Metropolitan Washington Council of Governments

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DIESEL TECHNOLOGY FORUM

Membership of the Diesel Technology Forum

- AGCO
- BorgWarner
- Bosch
- Caterpillar Inc.
- CNH Industrial
- Cummins Inc
- Daimler
- Delphi Automotive
- Deere & Company
- FCA
- Ford
- General Motors
- Honeywell
- Isuzu Motors
- Johnson Matthey
- Mazda North American Operations
- MTU America
- Neste
- Umicore
- Volvo Group
- Volkswagen Group of America
- Yanmar

Allied Members

- Association of Diesel Specialists
- National Biodiesel Board
- Western States Petroleum Association

VW Emissions Crisis: Official DTF Statement *09/23/2015*

- The circumstances involving a single manufacturer do not define an entire technology, or an industry.

- Vehicle manufacturers and engine makers have invested billions of dollars in research and development to successfully meet the most aggressive emissions standards in the world. They continue to work closely and cooperatively with the Environmental Protection Agency, California Air Resources Board, international regulatory bodies as well as environmental and other interests groups toward common goals.

- Nothing has changed the fact that the diesel engine is the most energy efficient internal combustion engine. It is a proven technology and its unique combination of efficiency, power, reliability, performance, low-emissions and suitability for using renewable fuels ensures a place for diesel technology to help meet the demands of a global economy.

- We are also confident that consumers will continue to find the new generation of clean diesel cars, trucks and SUVs as a competitive choice to meet their personal transportation needs.

Diesel is the Prime Mover of Freight Over the Road

Powertrain Options for the Class 3-8 Fleet → **Consume About 25% of All Transportation Fuels**

	Diesel	Natural Gas
Nationwide	9,536,635	40,470
Maryland	128,478	323
Virginia	194,684	218
D.C.	7,880	463

Vehicles-in-Operation, 2015

Diesel is the Prime Option in Class 8 Vehicles

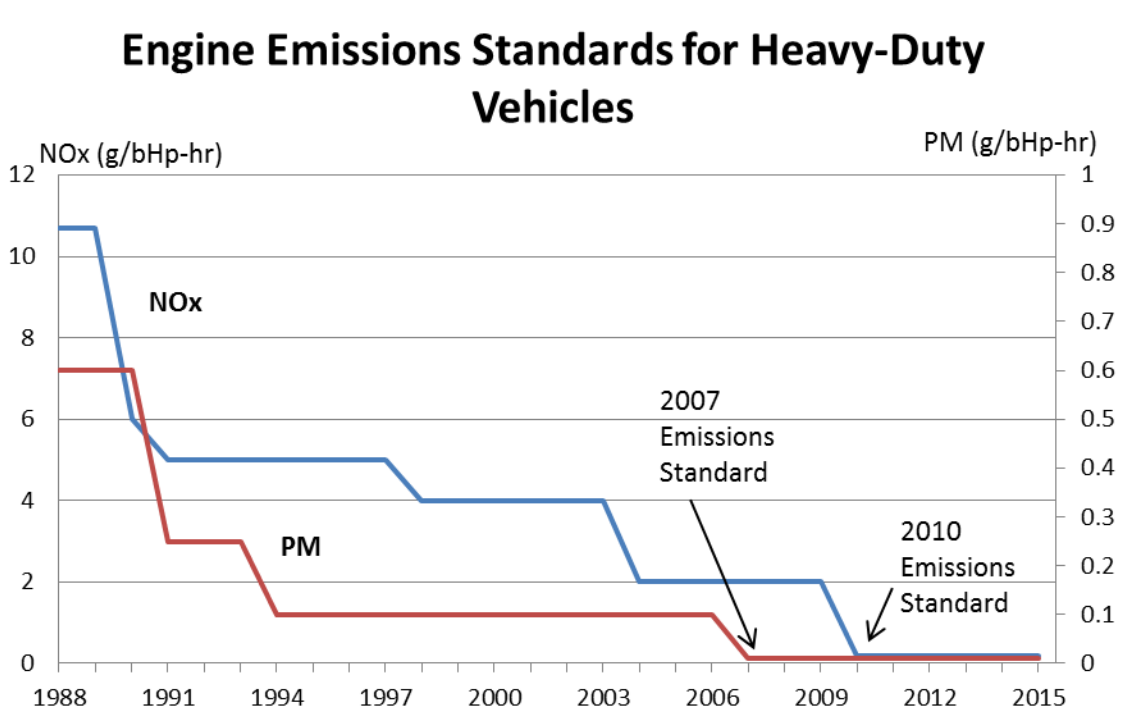
Powertrain Options for the Class 8 Fleet

Class 8s Consume 75% of Fuel of All Commercial Vehicles

	Diesel	Natural Gas
Nationwide	3,842,231	33,881
Maryland	31,396	239
Virginia	60,691	189
D.C.	2,152	459

Vehicles-in-Operation, 2015

What is a Clean Diesel Truck?



Class 3 - 8

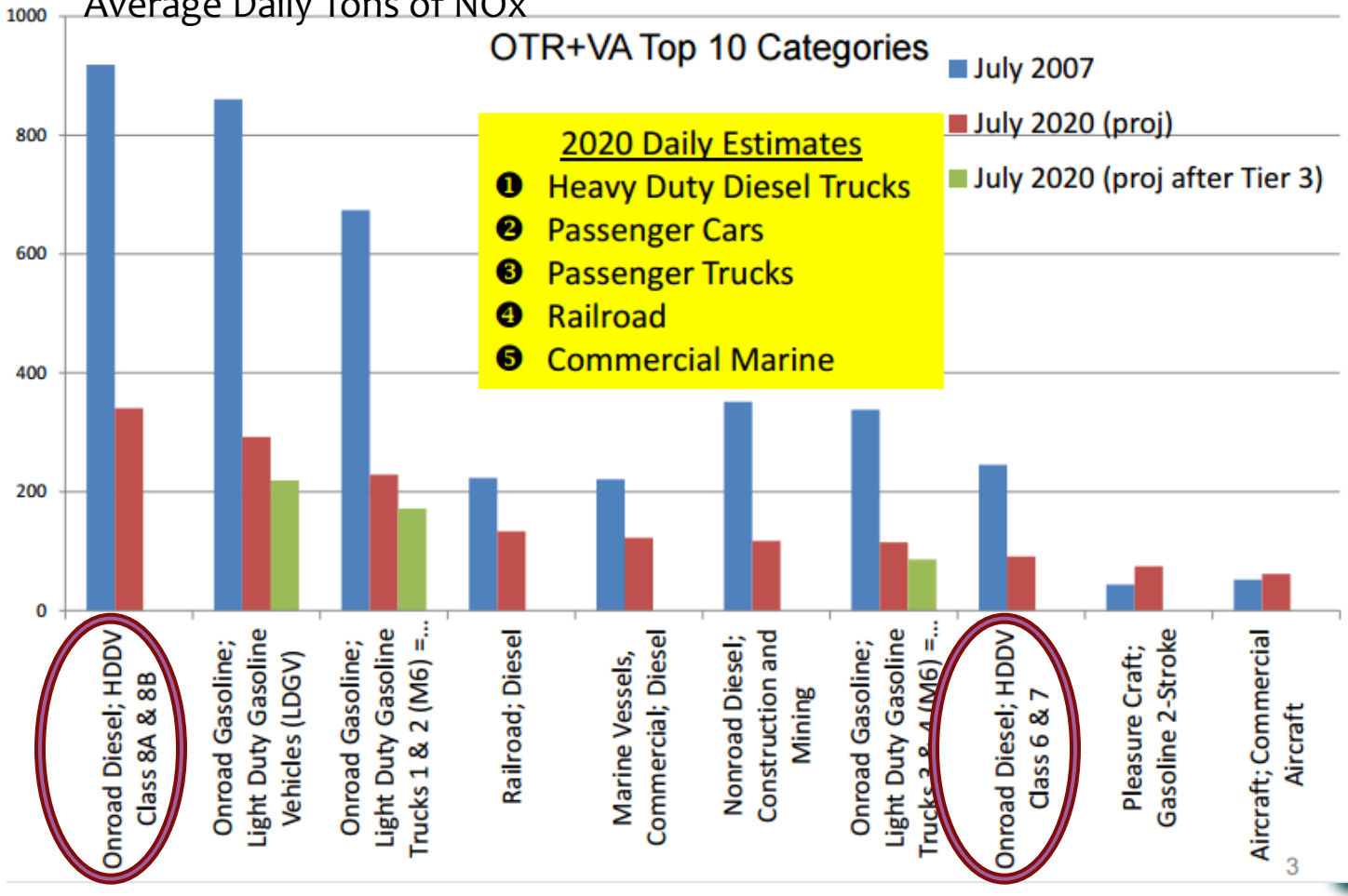
How Clean Is Clean?

MY 2010 Class 8 = **5 miles** to generate a penny's weight in NOx

MY 1988 Class 8 = **0.25 miles** to generate a penny's weight in NOx

Class 8	Annual VMT: 110-140,000	NOx (g/mi) Pre-2007: 9.19 2007-2009: 2.94 2010+: 0.50	PM (g/mi) Pre-2007: 0.233 2007-2009: 0.025 2010+: 0.025

Clean Diesel Trucks Are Important to Air Quality in the Region



SOURCE: Ozone Transport Commission

Varied Experience with Clean Diesel in the Region

State Ranking	State	Share of MY2010 in the Class 3-8 Diesel Fleet
#1	Indiana	45.6%
	National Average	25.7%
#9	**Maryland**	**28.6%**
#45	**Virginia**	**19.1%**
#48	California	18.2%
#51	**D.C.**	**14.5%**

Clean Diesel Commercial Vehicles Generate Substantial Benefits

- NATIONWIDE
  - 1-in-4 Commercial vehicles meet or beat the MY2010 Standard
  - Since 2010:
    - **Eliminated 30 million tonnes of C02**
    - **Eliminated 7.5 million tonnes of NOx**
    - **Saved 69 million barrels of oil**

NOx Emissions from removing all cars on the road for 2 years

Creating a solar farm 3X the size of Washington D.C.

Carbon Sequestration from a forest the size of Indiana

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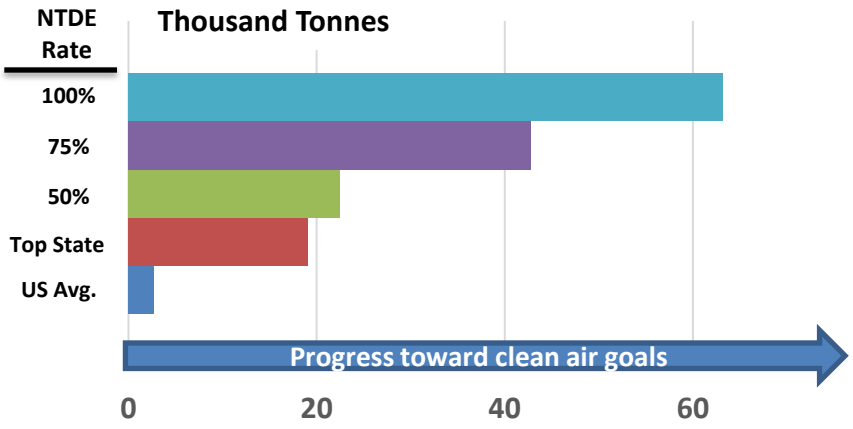
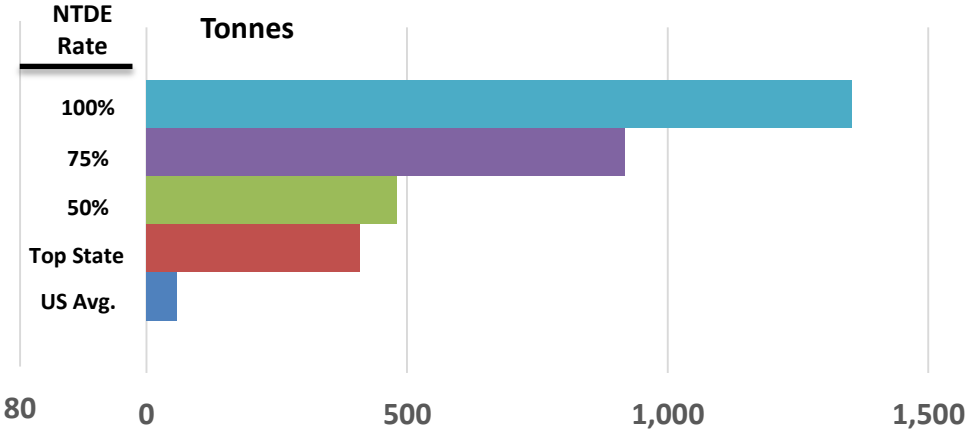
Additional benefits are coming with a greater adoption of diesel engines in New Jersey…

What if more new clean diesel trucks replaced older trucks at a faster rate?

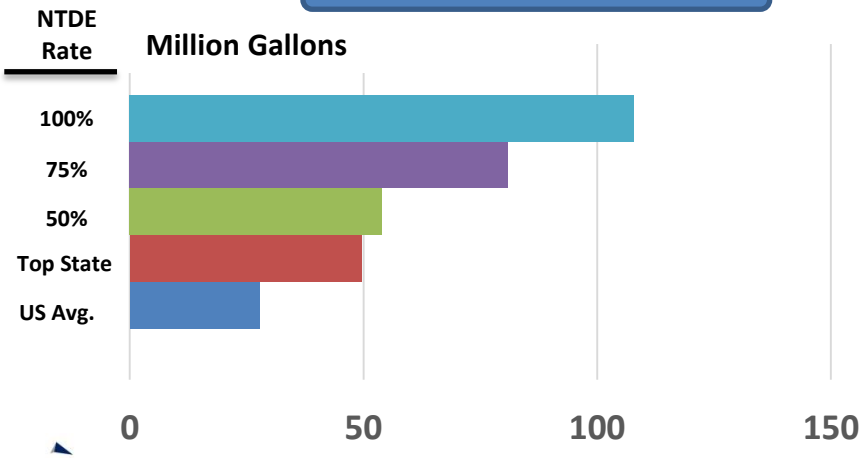
2015 NOx Reduction



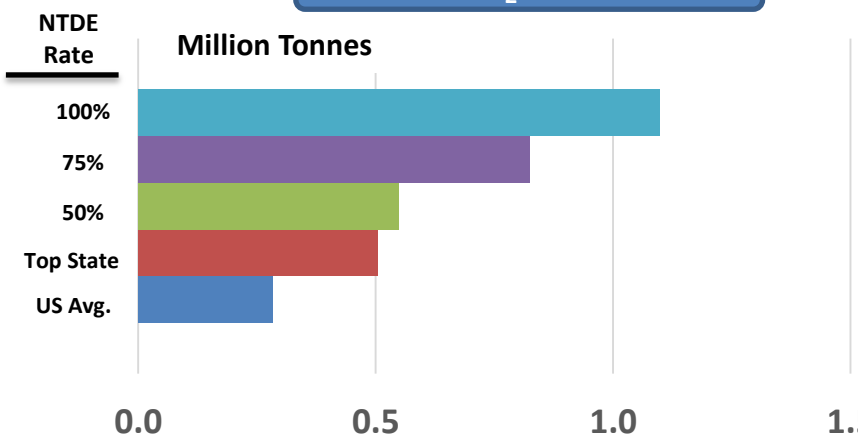
2015 PM Reduction



2015 Fuel Reduction



2015 CO_2 Reduction



Note: Top State for 2015 is Indiana

Next in the Clean Diesel Story…Off-Road Equipment Deliver Air Quality Benefits

Tier 4 Standards at work delivering clean air and fuel savings

Depending on Equipment Type and Horsepower range, Tier 4 compliant engines deliver more than a 90% reduction in NOx

Impressive Advances in "Hybridization" and Efficiency

- Productivity enhancements couple near-zero "Tier 4" emissions reduction with fuel economy benefits.
  - MPG vs Yard of Earth per Gallon?
  - Next generation drivetrain
  - Hydraulic hybrid, traditional hybrid and energy storage capabilities

Biofuels Can Enhance Clean Air Benefits of Clean Diesel

- Biofuel capability of diesel technology: Biodiesel & Renewable Diesel


Petroleum Reduction


Air Quality Benefits


Greenhouse Gas Savings

- Great potential comes with unique challenges
  - Biodiesel: Blend limits and warranty concerns
  - Renewable Diesel: Difference in cetane means changes to engine timing

- Who is making the switch? New York City, City of Oakland, City of Walnut Creek, Eugene Water and Power, Google, Disneyland, Super Bowl 50, UPS…..just to name a few

Thank You

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