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Diesel Exhaust Fluid Forum

The road to EPA 2010 for industry and regulators

Tuesday, 11 November

For more information on the Diesel Exhaust Fluid Forum please contact
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The Road to EPA 2010



Diesel Exhaust Fluid Forum

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U.S. EPA Office of Transportation and Air Quality

November 11, 2008

Overview

- EPA Office Transportation & Air Quality
- Why do we need to control emissions?
- EPA's National Clean Diesel Campaign
- EPA and Urea SCR
- Our Mutual Roles Going Forward





Office of Transportation and Air Quality

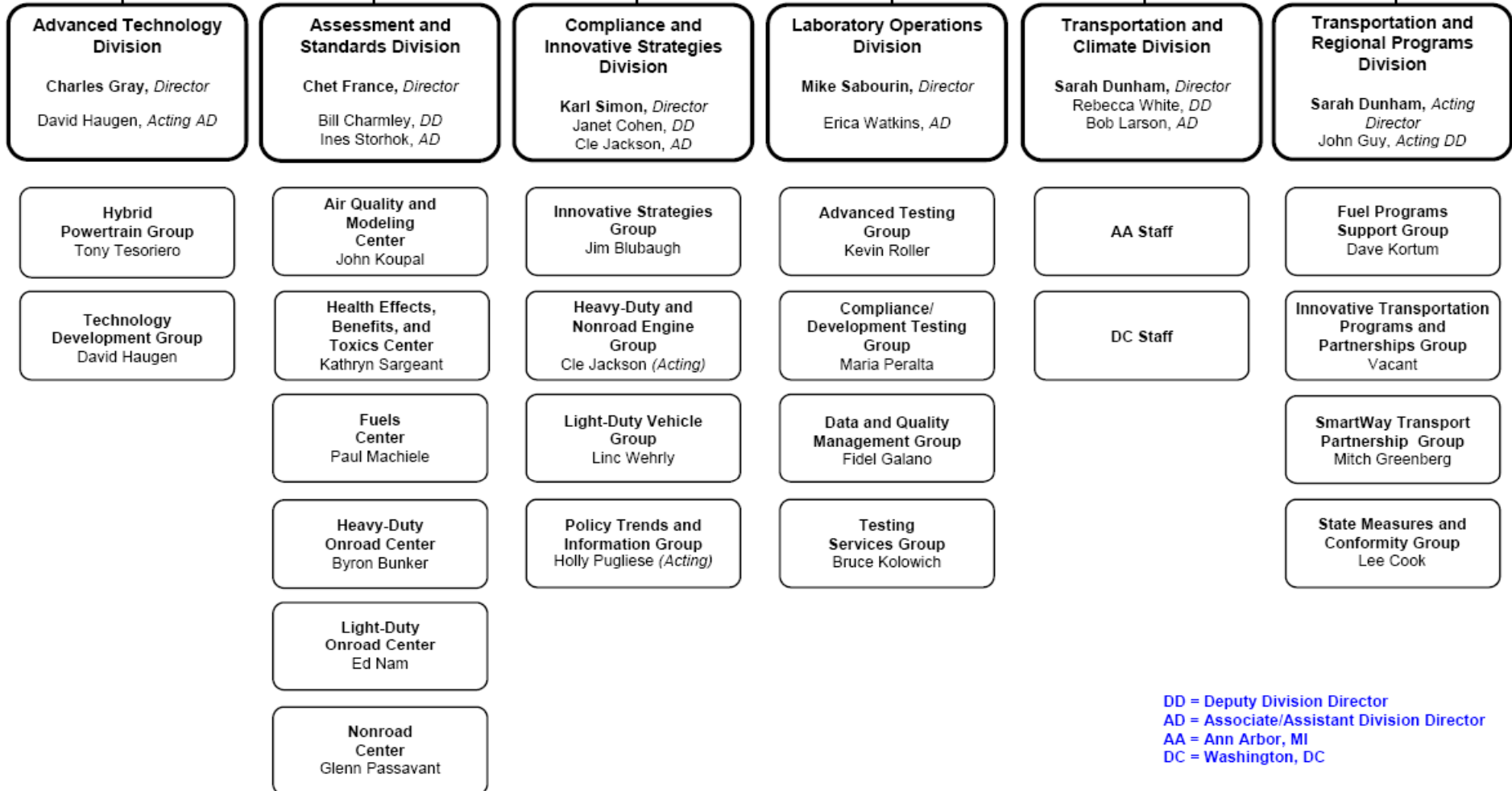
October 2008

Margo Tsirigotis Oge, Office Director

Lori Stewart, Associate Office Director
 Karen Orehowsky, Chief of Staff
 Mike Haley, Planning & Budget Office

Christopher Grundler, Deputy Office Director

Tracey Bradish, Public Information and Human Resources
 Amy Caldwell, Centralized Services Group Manager

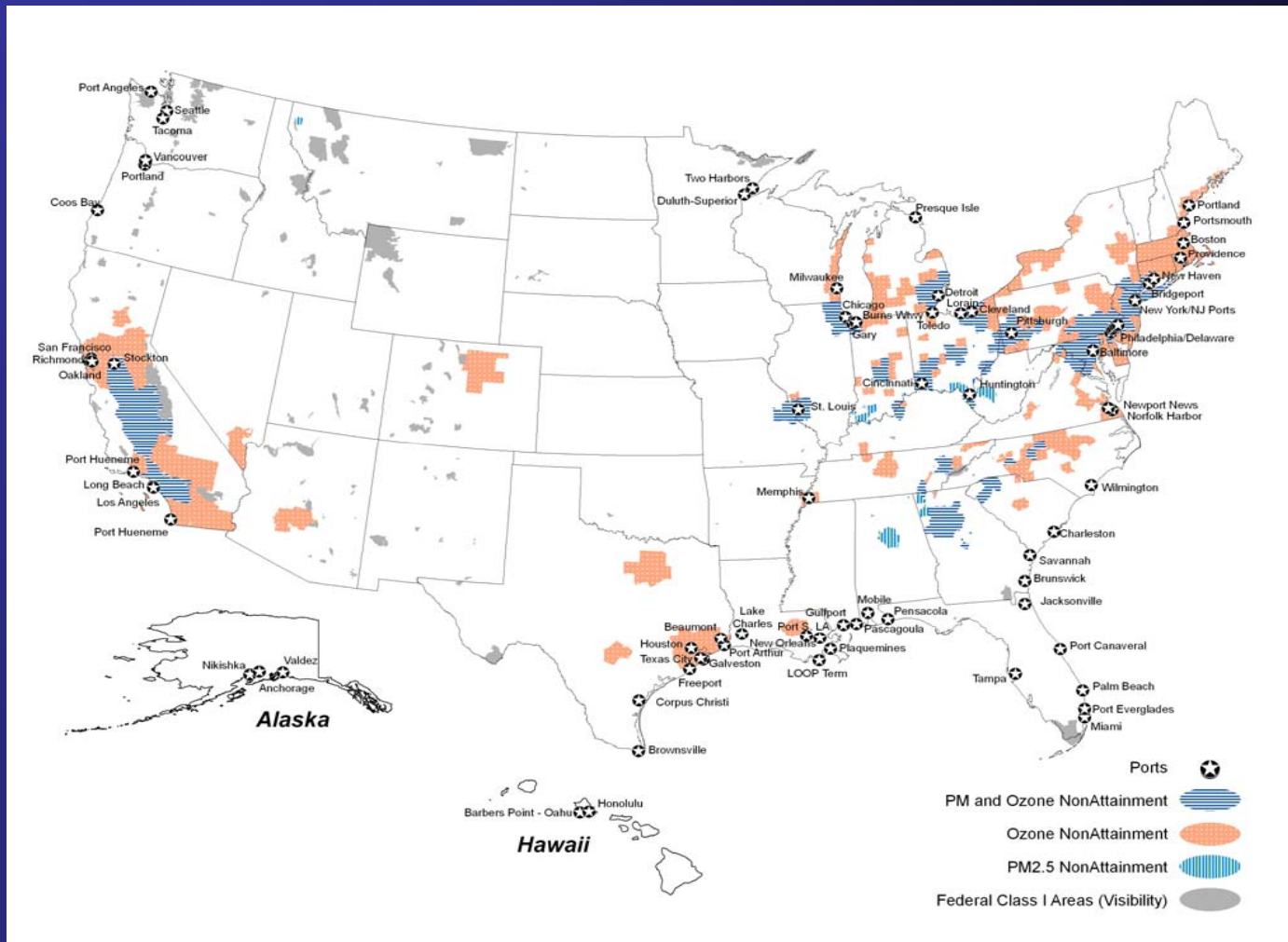


DD = Deputy Division Director
 AD = Associate/Assistant Division Director
 AA = Ann Arbor, MI
 DC = Washington, DC

Why do we need to control emissions?



Large Portions of US Do Not Meet the National Ambient Air Quality Standards

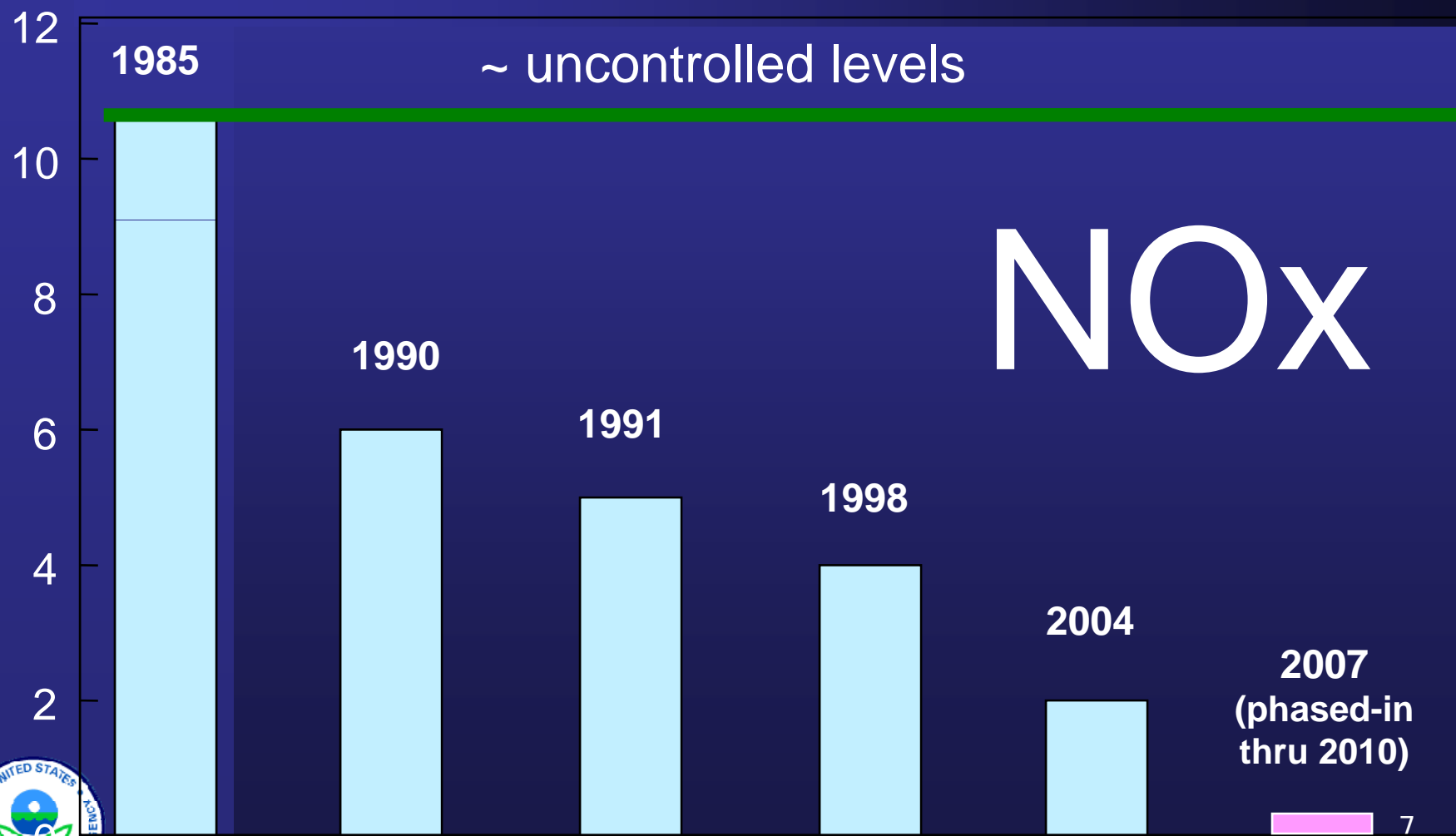


Air Quality Need & Public Health Concerns

- Diesel trucks and buses comprise 28% of the NO_x and 20% of the PM from U.S. mobile source emissions.
- Contributions are even higher in some areas with serious air quality problems.
- Diesel exhaust has been implicated in an increased risk of lung cancer and respiratory disease.
- EPA has concluded that diesel exhaust is a likely human carcinogen.
- PM and NO_x from diesel contribute to asthma and other serious respiratory health problems.

Highway Diesel Standards

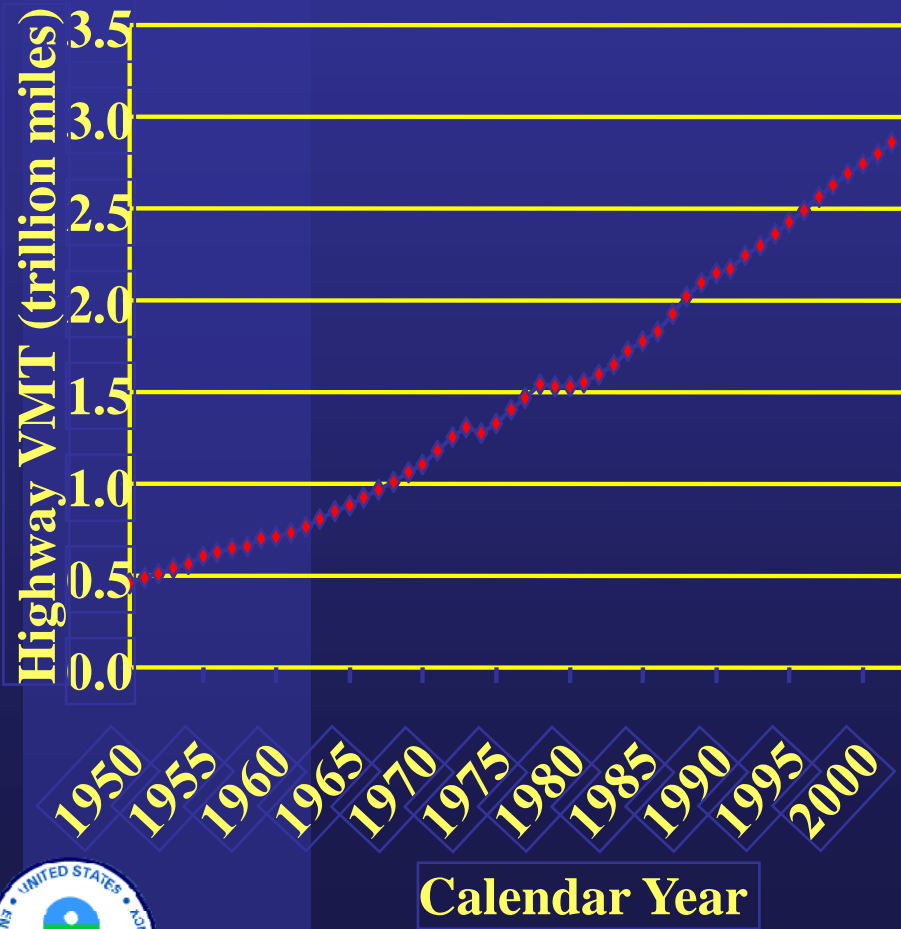
grams per hp-hour



NOx

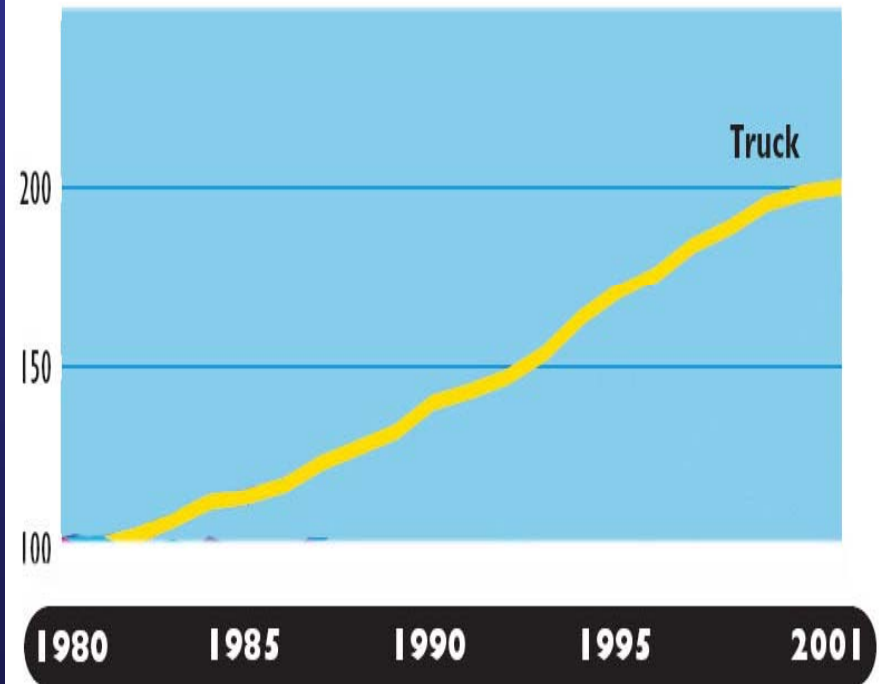


Growth In Transportation Offsets Gains from Cleaner Vehicles



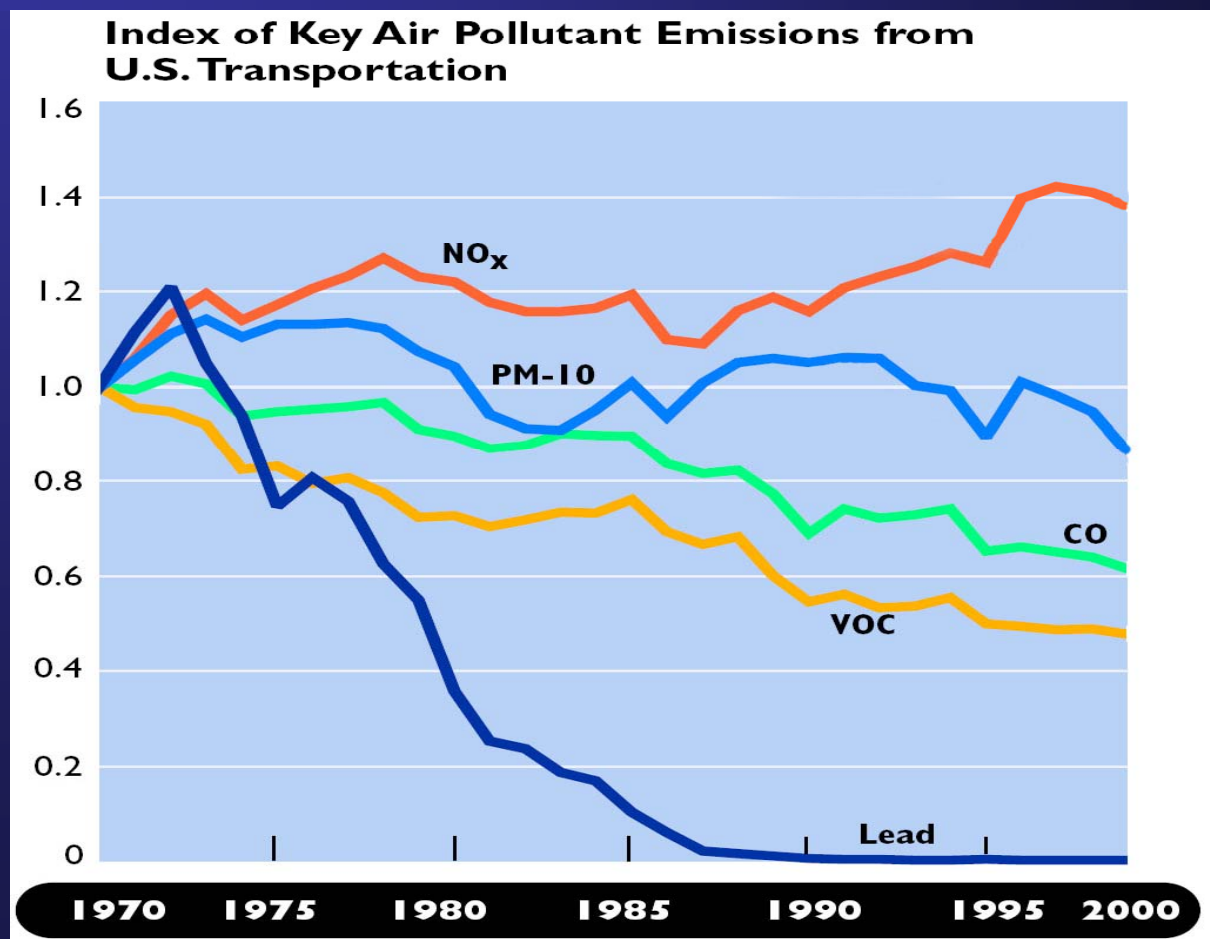
Calendar Year

Growth Trends of U.S. Domestic Freight
Ton-Miles by Mode: 1980-2001



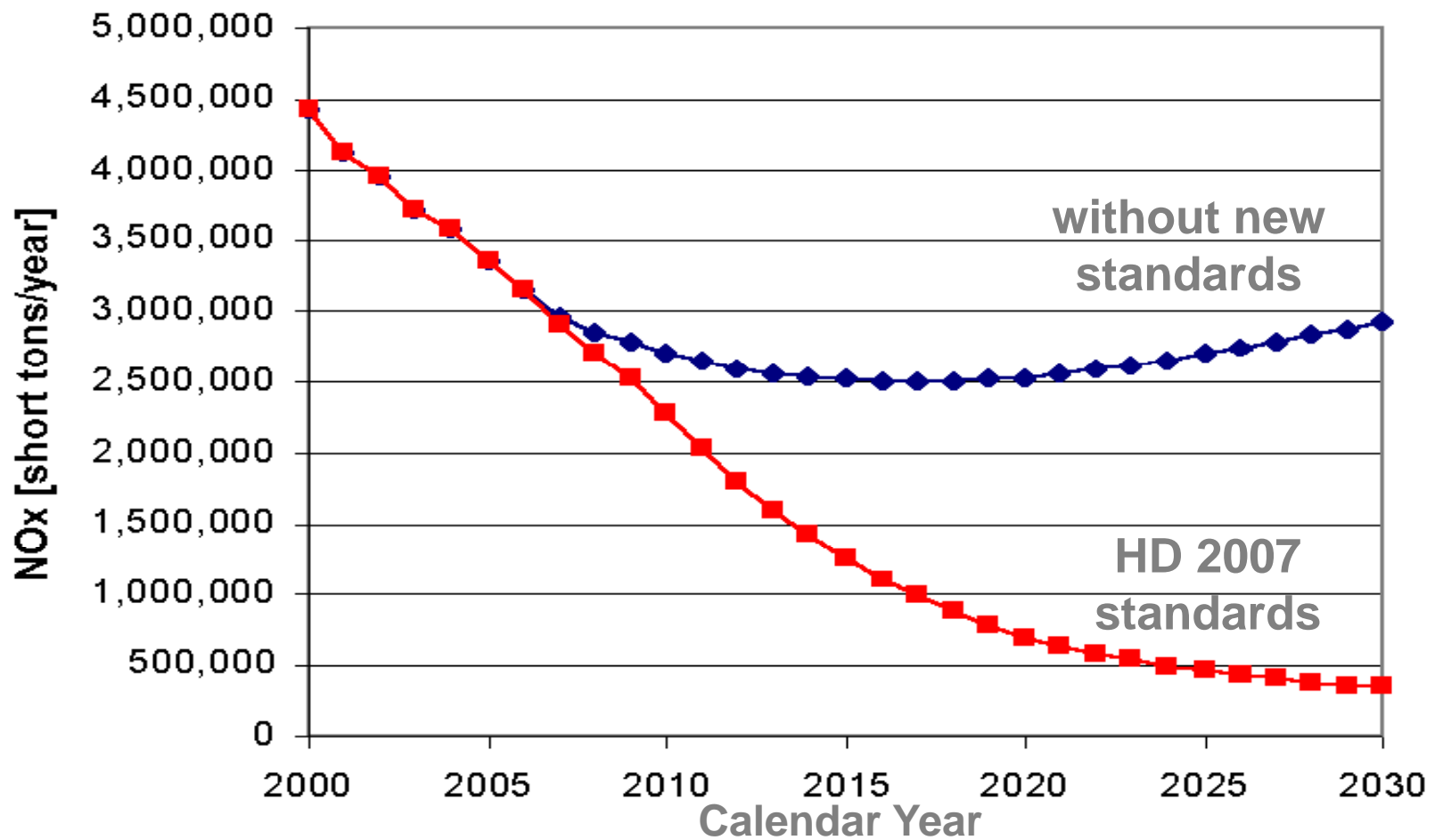
Source: U.S. Department of Transportation – Bureau of Transportation Statistics

Emission Trends



Source: U.S. Department of Transportation – Bureau of Transportation Statistics

Nationwide Heavy-Duty NOx Emissions



NATURAL RESOURCES DEFENSE COUNCIL

The Campaign to Dump Dirty Diesel

Environmentalists are taking on powerful industries to rid the world of the smoke, smells, and health risks of diesel exhaust.

Diesel Pollution Poses Growing Health Threat

Thursday, February 24, 2005

By Todd Zwillich

WebMD

San Francisco Chronicle

Diesel school buses double pollution exposure

Jane Kay, Chronicle Environment Writer

Thursday, October 16, 2003

New York Daily News

April 20, 2005

Diesel pollution targeted

Clean air bills would require ultra-low fuel

BY FRANK LOMBARDI

DAILY NEWS CITY HALL BUREAU

The City Council will vote today to choke off those black plumes of diesel pollution emitted by city-owned and contracted vehicles - including 6,000 buses.



Reducing the Health Impacts of Diesel Pollution In California



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

EPA's National Clean Diesel Campaign (NCDC)



National Clean Diesel Campaign

- Regulations for new engines & low sulfur diesel fuel
 - Light-duty Tier 2 passenger vehicles , Heavy-Duty Diesel Highway, Nonroad Diesel Engines, Locomotive and Marine
 - Upcoming standards Ocean Going Vessels
- Voluntary Programs to **address diesel legacy fleet**
 - Retrofit Program
 - Diesel exhaust catalysts, PM filters, engine modification technologies, cleaner fuels, idle reduction, etc...
 - SmartWay Transport Program
 - Idle reduction, tires, logistics, lubricants, aerodynamics, speed management, etc...



EPA's National Clean Diesel Campaign Regulatory Roadmap

Tier 2 Light-Duty

final rule 1999

fully phased in 2009

Diesels held to same stringent standards as gasoline vehicles



These standard-setting rulemakings are key enablers for collaborative partnerships with industry and state & local governments



Heavy-Duty Highway

sales 800,000 / yr

40B gallons / yr

final rule 2000

fully phased in 2010



Ocean Going Vessels

C3 Rule Dec 2009

IMO MARPOL Annex VI

ECA Controls

- Fuel Based 2015
- SCR Catalyst Based 2016



Nonroad Diesel

sales over 650,000 / yr

12B gallons / yr

final rule 2004

fully phased in 2014



Locomotive/Marine

sales 40,000 marine engines,

1,000 locomotives / yr

6B gallons / yr

final rule 2008

fully phased in 2017



EPA's National Clean Diesel Campaign: Technology Roadmap Mile Markers

- Year NOx Standards Premised on Diesel Aftertreatment Become Mandatory
 - 2009 Light-Duty Tier 2 Cars
 - 2010 Heavy-Duty Trucks
 - 2014 Nonroad Equipment
 - 2014 Largest C2 Marine
 - 2015 Locomotives
 - 2017 C1 Marine
 - 2016 C3 Ocean Going Vessels
 - IMO Annex VI Tier 3 standards



Clean Fuel/Engine Standards will Lead to Substantial Air Quality / Health Benefits

2030 Annual	Light-duty Tier 2	Heavy-duty 2007	Nonroad Diesel Tier4	Total
Cost	\$5 billion	\$4 billion	\$2 billion	\$11 billion
Benefits	\$25 billion	\$70 billion	\$80 billion	\$175 billion
Avoided Premature Mortality	4,300	8,300	12,000	24,600
Avoided Hospital Admission	3,000	7,100	8,900	19,000
Avoided Lost Work Days	0.7 million	1.5 million	1.0 million	3.2 million



EPA and Urea SCR



What's Special About SCR?

Selective Catalytic Reduction is similar to other diesel emission control technologies in many ways--

- hardware is mounted in the exhaust stream
- relies on catalyst-fostered chemical reactions
- requires sophisticated electronic controllers
- can yield high reduction efficiencies (90%+)

BUT...without DEF, emissions can increase by 10x or even more



EPA's Issues with Urea SCR

Depends on the user to add DEF when necessary. How can we be assured that will happen?

- Driver Inducement-

- Ensure that vehicles will meet the standards in use (that drivers will not drive with empty DEF tanks).

- DEF infrastructure--

- Ensure that drivers will find DEF wherever they need it.



US EPA SCR Guidance Document

- EPA published draft guidance document in November 2006
 - Solicited public comment, reviewed stakeholder comments
- Issued final guidance March 2007
 - <http://www.epa.gov/otaq/cert/dearmfr/cisd0707.pdf>
- SCR guidance document
 - Gives examples of acceptable SCR system solutions to address refill
 - For example, no restart after a vehicle refuels with diesel fuel but not DEF
 - Allows for manufacturers to propose other options
 - Describes EPA expectations for DEF infrastructure:
 - Dealerships
 - Truck Stops
 - Back-up plan



Our Mutual Roles Going Forward



DEF should be readily available



Would you like
some DEF with
those fries?



Building a DEF infrastructure

- No single party can do it alone
 - Urea producers, distributors, retailers and customers
 - Regulators and engine/truck OEMs
- What can EPA do?
 - Provide clear and consistent messaging
 - Ensure all OEMs carry their fair share of the burden to ensure DEF availability
- Need to trust each other to deliver
 - Similar to 2006 ULSD introduction



Trust the following

- 2010 standards aren't changing
 - NAAQ standards, States, and NCDC
 - Large public health and welfare benefits
- NCDC will drive additional demand
- EPA will ensure OEMs each do their part to build DEF infrastructure
- Trucking industry is fundamentally about logistics, this community can handle DEF



Key to success will be how we answer the trucking industry's questions?

- Will DEF be readily available?
- What will DEF cost?
- What will DEF refilling mean for my drivers?



Conclusion

- US 2007/10 first big step in National Clean Diesel Campaign
- Reductions are critical to State and community plans to address AQ problems
- EPA will require engine OEMs to demonstrate DEF will be readily available
- To succeed we all need to work together
 - Urea suppliers, distributors, retailers, regulators and trucking fleets

