Before the

United States Senate

Environment and Public Works Committee

September 24, 2008

Statement of the

Diesel Technology Forum

Allen Schaeffer, Executive Director

INTRODUCTION

Good Afternoon. My name is Allen Schaeffer and I serve as Executive Director of the Diesel Technology Forum, a not for profit educational group representing the nation's leading diesel engine, vehicle and equipment manufacturers, fuel refiners and suppliers, including those that manufacture emissions control technology. We appreciate the opportunity to appear before you today to discuss actions at the Environmental Protection Agency relative to the Clean Air Act over the last 8 years. Specifically our focus will be on diesel engines, equipment and fuels.

ADVANCING CLEAN DIESEL TECHNOLOGY

As a matter of background, because of their unique combination of power, performance and energy efficiency, diesel engines are the workhorse of the US and global economy, powering over 90 percent of commercial trucks, 100 percent of freight locomotives and marine work boats and two-thirds of all farm and construction equipment. Diesel engines are also found in back up emergency electrical generators, stationary pumps and other industrial equipment. Diesel engines also make up about 3.0 percent of all passenger vehicles, a number that has grown more than 70 percent over the last 7 years.

The last 8 years have seen actions that compel the fundamental transformation to a new generation of diesel engines, fuels, and emissions control technologies in each of those previously noted 6 categories of equipment or vehicles. We refer to this as clean diesel. By definition this is the combination of advanced new engine technology, cleaner diesel fuel, and emissions control devices all working together as a system. Clean diesel is the future – it is a system that is now or will soon be "standard equipment" for all diesel engines and equipment, including a whole new generation of clean diesel cars now coming to market.

Moving to Clean Diesel Technology has involved both conventional and non-conventional approaches by industry, the EPA and other stakeholders. In a practical sense, it means stringent

new engine emission standards, the switch to a cleaner diesel fuel, but also a new voluntary collaborative approach to reduce emissions from existing engines and equipment. For engine manufacturers, it has required substantial innovation and breakthroughs in emissions control technology, engine performance and management to meet both customer requirements as well as environmental standards. Fuel refiners have also met unprecedented requirements to reduce sulfur levels in diesel fuel.

NEW CLEAN DIESEL ENGINE EMISSIONS STANDARDS IN PLACE FOR ALL VEHICLES AND EQUIPMENT

With regard to new engines, over the last 8 years, the EPA has enacted the most stringent emissions standards on the diesel industry in history, requiring more than a 90 percent reduction in emissions of particulate matter and nitrogen oxides from previous levels. This effort began in 2000 with rules adopted by the Clinton Administration, which were subsequently defended, implemented and expanded to other equipment sectors by President Bush and the current administration. As a result of the EPA's numerous regulatory actions, the pathway to cleaner diesel engines and fuels to achieve much lower emissions is now in place for everything from small construction equipment, farm machinery, highway commercial tractor trailer trucks, freight locomotives, marine vessels, work boats and very large off-road machines and mining equipment. And most recently, to a new generation of clean diesel passenger cars that meet the emissions standards of all 50 states. A graphical representation of the continuous improvement in diesel engines is provided as an Appendix to this testimony.

A foundation of this success story is the switch to ultra low sulfur diesel fuel (ULSD) (enacted as part of the 2007 and 2010 highway engine rule which was finalized in early 2001) which required most highway grade diesel fuel to have 97 percent lower levels of sulfur by mid-2006, and all highway fuel to be so by the end of 2010. Cleaner diesel fuel that is lower in sulfur is critical in that it enables the use of advanced emissions control systems to help reach very low emissions levels. Simply using cleaner diesel fuel in any existing engine can reduce particulate emissions by as much as 10 percent.

The last time a major change to diesel fuel formulation took place was in 1993 and resulted in spot supply shortages and vehicle performance problems for the first 6 months of the fuel transition. Older truck engines were particularly affected in California. Enforcement waivers had to be granted and the switch was viewed as problematic on a number of fronts.

This time around, the EPA took a number of steps to assure a smoother transition. In 2001, EPA convened an independent advisory panel of all stakeholders including fuel and engine experts and end users to provide input and a sounding board for issues regarding the transition and the ability to produce and distribute the new cleaner fuel, known as ultra-low sulfur diesel fuel. Beyond this group, the EPA played an active role in the Clean Diesel Fuel Alliance—(www.clean-diesel.org) involving DOE, oil and engine manufacturers and other stakeholders to provide compliance information to end users, fuel distributors and marketers.

While not perfect, the October 15, 2006 roll-out of clean diesel fuel was a marked improvement over 1993. EPA mostly succeeded in meeting the goal of a smoother transition to the new cleaner fuel that was transparent, had widespread fuel availability to match the new 2007 model year highway trucks and clean diesel cars which required the use of the ULSD. Work continues

today toward assuring consistent nationwide supply of ULSD and meeting the final 100 percent availability requirement by December 31, 2010.

The use of ultra low sulfur diesel fuel is now being phased in for most off-road machines and equipment by 2010, and ultimately to all off-road engines and equipment, including locomotives and marine boats by 2014.

As a result of this progress, many stakeholders have come together to applaud the contribution of ULSD and clean diesel technology to clean air progress around the country. Our group partnered with the Natural Resources Defense Council in a joint press conference heralding the switch to new clean diesel fuel in October 2006.

The EPA has also closely collaborated with California on the adoption of many diesel emissions and fuel quality standards, and has been helpful in raising awareness about the fuel savings, federal tax credits, and greenhouse gas emissions benefits from a new generation of clean diesel cars, highlighting their fuel savings of 20-40 percent over a gasoline vehicle with 10-20 percent lower emissions of CO2.

NON-CONVENTIONAL APPROACHES: CLEAN DIESEL RETROFIT and SMARTWAY TRANSPORT PARTNERSHIP

While the administration has implemented a substantial number of regulations that impact new engines and equipment, it has also worked to reduce diesel emissions and improve air quality by pursuing non-conventional, non-regulatory approaches outside the normal regulation of new engines and fuels.

Because diesel engines are renowned for their durability and long-lives, in 2000, the EPA announced the creation of a new voluntary program called the “Diesel Retrofit Initiative.” Through this effort, EPA hoped state and local governments, fleet operators and industry could complement the reductions coming from regulatory actions by using newly available technology on their existing heavy-duty trucks, buses and construction equipment. A goal was set to reduce emissions from more than 11 million diesel engines.

In 2003, EPA created Clean School Bus USA to provide a targeted focus on this sector with $5 million in congressional appropriations that year. By May 2004, more than 160,000 diesel engines had been retrofitted through EPA’s voluntary Diesel Retrofit Initiative, leading to several other sector specific initiatives focusing on ports, construction, agriculture and the freight industry.

One of the key reasons for EPA’s success in promoting voluntary retrofit projects was the creation of regional diesel collaboratives. By inviting industry and environmental groups, as well as state and local governments to focus on projects and concerns of regional interest, EPA was able to bring energy and attention to this critical issue and offer federal support while letting local stakeholders have ownership and flexibility to set their own priorities.

Today, engine and equipment manufacturers, fuel providers and emissions control technology companies continue to work side by side to increase the number of clean diesel retrofitted vehicles across the country. However, key to the success of this national Clean Diesel effort is funding for end users like school districts, refuse haulers, contractors and trucking fleets to acquire and install these new emissions control technologies.

Here, Congress and this Committee in particular, continue to play a vital role.

Senators Carper and Voinovich in 2005 undertook a bipartisan effort to help advance clean diesel retrofit through the Diesel Emissions Reduction Act, a portion of the 2005 Energy Bill which was supported by members of this Committee. DERA provides funding for the voluntary diesel retrofits and is authorized up to $200 million annually for 5 years, with 30 percent going to the states directly, and 70 percent to EPA to allocate to national projects across the country.

The authorization of $1 billion over 5 years boosted the hope of program stakeholders around the country that their voluntary efforts could bring measurable air quality improvements. Moreover, the program's structure, by dedicating funds to support the creation of state programs and the development of emerging technologies further energized local stakeholders who had differing views and solutions for addressing this common national issue.

Thanks to the appropriation of $49.2 million for DERA in FY08, the fruits of these early efforts are now growing exponentially. Of the $49.2 million in FY08, $27.6 million was available for the national grant competition run through EPA's regional diesel collaboratives. This solicitation generated over 236 applications requesting approximately $144 million in retrofit funding support. In addition, the state grant program generated interest from all 50 states, with 35 providing their own matching funds, thereby fostering the creation of voluntary retrofit funding programs in every state, ranging in size from approximately $200 million to $500 million. Each state has chosen its own sector priorities and distribution methods which is likely to engender continued support in the years ahead.

Virtually the only criticism we've heard of the program, besides the desire for full funding, has been around the coordination between EPA and California's Air Resources Board on the verification of new retrofit technologies and the inordinate time required to receive new verifications. Hopefully DERA's funding for emerging technologies will help bring attention to this issue and more solutions to market.

Finally, EPA has an equally successful voluntary-based program in the SmartWay Transport Partnership, which has worked with the freight sector to reduce emissions and save energy through a voluntary public private initiative to accelerate the adoption of money-saving market based approaches such as idle reduction technologies, fuel saving aerodynamic devices, combined with the use of new emissions control technology. This program is well-regarded and growing with over 1000 partners and affiliates.

CONCLUSION

The transformation to clean diesel technology is well at hand, and by any measure, is a success story, with industry, environmental stakeholders and EPA working together.

- Manufacturers are delivering on the challenge through the production and delivery of clean diesel commercial trucks since 2007.

- Refiners have delivered cleaner diesel fuel and continue to expand its availability.

- End users that have acquired the new technology are finding it to meet or exceed their expectations with performance, fuel economy and low emissions.

- Every category of stationary and mobile diesel engines – with the exception of ocean going container vessels – is now on a path to cleaner diesel fuel and low emissions diesel engine technology.

- There is genuine excitement about the new generation of clean diesel cars and light trucks that are now 50-state emissions certified and provide consumers with another green choice that has 10-20 percent fewer CO2 emissions and 20-40 percent better fuel efficiency compared with gasoline. The ability to use renewable fuels only adds to the importance and opportunity of this new technology.

The voluntary, incentive- based programs that EPA has championed through its National Clean Diesel Campaign and SmartWay Transport partnership will play an even greater role in reducing emissions and saving energy in the future.

Congress has played an important role in authorizing and appropriating funds for these voluntary incentive based programs, and consumer tax credits for light duty advanced lean-burn diesel vehicles. Your continued support in this area is needed.

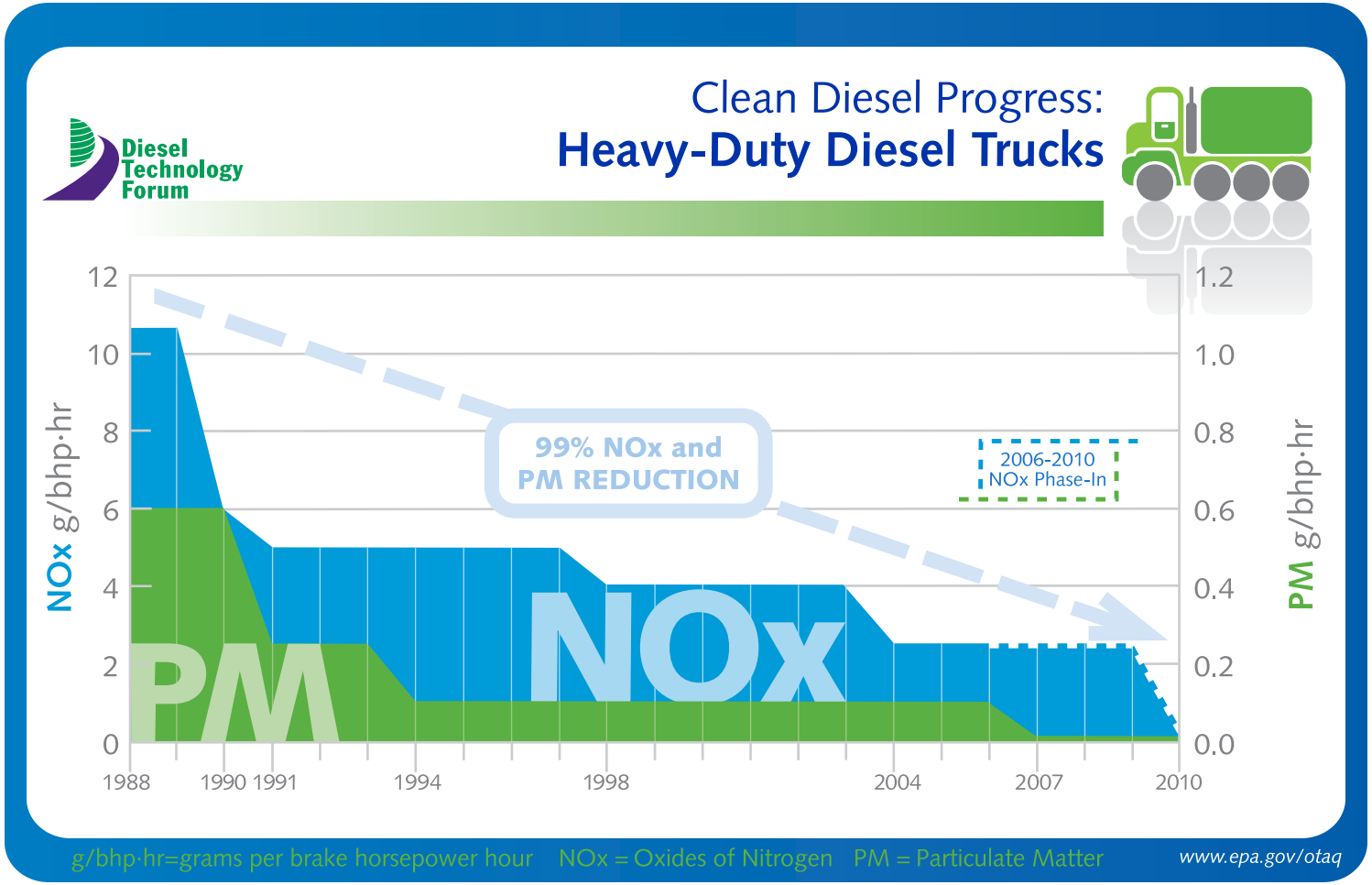
Thank you for the opportunity to appear today and I would be happy to answer any questions.

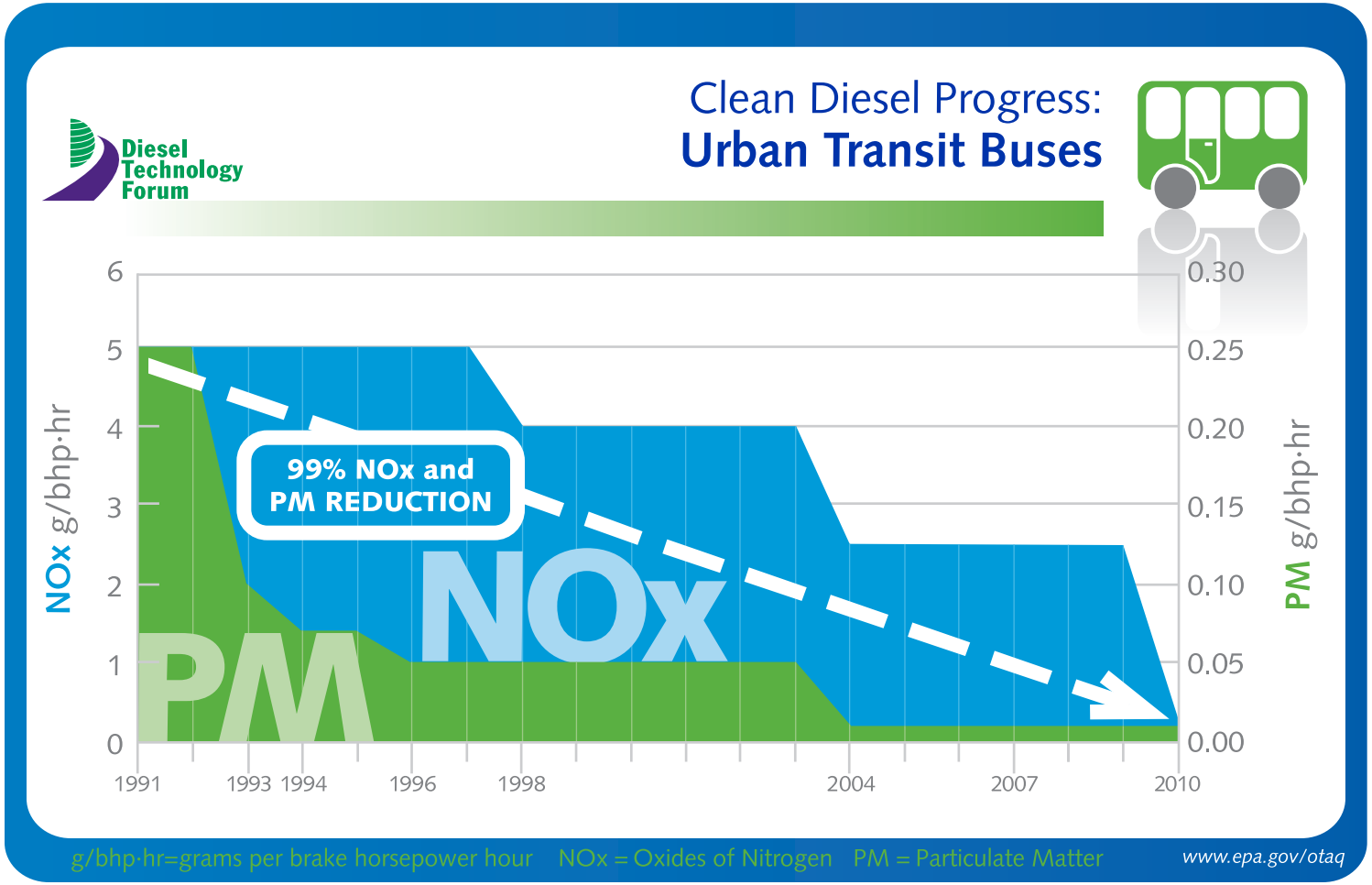
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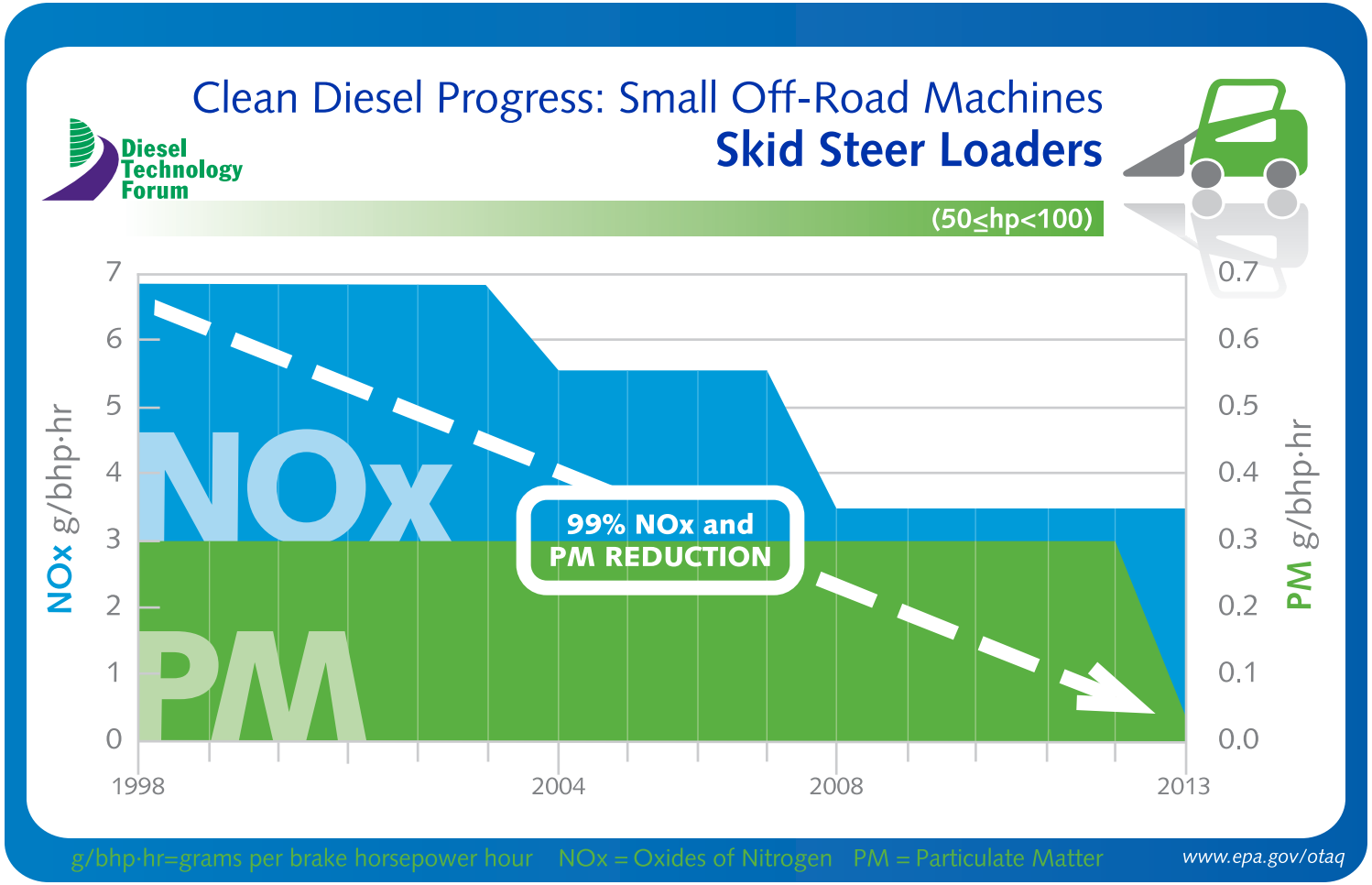
Membership of the Diesel Technology Forum

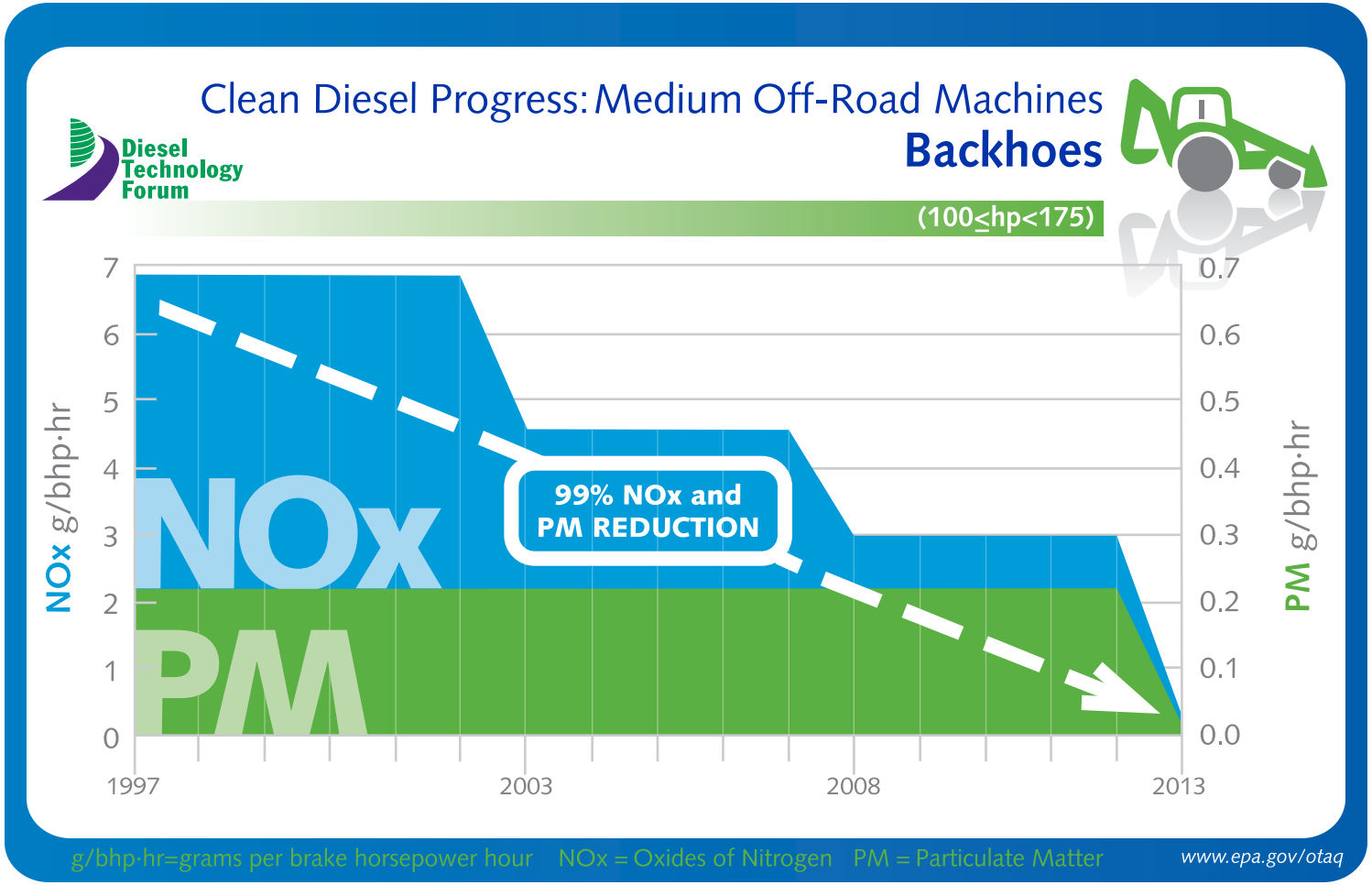
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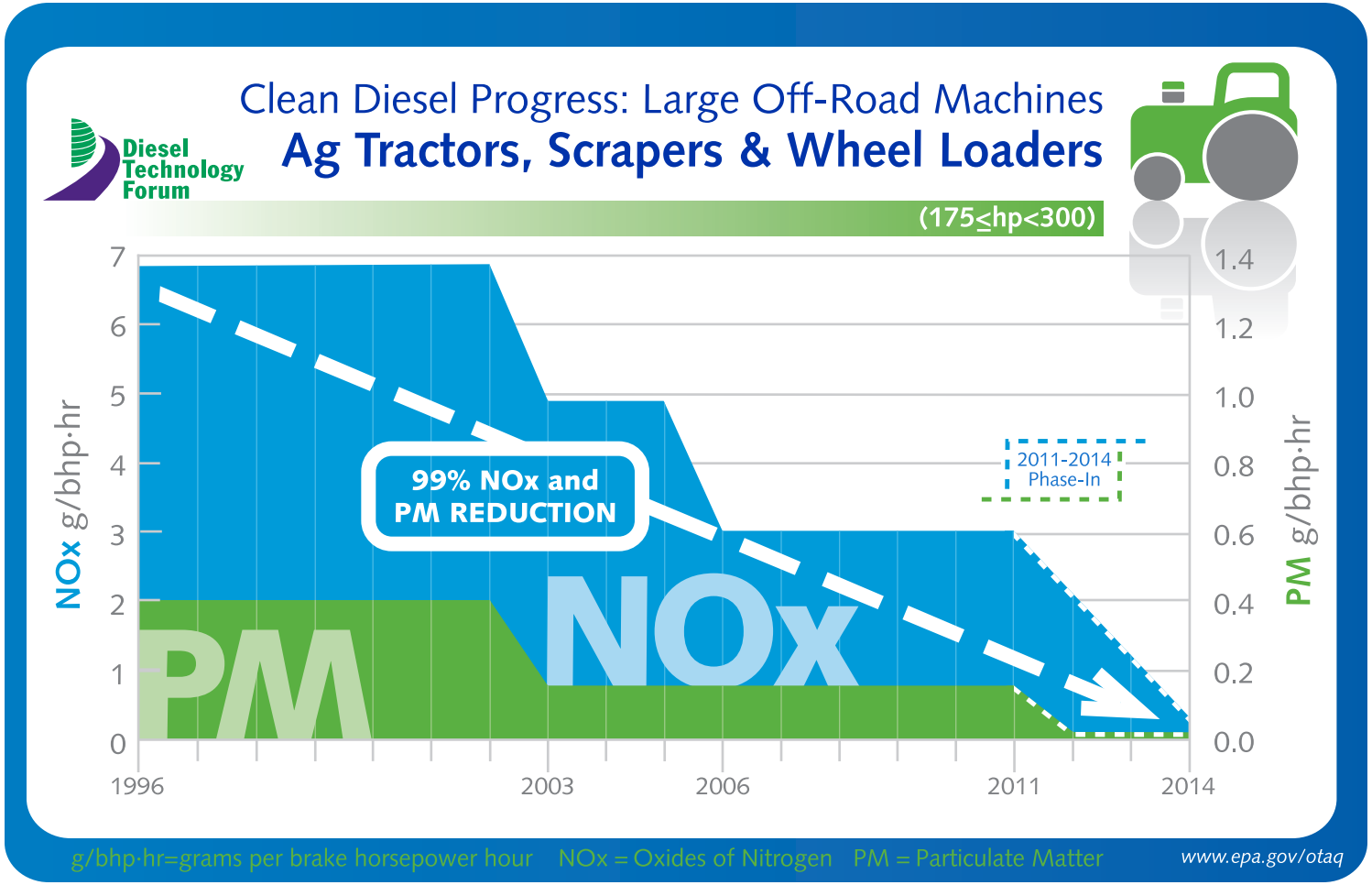
Association of Diesel Specialists
BASF Catalysts
BMW
BorgWarner
Bosch
BP
Chevron
Corning
Caterpillar
Cummins
Daimler
Deere & Company
Delphi
Denso
Detroit Diesel
Donaldson
Eaton
Ford
General Motors
Honeywell
Johnson Matthey
LE Jones
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Navistar
Neste Oil
Sturman Industries
Umicore Autocat USA Inc
Volkswagen
Volvo Powertrain
Western States Petroleum Association

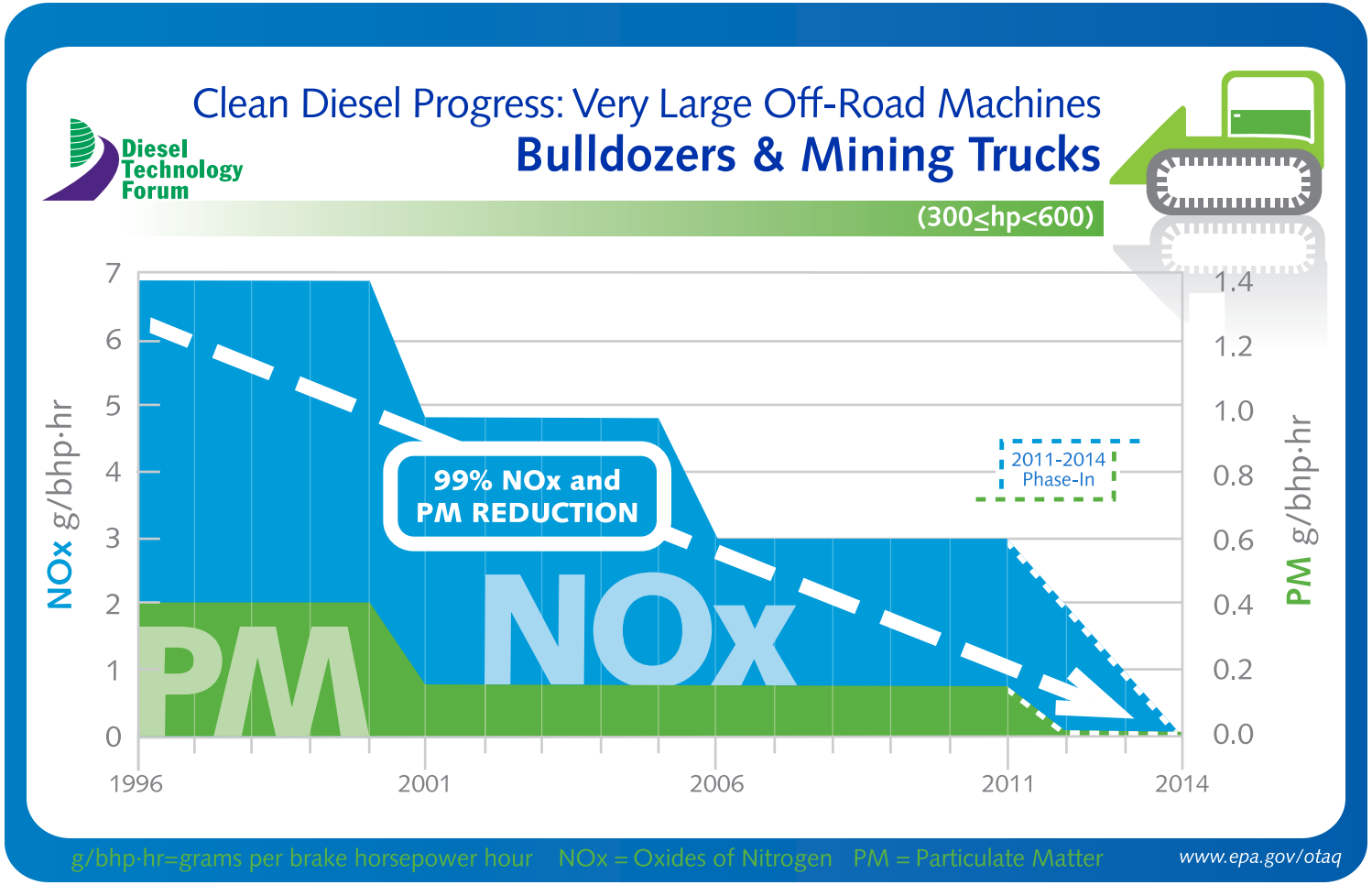

Diesel Technology Forum
Clean Diesel Progress:
Heavy-Duty Diesel Trucks
NOx g/bhp·hr
PM g/bhp·hr
12
10
8
6
4
2
0
1.2
1.0
0.8
0.6
0.4
0.2
0.0
99% NOx and PM REDUCTION
2006-2010 NOx Phase-In
PM
NOx
1988
1990 1991
1994
1998
2004
2007
2010
g/bhp·hr=grams per brake horsepower hour
NOx = Oxides of Nitrogen
PM = Particulate Matter
www.epa.gov/otaq

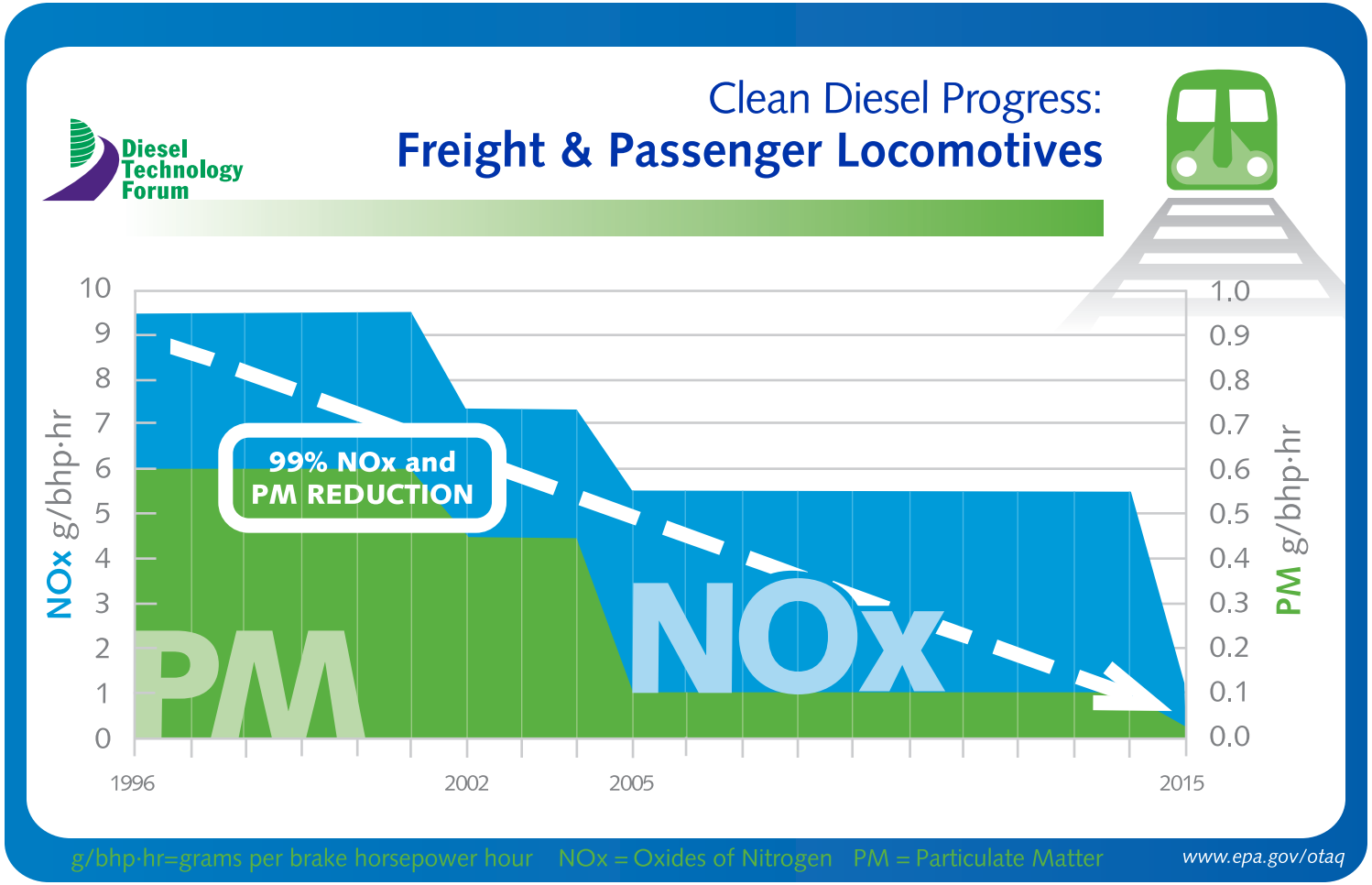

Diesel Technology Forum
Clean Diesel Progress:
Urban Transit Buses
99% NOx and PM REDUCTION
NOx
PM
NOx g/bhp·hr
PM g/bhp·hr
6
5
4
3
2
1
0
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1991
1993
1994
1996
1998
2004
2007
2010
g/bhp·hr=grams per brake horsepower hour
NOx = Oxides of Nitrogen
PM = Particulate Matter
www.epa.gov/otaq

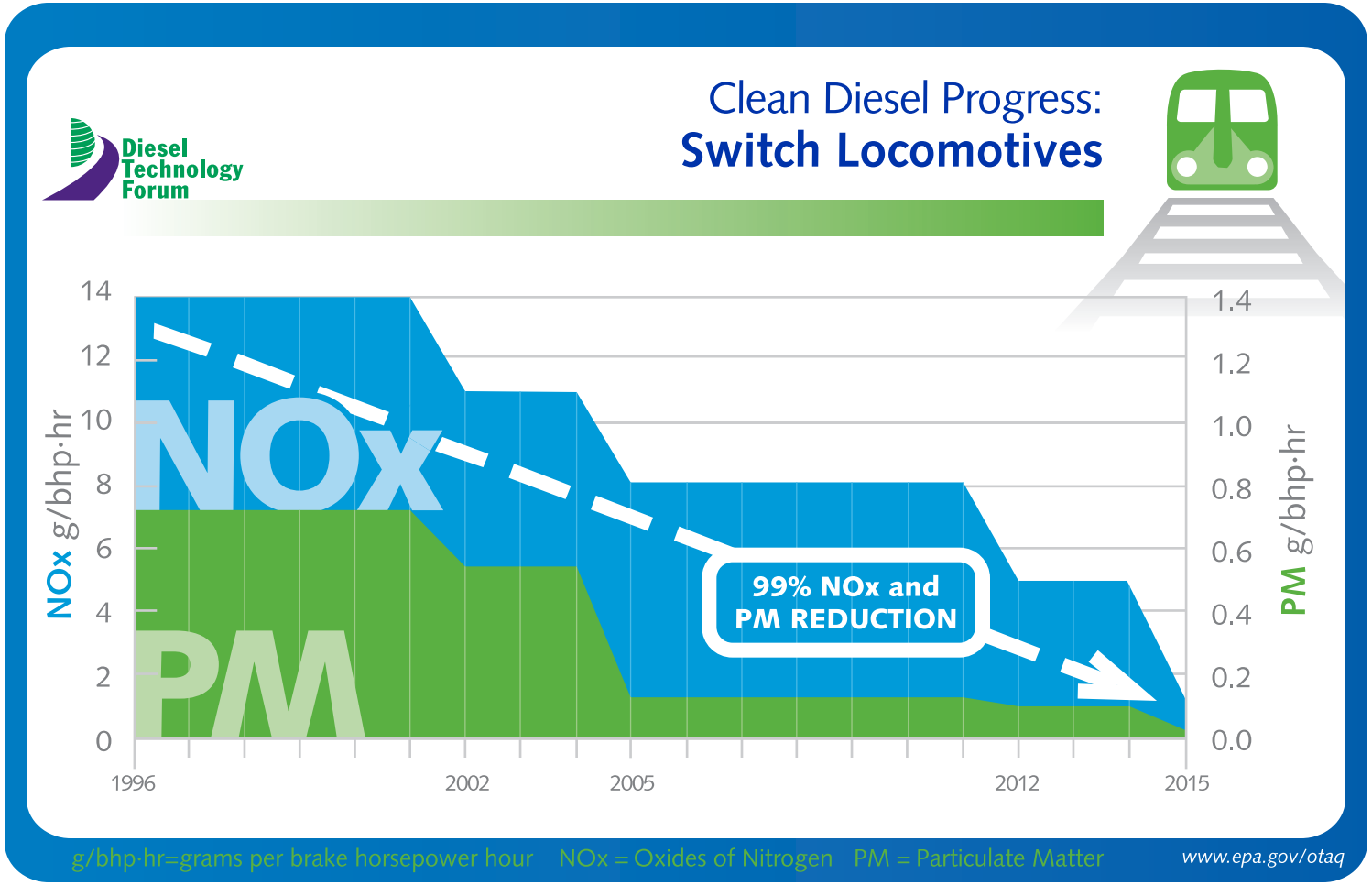

Clean Diesel Progress: Small Off-Road Machines
Skid Steer Loaders
Diesel Technology Forum
(50≤hp<100)
NOx
PM
99% NOx and PM REDUCTION
NOx g/bhp·hr
PM g/bhp·hr
0
1
2
3
4
5
6
7
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
1998
2004
2008
2013
g/bhp·hr=grams per brake horsepower hour
NOx = Oxides of Nitrogen
PM = Particulate Matter
www.epa.gov/otaq


Clean Diesel Progress: Medium Off-Road Machines
Backhoes
Diesel Technology Forum
(100≤hp<175)
NOx g/bhp·hr
PM g/bhp·hr
7
6
5
4
3
2
1
0
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1997
2003
2008
2013
NOx
PM
99% NOx and PM REDUCTION
g/bhp·hr=grams per brake horsepower hour
NOx = Oxides of Nitrogen
PM = Particulate Matter
www.epa.gov/otaq


Clean Diesel Progress: Large Off-Road Machines
Ag Tractors, Scrapers & Wheel Loaders
Diesel Technology Forum
(175≤hp<300)
NOx g/bhp·hr
PM g/bhp·hr
7
6
5
4
3
2
1
0
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1996
2003
2006
2011
2014
99% NOx and PM REDUCTION
2011-2014 Phase-In
PM
NOx
g/bhp·hr=grams per brake horsepower hour
NOx = Oxides of Nitrogen
PM = Particulate Matter
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Clean Diesel Progress: Very Large Off-Road Machines
Bulldozers & Mining Trucks
Diesel Technology Forum
(300≤hp<600)
NOx g/bhp·hr
PM g/bhp·hr
7
6
5
4
3
2
1
0
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1996
2001
2006
2011
2014
99% NOx and PM REDUCTION
2011-2014 Phase-In
PM
NOx
g/bhp·hr=grams per brake horsepower hour
NOx = Oxides of Nitrogen
PM = Particulate Matter
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Clean Diesel Progress:
Freight & Passenger Locomotives
99% NOx and PM REDUCTION
PM
NOx
NOx g/bhp·hr
PM g/bhp·hr
10
9
8
7
6
5
4
3
2
1
0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1996
2002
2005
2015
g/bhp·hr=grams per brake horsepower hour NOx = Oxides of Nitrogen PM = Particulate Matter
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Diesel Technology Forum
Clean Diesel Progress:
Switch Locomotives
NOx
PM
99% NOx and PM REDUCTION
NOx g/bhp·hr
PM g/bhp·hr
14
12
10
8
6
4
2
0
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1996
2002
2005
2012
2015
g/bhp·hr=grams per brake horsepower hour
NOx = Oxides of Nitrogen
PM = Particulate Matter
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