

# Meeting EPA's 2010 Regulations



New York City Lower Hudson Valley Clean Communities, Inc.

Bio-Diesel Workshop & EPA 2010 Heavy Duty Truck  
Emission Regulations

April 21, 2010

# Overview

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- Why do we need to control emissions?
- EPA's National Clean Diesel Campaign
- Rules and Regulations
- Implementing Heavy Duty Diesel Standards
- Biodiesel / Waste Vegetable Oil

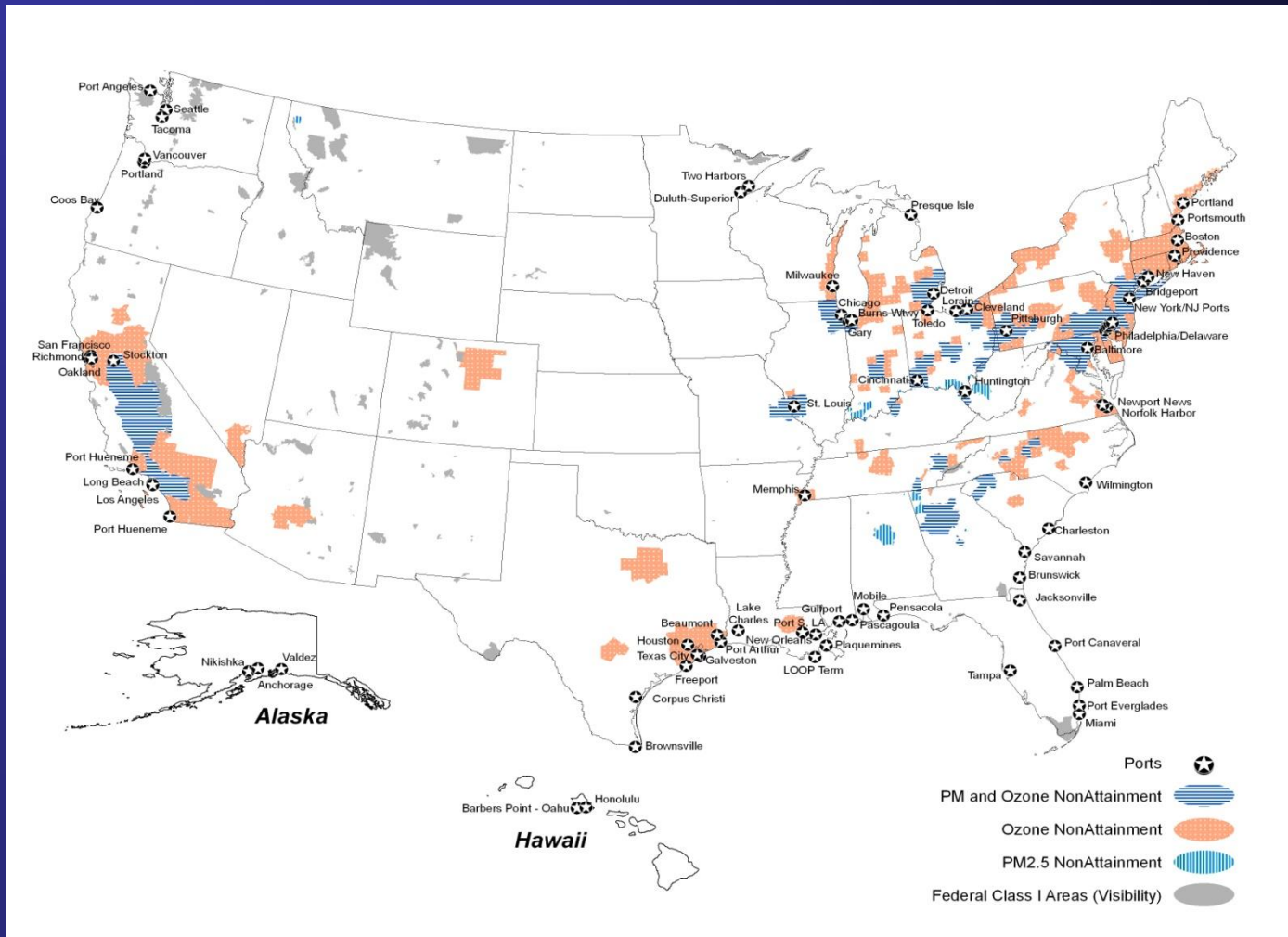


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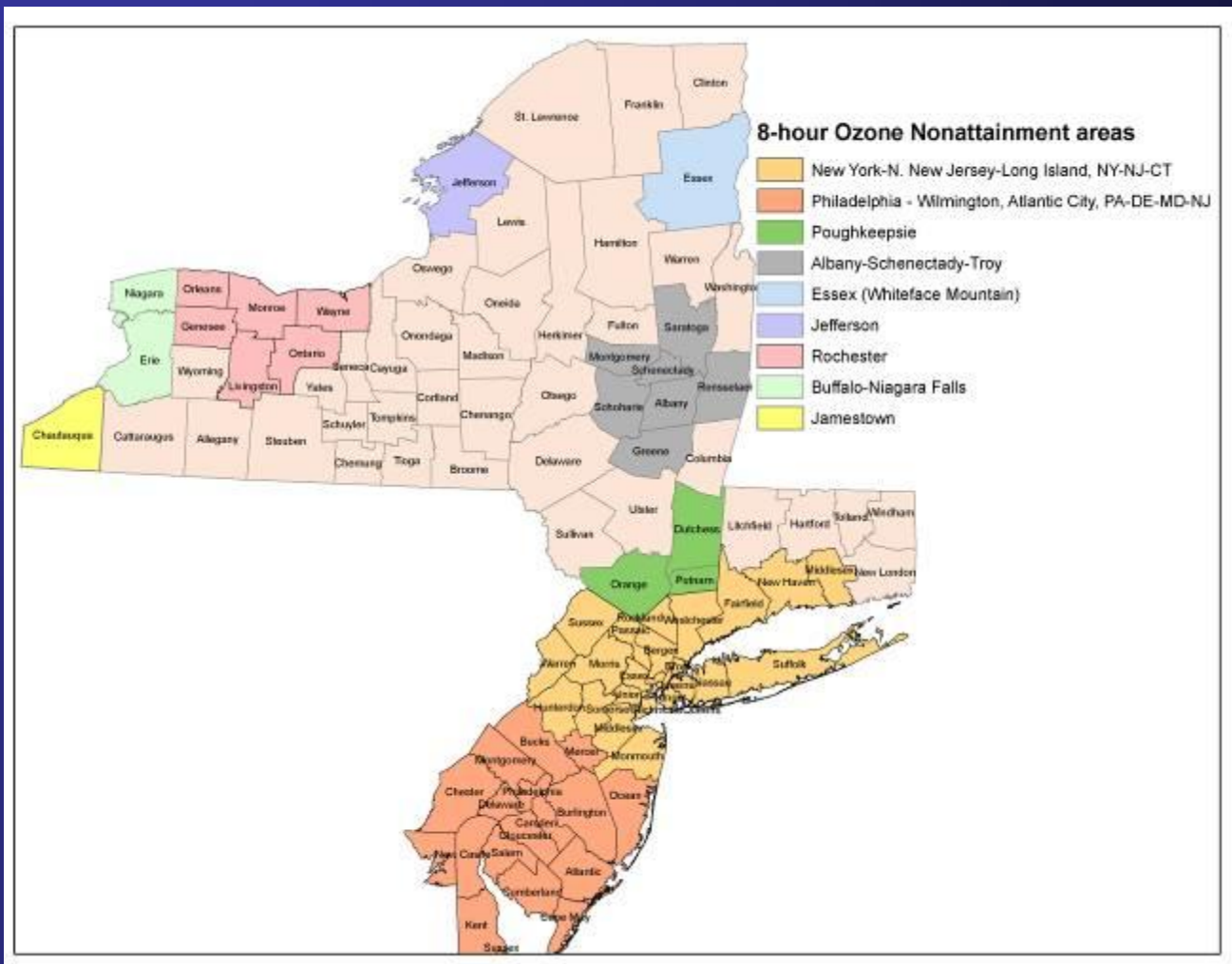
# Why do we need to control diesel emissions?



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



# R2 Ozone Nonattainment Areas



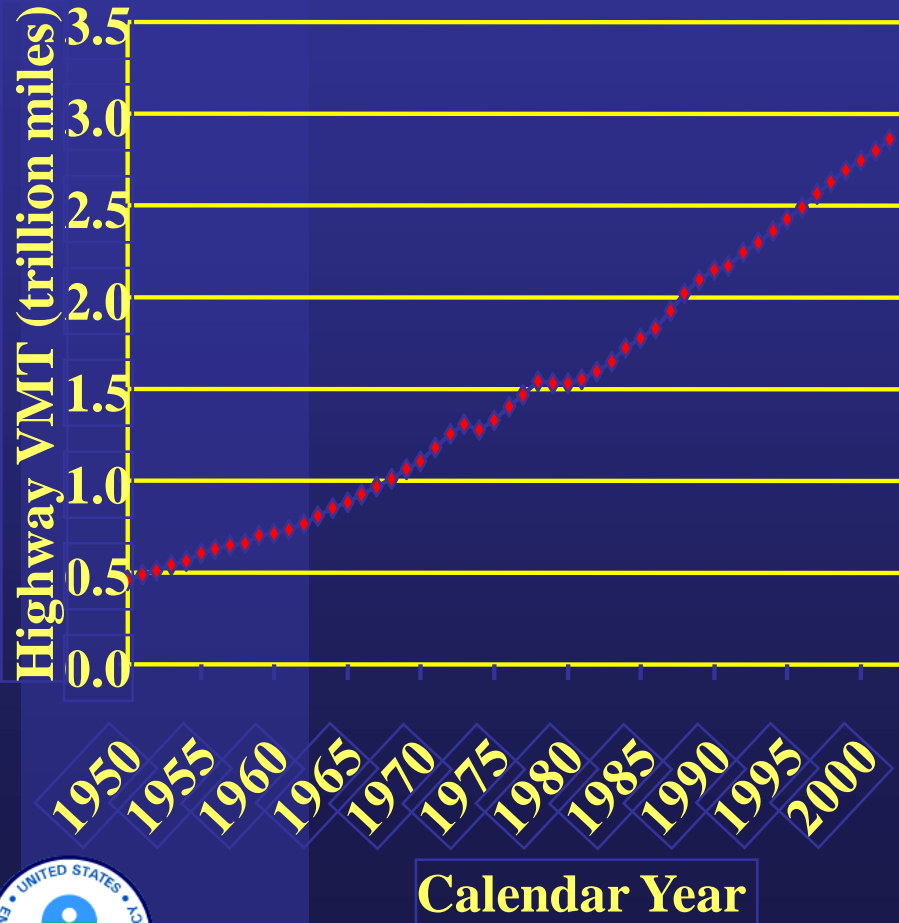


# *Air Quality Need & Public Health Concerns*

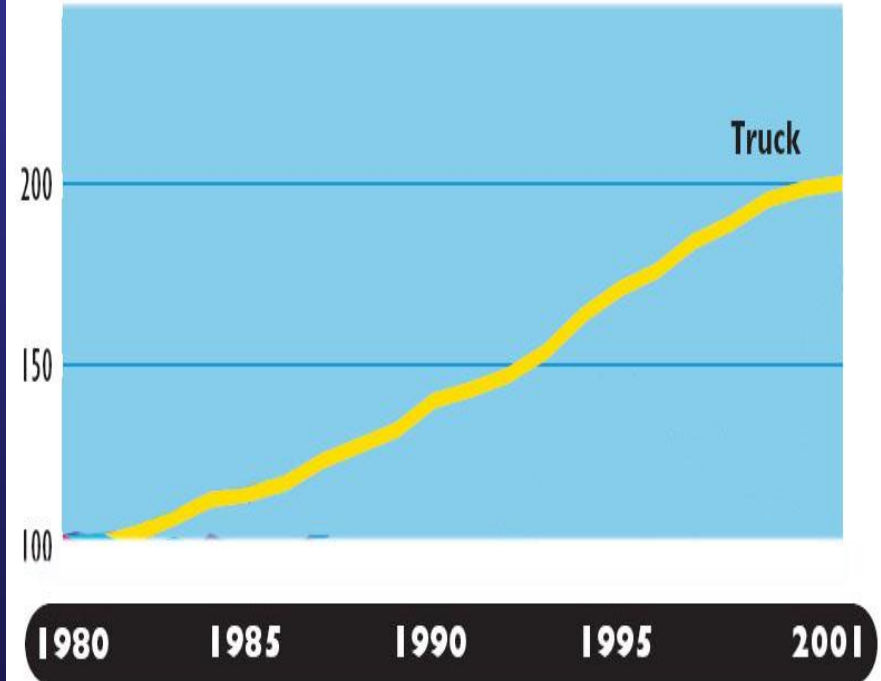
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- Diesel trucks and buses comprise 28% of the NO<sub>x</sub> and 20% of the PM from U.S. mobile source emissions.
- Contributions are even higher in some areas with serious air quality problems.
- Diesel exhaust has been implicated in an increased risk of lung cancer and respiratory disease.
- PM and NO<sub>x</sub> from diesel contribute to asthma.
- EPA has concluded that diesel exhaust is a likely human carcinogen.

# Growth In Transportation Offsets Gains from Cleaner Vehicles



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



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



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# EPA's National Clean Diesel Campaign (NCDC)



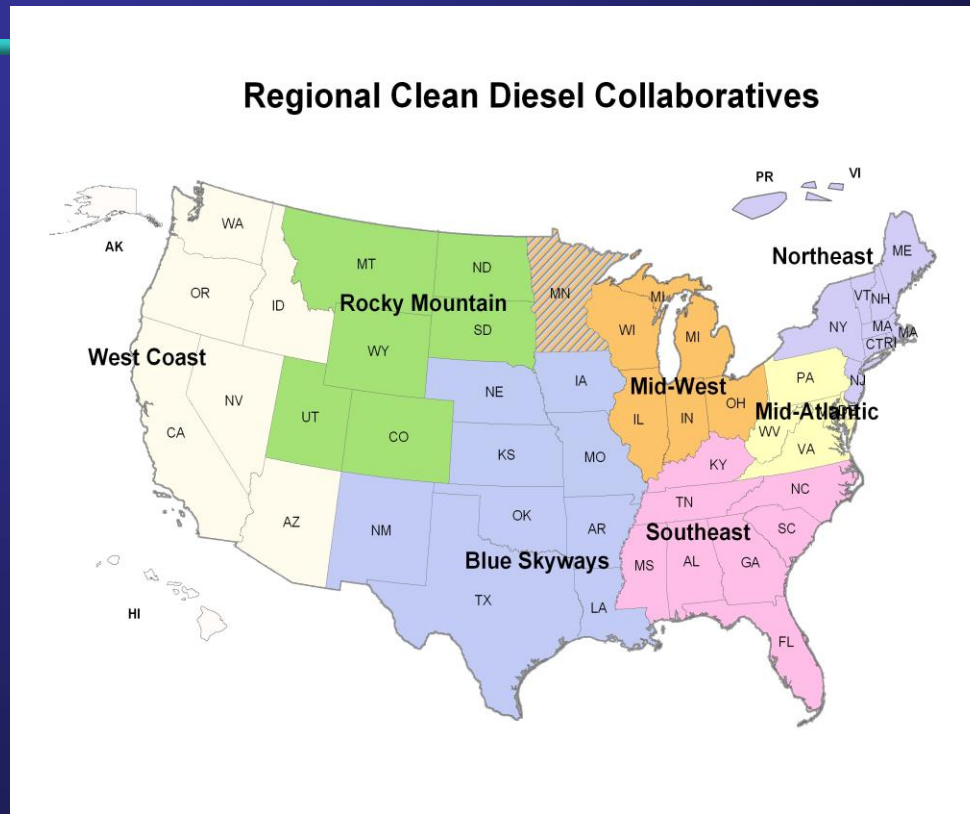
# *National Clean Diesel Campaign*

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- Regulations for new mobile sources
- Regulations for fuel
- Voluntary partnerships to address diesel legacy fleet



# DERA Grant Opportunities



- Types of projects: Retrofits, diesel exhaust catalysts, diesel particulate filters, engine repowers, cleaner fuels, idle reduction technologies, etc...
- Eligible entities: non-profit organization may apply on behalf of truckers



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# Rules and Regulations



# 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



## 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



## Ocean Going Vessels

C3 Rule Dec 2009

IMO MARPOL Annex VI

ECA Controls

- Fuel Based 2015
- SCR Catalyst Based 2016

Note: sales and diesel fuel usage vary year-to-year, these figures are for comparison purposes only



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# Implementing Heavy Duty Diesel Standards



# Key Elements of the Engine & Vehicle Program

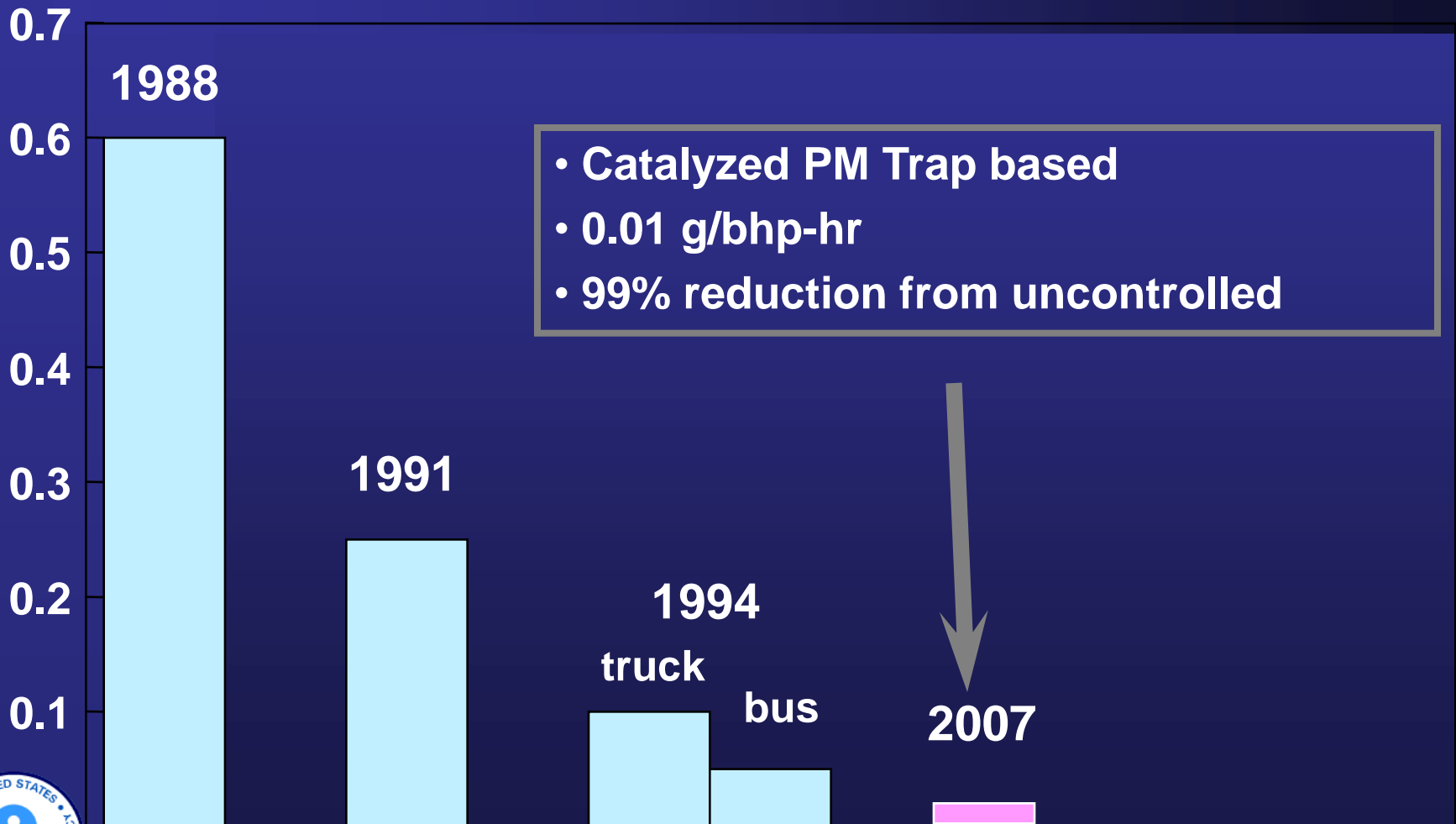
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- Applies new NO<sub>x</sub> and PM standards to heavy-duty engines and vehicles
  - 90%+ emission reductions — gasoline-like levels
  - Based on high efficiency emission control devices (like passenger vehicle catalysts)
  - Phase-in of NO<sub>x</sub> standards 2007-2010
  - Incentives for early technology introduction

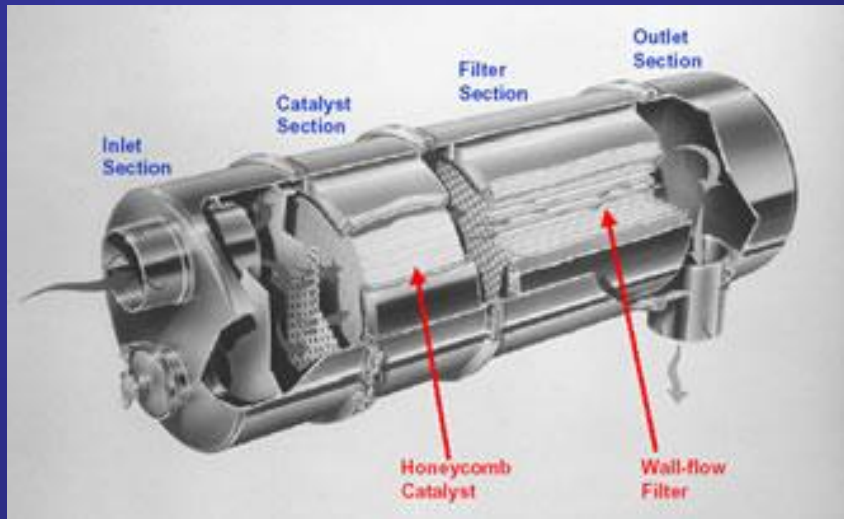


# Highway Diesel PM Standards

g/hp-hr

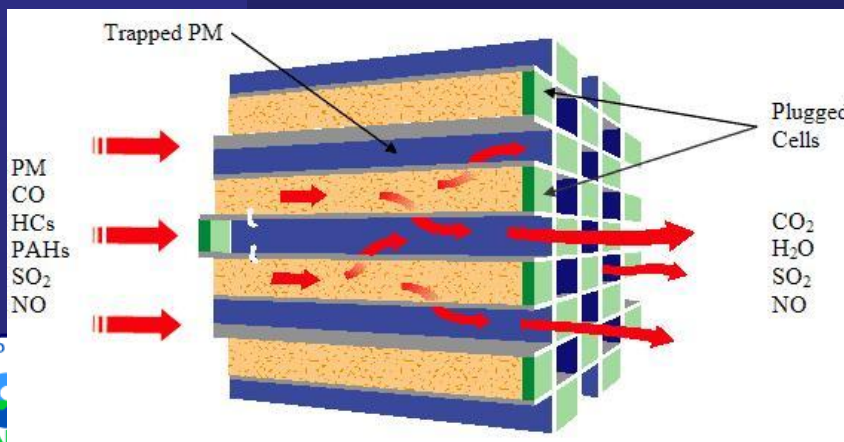


# Retrofits and Reductions



diesel oxidative catalysts (DOC) removes:

- 40% PM
- 0-5% BC



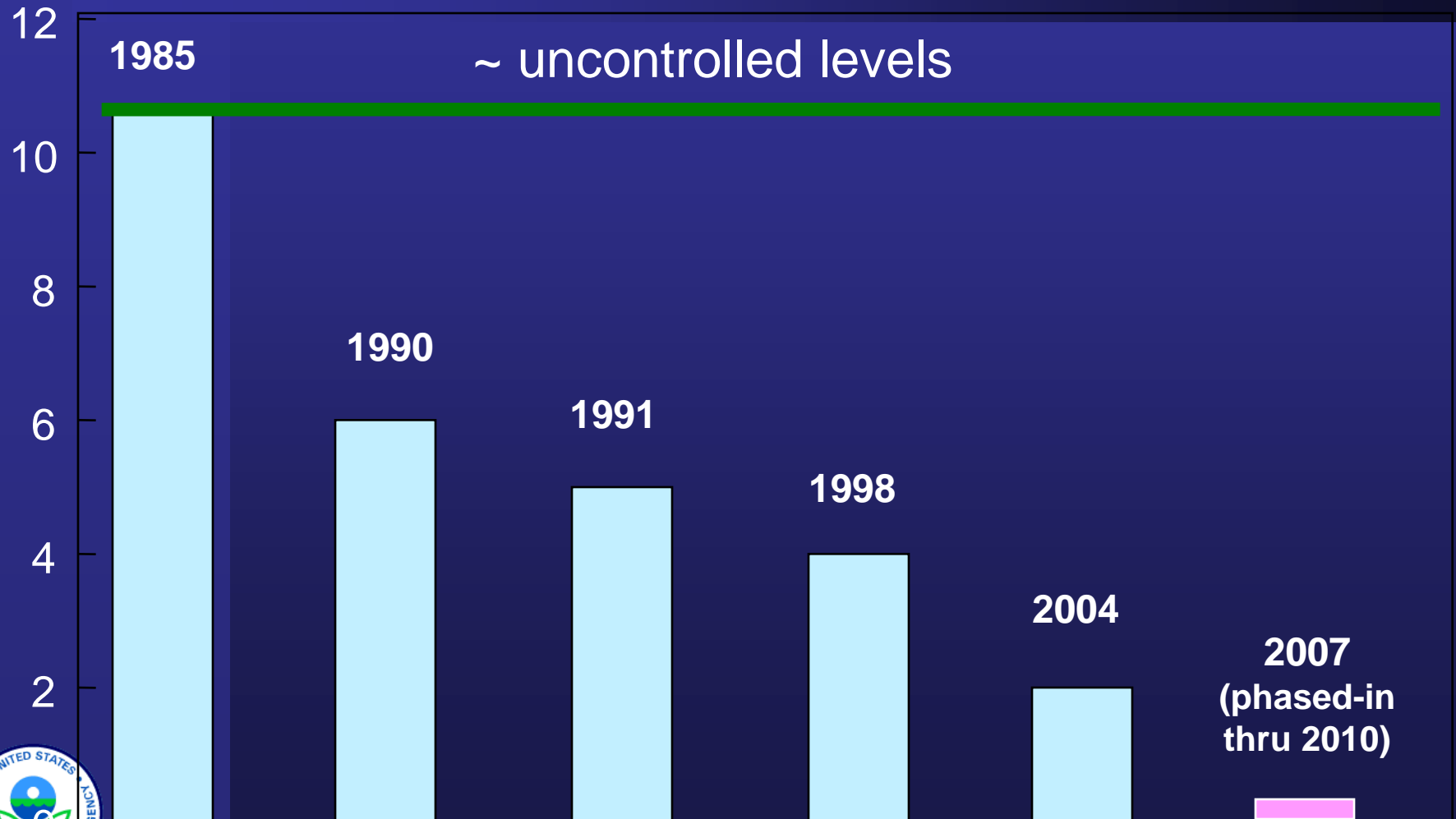
diesel particulate filters (DPF) removes

- > 90% PM
- > 90% BC

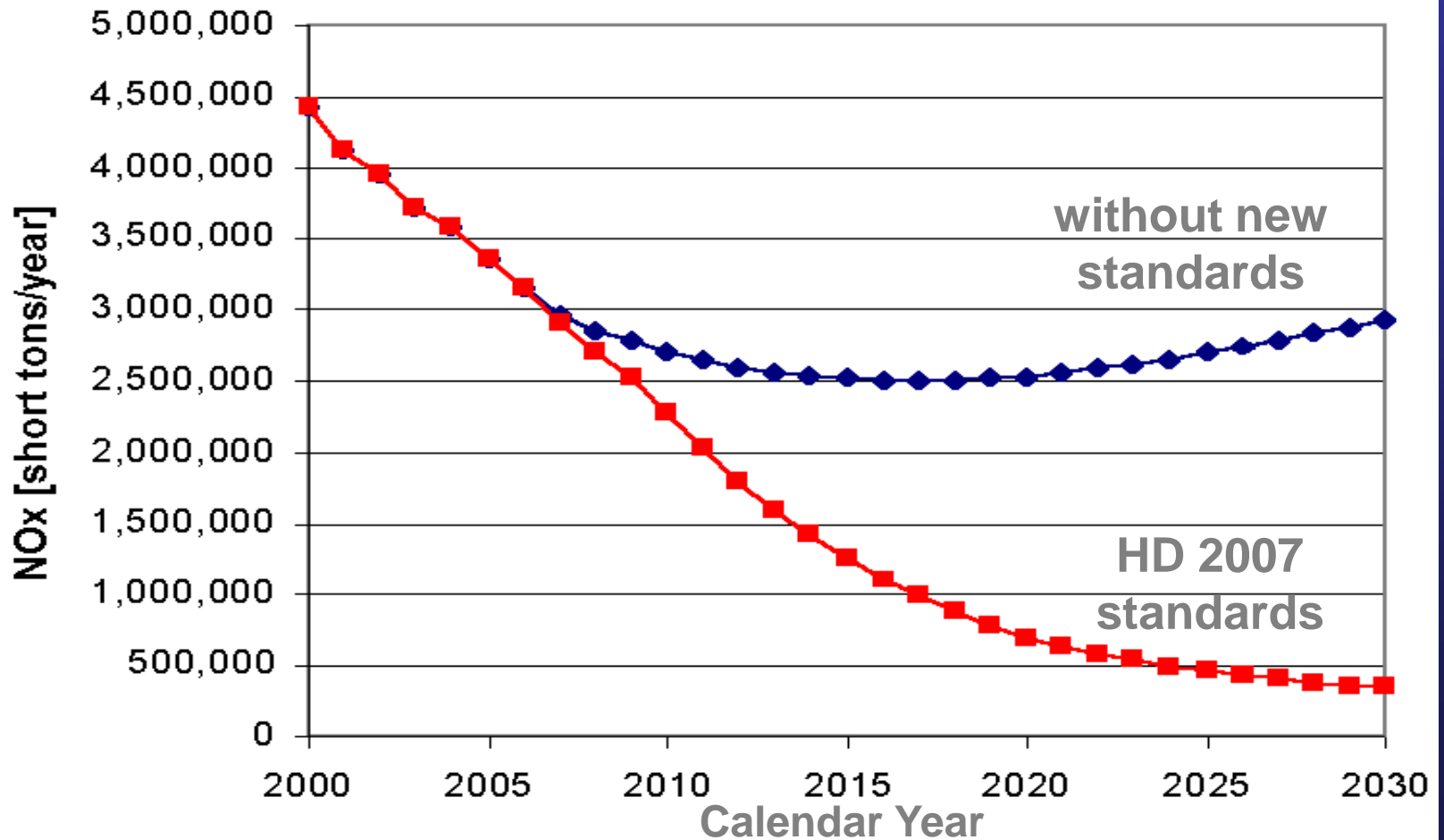


# Highway Diesel NOx Standards

grams per hp-hour

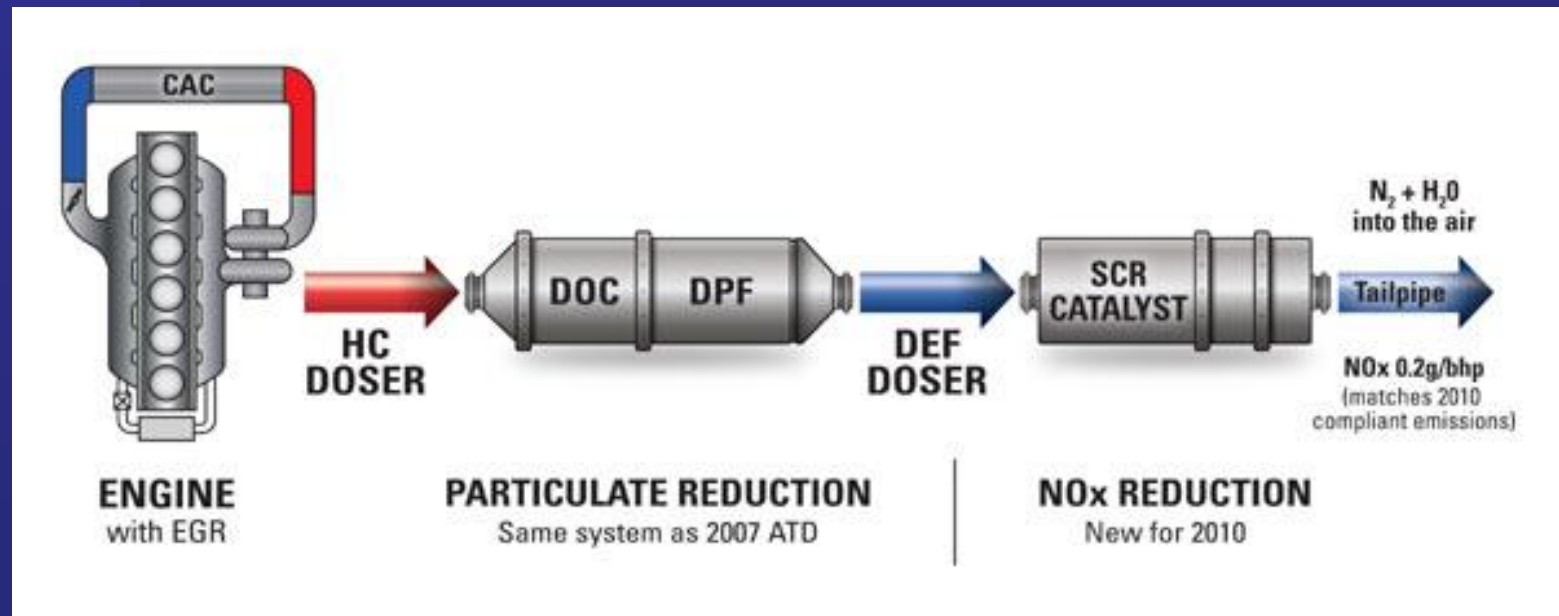


# Nationwide Heavy-Duty NOx Emissions



# 2010 PM and NOx Reductions

Majority of Engine Manufacturers will use Diesel particulate filters and SCR to meet 2010 standards



from [www.factsaboutscr.com](http://www.factsaboutscr.com)



# *What is SCR?*

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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%+)



# *Additional Considerations for SCR*

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Depends on the user to add Diesel Exhaust Fluid (DEF) when necessary.

- Driver Inducement

- Ensure that vehicles will meet the standards in use (that vehicles will not operate without quality DEF)
- Vehicle will not operate properly without DEF

- DEF Infrastructure

- Ensure that drivers will find DEF wherever they need it
- DEF infrastructure is in place



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# Biodiesel Producers and Users



# *Why Biodiesel?*

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- Reduce air pollution from vehicle exhaust
  - Particle pollution linked to asthma, lung cancer and premature death
- Decrease greenhouse gas emissions
  - Particularly when using recycled feedstock
- Recycle waste
  - Keep waste oil out of landfills
- Prevent sewer blockages
  - Avoid repair costs and fines



# *What biodiesel is – and isn't*

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Biodiesel is:

- Converted from renewable feedstock to FAME
- Biodiesel must meet ASTM standards
  - ASTM D6751-09 for pure biodiesel
- Blends in any amount can be used in diesel vehicles
  - Typically B5 or B20 is used

Biodiesel is not:

- Vegetable oil, whether virgin or recycled, that has not undergone a chemical conversion process



# *Waste Vegetable Oil (WVO)*

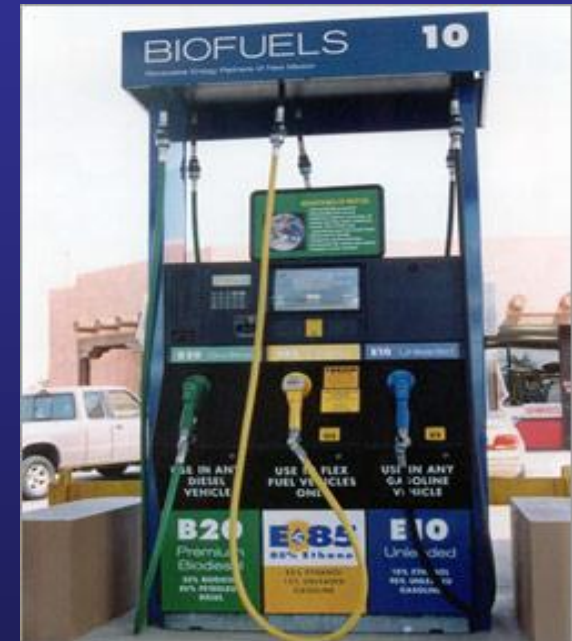
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- Registration required for new fuels
  - WVO not registered
- EPA Certification required to convert a vehicle to operate on waste oil
- Even with certification, conversions may violate vehicle warranty terms
- EPA has authority to enforce regulations



# *What can municipalities do?*

- Municipalities can purchase biodiesel from distributor
- Municipalities can collect waste vegetable oil and convert to biodiesel themselves
- Public-Private partnership to collect WVO and convert
- All can help meet sustainability goals
- Cost savings are possible



# Conclusion

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- US 2010 a big step in National Clean Diesel Campaign
- Reductions of diesel emissions are critical to address air quality problems
- Majority of engine manufacturers are using Diesel Particulate Filters (DPFs) and Selective Catalytic Reduction (SCR) to meet 2010 standards
- Biodiesel can be done right



# Resources

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- EPA's Office of Transportation and Air Quality  
[www.epa.gov/otaq/](http://www.epa.gov/otaq/)
- National Clean Diesel Campaign (NCDC)  
[www.epa.gov/cleandiesel/](http://www.epa.gov/cleandiesel/)
- NCDC Trucker Page  
[www.epa.gov/otaq/diesel/truckers.htm](http://www.epa.gov/otaq/diesel/truckers.htm)
- EPA Region 2  
[www.epa.gov/region2/](http://www.epa.gov/region2/)
- SmartWay Program  
[www.epa.gov/smartway/](http://www.epa.gov/smartway/)



# *Contact Information*

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