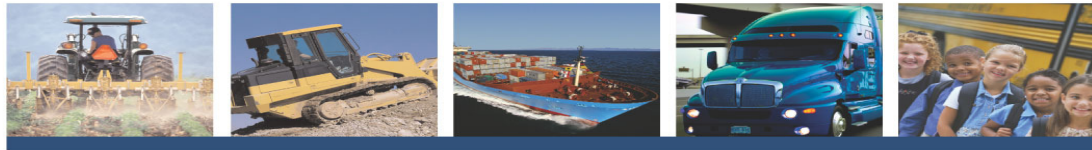


Mobile Source Clean Air Rules: *Comprehensively Addressing Air Pollutants*

• **Small Gasoline and Recreational Marine Standards**

- New exhaust emission standards take effect in 2010-2012 depending on engine type/size
- First time ever evaporative emission standards for these sources
- Covers lawn and garden, utility vehicles, generator, variety of other equipment, personal watercraft and outboard engines
- National emissions reductions in 2030 of 600,000 tpy of VOCs, 130,000 tpy of NO_x, 5,500 tpy of PM, and 1.5 million tpy of CO.





National Clean Diesel Campaign

- There are about 11 million existing, high-polluting diesel engines not subject to our new standards.
- Focus on Key Sectors:
 - School buses, marine ports, construction, agriculture, freight
- Promoting retrofitting, early replacement, and idle reduction
 - In FY-08 national grants funded 14,000 retrofits which reduced NOx emissions by 46,000 tons and PM emissions by 2,200 tons.



Update: Clean Diesel Funding

- Fiscal Year 2008 **\$49.2 M** Awarded
- 2009 Recovery Act **\$300 M** Awarded
 - 160 Grants
 - Preliminary projected results
 - 33,000 engines, vehicles, vessels
 - 5000 tons PM
 - 120,000 tons NOx
 - 850,000 tons CO2
 - \$1.2B - \$2.8B in health benefits (Pope, Laden)
- Fiscal Years 2009 & 2010 **\$120 M** Award in May-July
 - Almost 400 applications requesting about \$600 Million
 - Offering over \$1 Billion in matching funds



Resources for State and Local Agencies

- EPA's State Resources website at:
<http://www.epa.gov/otaq/stateresources/index.htm> includes links to:
 - Guidance documents, models and calculators for quantifying emissions reductions from a wide range of mobile source measures
 - Regulations for on-road and non-road sources
 - Clean Diesel State and Local Tool Kit
 - Information on various funding sources
- EPA's MOVES website at:
<http://www.epa.gov/otaq/models/moves/index.htm>
 - Software, instructions, technical guidance



Appendix



Summary: New OGV Requirements

- **Ocean-going Vessels**

- *40% of NO_x and 48% of PM emissions in 2030*
- In March 2009, the US proposed (to IMO) to designate US coastlines as Emission Control Areas (ECAs)
- In March 2010, the IMO officially adopted the ECA designation
- Fuel Quality Standards
 - 30% fuel sulfur reduction by 2012
 - 97% fuel sulfur reduction by 2015
- Existing engines – 15-20% reduction in NO_x starting in 2010
- New engines
 - 20% reduction in NO_x beginning in 2011
 - 80% NO_x reduction beginning in 2016



- EPA finalized regulations in December 2009 to implement