VW Environmental Mitigation Trust: Maximizing Emission Reduction Benefits for California

MAY 18, 2017
Welcome!

- Today’s webinar is being recorded for later viewing reference.
- A link to the presentation will be provided to everyone after today's session via email.
- You can ask questions at any time via the online Q&A feature. We will allow for at least a 20 minute Q&A at the end. Or you can contact us at any time after the session.
- We appreciate your feedback. Please help us by taking a 3 minute survey at the end.
- Thank you for attending!
Calendar of Upcoming Events

- Making the Most of the VW Settlement: More Clean Air for the Dollar
  - June 7, 2017 11:00 am ET – New York
  - June 7, 2017 2:00 pm ET – Florida
  - June 8, 2017 11:00 am ET – Pennsylvania
  - June 8, 2017 2:00 pm ET – Texas
  - June 16, 2017 11:00 am ET - Ohio

- Mid July (Date: TBA) – Cost Effectiveness of Big Engine Replacements and How to Pursue Opportunities
Today’s Speakers

Allen Schaeffer
Executive Director

About the Forum
Non-profit association representing diesel engine and equipment manufacturers, suppliers, fuel refiners and others involved in diesel engines or fuels.
For more information please visit us at www.dieselforum.org

Ezra Finkin
Director of Policy & External Affairs
MEET THE LEADERS IN ADVANCED CLEAN DIESEL

The members of the Diesel Technology Forum are leaders of the diesel industry including engine and equipment makers, key component manufacturers, fuel producers and emissions control technology manufacturers.

WWW.DIESELFORUM.ORG
Provide a brief overview of the VW Environmental Mitigation Trust and its process and help answer some important questions:

- What are the categories of eligible projects?
- What are the largest sources of NOx emissions in the region?
- What is the make up of commercial vehicles on the road in the region? Of these, which are eligible for funding?
- What are the benefits of upgrading larger equipment?
- What are cost effective investment strategies to make the most of Trust revenues?
- What communities will benefit the most?
Focus of Our Webinar Today:
Opportunity for $2.9 Billion to Mitigate NOx Emissions through Upgrading Heavy-Duty Vehicles & Equipment

Breakdown of the Components of the $14.9 Billion VW Settlement

- $10 Billion - Vehicle Buyback/Lease Termination (Appendix A & B)
- $2.9 Billion - Environmental Mitigation Trust (Appendix D)
- $2.0 Billion - Zero Emission Passenger Vehicle Commitment (Appendix C)

Environmental Mitigation Trust In Perspective

$2.9 Billion to be spent in as little as 3 years for the sole purpose of NOx reduction

Total DERA Funding 2008-2013: $520 Million

- 73,000 engines, vehicles & equipment
- 335,200 tons of NOx reduced
The Process: Getting to the “Trust Effective Date” is the First Milestone

Appendix D: How the Trust Effective Date (TED) is Established

- Prospective beneficiaries recommend trustee candidates
  Deadline: November 25, 2016

- US confers with prospective beneficiaries to finalize trustee candidates list

- Trustee requests changes, if any, to the Mitigation Trust Agreement

- The US will confer with the Trustee, California, the states and settling defendant to finalize the Mitigation Trust Agreement

- Court selects a Trustee

- Mitigation Trust Agreement is finalized

- Settling Defendant & Trustee sign the Mitigation Trust Agreement

- US files the Mitigation Trust Agreement with the Court

The TED is the date the US files the executed Trust Agreement with the Court (as early as the first quarter of 2017)

First Major Milestone: Trust Effective Date
Applications For Funding Can Flow After the “TED”

- **60** days after the TED, States must notify the Trustee of their intention to be listed as a beneficiary and announce a lead agency to manage applications sent to the Trustee.

- **120** days after the TED, the Trustee will publish the list of beneficiary states.

- **90** days after being listed as a beneficiary, states must submit to the Trustee a plan that outlines how the state intends to spend Trust revenue. (7 months from TED)

**TED Assumptions**

(A) May 2017: Funding Plans Submitted by December 2017

(B) June 2017: Funding Plans Submitted by January 2018

**Trustee Requirements**

Maintain a public website listing projects funded, terms of the award and anticipated NOx reduction.
Appendix D Represents a Historic Funding Opportunity to Reduce NOx Emissions

- **Environmental Mitigation Trust**
  - $423 Million
  - *Additional revenue through separate settlements*

- **DERA Funding (2008 – 2013)**
  - $72 Million for California

- **Carl Moyer Program (1998 - 2016)**
  - $900 Million to replace or repower 50,000 engines
Framework for Decision-making

HOW TO SPEND THE FUNDS?
PROJECT SELECTION
Framework for Environmental Mitigation Trust Fund Decision-making

- Identify the largest sources of NOx emissions
- Identify the most cost-effective opportunity to reduce NOx emissions
- Identify the opportunities that are available now and yield the near-term NOx reduction benefits
- Identify the geographical locations of those sources of NOx emissions

Excess NOx emissions were generated by VW non-compliant vehicles.

The EMT is for mitigating those NOx emissions.

Maximize NOx Emissions Reductions

Now

More Clean Air for the Dollar

Collateral Benefits in Fuel Savings and CO2
Heavy-Duty Vehicles & Equipment are the Largest Sources of NOx Emissions and Trucks, Equipment, Locomotives and Marine Make Up the Heavy-Duty Category

<table>
<thead>
<tr>
<th>Sources of NOx Emissions (2012)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stationary</td>
<td>13.5%</td>
</tr>
<tr>
<td>Areawide</td>
<td>3.6%</td>
</tr>
<tr>
<td>Mobile Sources</td>
<td>83.0%</td>
</tr>
</tbody>
</table>

*Trucks, Buses, Trains, Vessels and Equipment* 69.1%

*Passenger Cars* 11.3%

*Aircraft* 2.6%

**SOURCE:** California Air Resources Board, Almanac Emission Projection Data (2012)

### Heavy Duty Sources Of NOx (2012)

- **Trucks**: 47%
- **Buses**: 4%
- **Trains**: 7%
- **Aircraft**: 4%
- **OGVs**: 14%
- **Commercial Marine**: 4%
- **Construction and Farm Equipment**: 18%
- **Other**: 2%

**SOURCE:** California Air Resources Board, Almanac Emission Projection Data (2012)
Eligibility

WHAT CATEGORIES OF VEHICLES AND EQUIPMENT ARE ELIGIBLE FOR NOX MITIGATION FUNDING?
Categories of On-Road Vehicles Eligible for Funding

- **Class 8 Local Freight Trucks**
  - Non-Government Owned
    - Diesel, CNG, Hybrid Repower: Up to 40%
    - Diesel, CNG, Hybrid Repurchase: Up to 25%
    - All-electric repower or repurchase: up to 75%
  - Government Owned: 100%

- **Dray Trucks**
  - Non-Government Owned
    - Diesel, CNG, Hybrid Repower: Up to 40%
    - Diesel, CNG, Hybrid Repurchase: Up to 50%
    - All-electric repower or repurchase: up to 75%
  - Government Owned: 100%

- **Class 4-8 Buses (school, transit or shuttle)**
  - Non-Government Owned
    - Diesel, CNG, Hybrid Repower: Up to 40%
    - Diesel, CNG, Hybrid Repurchase: Up to 25%
    - All-electric repower or repurchase: up to 75%
  - Government Owned: 100%
Off-Road Equipment and Technologies Eligible for Funding

- **Freight Switchers (Pre Tier 4)**
  - Non-Government Owned
    - Diesel, CNG, Hybrid Repower: Up to 40%
    - Diesel, CNG, Hybrid Repurchase: Up to 25%
    - All-electric: up to 75%
  - Government Owned: 100%

- **Ferries/Tugs Repower (Tier 0 to Tier 2)**
  - Non-Government Owned
    - Diesel, CNG, Hybrid: Up to 40%
    - All-electric: Up to 40%
  - Government Owned: 100%

- **Airport Ground Support**
  - All-electric

- **Forklifts**
  - All-Electric

- **The DERA Option**
  - Funds may be used for *Non-Federal Match*
  - Designed to capture the wide variety of off-road equipment that would be too large to list in the consent decree
The DERA Option: Expands list of eligible projects and opportunities for greater reductions

Figure 1: DERA Option: Trust Funds as Voluntary Match to Receive EPA Matching Incentive

- DERA Allocation: $200,000
- Mitigation Trust Fund: $200,000
- EPA Bonus: $100,000
- Total Funding: $500,000

Figure 2: DERA Option: Trust Funds as a Larger Voluntary Match to Achieve Additional NOx Reductions

- DERA Allocation: $200,000
- Mitigation Trust Fund: $1 M
- EPA Bonus: $100,000
- Total Funding: $1.3M

NOTE: Graphic does NOT include mandatory cost share funds.
INVESTMENTS IN CLEAN DIESEL TECHNOLOGY WILL YIELD MORE CLEAN AIR BENEFITS FOR THE DOLLAR AND DELIVER THOSE FASTER THAN OTHER TECHNOLOGIES
Clean Diesel Technology is Ready Today to Reduce NOx Emissions

✓ Available
✓ No additional infrastructure investments needed
✓ Proven to deliver NOx reductions
✓ Cost-effective - will yield more clean air for the dollar than other fuels and technologies
Evolution of Diesel Technology

EPA Heavy-Duty Engine Emission Standards

- Steady State Test
- NOx + HC
- NOx (Unregulated)
- Transient Test
- NOx
- PM (Unregulated)
- Urban Bus PM

Epidemiologic Studies

ACES 2007, 2010 engines
Clean Diesel Technology Meets Near Zero Emissions Requirements

Engine Emissions Standards for Heavy-Duty Vehicles

- NOx (g/bHp-hr)
- PM (g/bHp-hr)

2010 Emissions Standard

Class 3 - 8
Replacing the Oldest Trucks with the Newest Generates Substantial Emissions Reduction

Engine Emissions Standards for Heavy-Duty Trucks and Annual NOx Emissions Reduction from Moving to New Clean Trucks

- 2011 or Newer Emissions Standard
- NOx (g/bhp-hr)
- 1,282 lbs
- 1,061 lbs
- 840 lbs
- 396 lbs

Year:
- 1988
- 1991
- 1994
- 1997
- 2000
- 2003
- 2006
- 2009
- 2012
- 2015
3 out of 4 trucks on the road in CA are eligible for funding through the Trust

<table>
<thead>
<tr>
<th>Class 3-8 Trucks</th>
<th>Class 8 Trucks</th>
<th>Transit Buses</th>
<th>School Buses</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>See Note</em></td>
<td><em>Over 26,000 lbs GVW</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CNG</td>
<td>CNG</td>
<td>CNG</td>
<td>CNG</td>
</tr>
<tr>
<td>Gas</td>
<td>Gas</td>
<td>Electric</td>
<td>GAS</td>
</tr>
<tr>
<td>Diesel</td>
<td>Diesel</td>
<td>DIESEL</td>
<td>DIESEL</td>
</tr>
<tr>
<td>1%</td>
<td>3%</td>
<td>45%</td>
<td>11%</td>
</tr>
<tr>
<td>28%</td>
<td>1%</td>
<td>1%</td>
<td>8%</td>
</tr>
<tr>
<td>70%</td>
<td>97%</td>
<td>53%</td>
<td>81%</td>
</tr>
</tbody>
</table>

23% of the Diesel fleet in CA is MY 2010 or newer
25% of the Diesel fleet in CA is MY 2010 or newer
53% of the Diesel fleet in CA is MY 2010 or newer
19% of the Diesel fleet in CA is MY 2010 or newer

National Average: 30%
National Average: 31%
National Average: 35%
National Average: 31%

*NOTE: Only Class 4-8 trucks are eligible for VW Settlement Funding. This data includes class 3-8.*

SOURCE: DTF Analysis of Commercial Vehicles in Operation (2016), compiled by IHS Markit
A typical Class 8 tractor on the road for 125,000 miles each year. A clean diesel engines will:

- Reduce NOx Emissions by 2.3 tons
- Reduce Fine Particle Emissions by 251 pounds
- Save 23 barrels of crude oil
- Eliminate 9.7 tons of CO2 emissions
- Additional Short Lived Climate Pollutant Reduction
... And, Investing in new clean diesel technology will achieve dramatic reductions in PM emissions ....

Health Effects Institute ACES Study of New Technology Diesel Engines Finds Major declines in PM Mass and Numbers Emissions
CO2 Reduction

A single Class 8 truck on the road for 125,000 miles a year will:

- Save **960 gallons of fuel**
- Save **23 barrels of crude oil**
- Reduce CO2 emissions by **9.8 tons**

If ½ the Fleet of HD trucks were MY 2010 or newer, an additional **1.4 million tons** of CO2 could be eliminated.

Black Carbon Reduction

*Figure 1. 2013 Anthropogenic Black Carbon Emissions and Projected 2030 Emissions* with Existing Measures

**Why wait until 2030 to reduce Black Carbon Emissions?**
AND Even More Co-Benefits Can be Achieved ... California Businesses and Municipalities are Choosing Advanced Bio Fuels

Clean Air and Carbon Reduction Benefits of **Renewable Diesel Fuel**

**Clean Air Benefits – Reduce NOx Emissions by 9%**

**Advanced Biofuel** = capable of achieving at least 50% reduction in GHG emission, according to U.S. EPA. Renewable Diesel is capable of achieving 80% GHG reduction.

**Consumption By 2020:**
- 400 million gallons of renewable diesel
- 177 million gallons of biodiesel.
- Total, bio-based diesel fuels will displace 3.6 billion gallons of petroleum based diesel fuel.

**Who’s Making the Switch?**
- San Francisco
- Oakland
- Walnut Creek
- San Diego
- Carlsbad
- Sacramento County
- Beverly Hills
- UPS
- Google
- Disney
- Ryder
Off-Road Engines & Equipment

LARGE ENGINES
LARGE OPPORTUNITIES
LARGE BENEFITS
"Older trucks and equipment are longstanding fixtures of many port operations, and it will take many years before these fleets turn over to newer technology."

"Accelerating the retirement of older port vehicles and equipment and replacing them with the cleanest technology will reduce emissions and increase public health benefits beyond what would be achieved without further voluntary actions."

"For example, the emission reductions from replacing older drayage trucks with cleaner diesel trucks is significant, with NOx emissions being reduced by up to 48% in 2020 and PM2.5 emissions being reduced by up to 62% as compared to the Business as Usual case."

https://www.epa.gov/ports-initiative/national-port-strategy-assessment
Big Engines Yield **BIG** NOx Reductions

**Switch Locomotive**

- 94% Reduction in NOx from oldest to newest “Tier 4”
- Replacing the Oldest Engines with “Tier 4” Clean Diesel
- 37,602 LBS NOx/Year

OR

- Replacing 29 pre-1992 Port Trucks with New Model
- Replacing 30,000 Cars with a Zero Emission Option

A Single Tug Boat Replacement is Equivalent to 74,000 EV Car Replacements

91% Reduction in NOx from oldest to newest “Tier 4”

Replacing the Oldest Engines with “Tier 4” Clean Diesel

96,000 LBS NOx/Year = Replacing 76 pre-1992 Port Trucks with New Model

OR

Replacing 74,000 Cars with a Zero Emission Option

Replacing the Oldest Ferry Boat Engines with New Technology Delivers Immediate Benefits

Ferry

90% Reduction in NOx from oldest to newest “Tier 4”

Replacing the Oldest Engines with “Tier 4” Clean Diesel = 62,000 LBS NOx/Year

Replacing 48 pre-1992 Port Trucks with New Model

OR

Replacing 48,000 Cars with a Zero Emission Option

Nothing Beats Clean Diesel When it Comes to:

Cost Effectiveness of Reducing Emissions

Making the Most of Environmental Mitigation Fund Investments
# Clean Diesel Maximizes NOx Reduction Investments for California

## How to Make the Most of a $423 million Investment for Immediate NOx Reduction

<table>
<thead>
<tr>
<th>Price Per Application</th>
<th># of Vehicles or Equipment placed into Service for $423 million</th>
<th>Anticipated NOx Reduction per Year per Project</th>
<th>Total Cost to Exclusively Fund a Particular Project</th>
<th>Cost to Remove Each lb of NOx ($/lb)</th>
<th>Total NOx (lbs) Reduction per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre 1991 port truck replacement with <strong>Clean Diesel</strong></td>
<td>$110,000</td>
<td>3,845</td>
<td>1,282</td>
<td>$423,000,000</td>
<td>$86</td>
</tr>
<tr>
<td>pre 1991 port truck replacement with CNG</td>
<td>$140,000</td>
<td>3,021</td>
<td>1,292</td>
<td>$423,000,000</td>
<td>$108</td>
</tr>
<tr>
<td>MY2000 bus replacement with Hydrogen</td>
<td>$1,200,000</td>
<td>353</td>
<td>1,162</td>
<td>$423,000,000</td>
<td>$1,033</td>
</tr>
<tr>
<td>MY2000 bus replacement with Battery-Electric</td>
<td>$880,000</td>
<td>481</td>
<td>1,162</td>
<td>$423,000,000</td>
<td>$757</td>
</tr>
<tr>
<td>MY2000 bus with <strong>Clean Diesel</strong></td>
<td>$370,000</td>
<td>1,143</td>
<td>1,062</td>
<td>$423,000,000</td>
<td>$348</td>
</tr>
<tr>
<td>Tier 0 to Tier 4 <strong>Clean Diesel</strong> switch locomotive</td>
<td>$3,000,000</td>
<td>141</td>
<td>37,602</td>
<td>$423,000,000</td>
<td>$80</td>
</tr>
</tbody>
</table>

Environmental Justice Communities Can Benefit the Most

Environmental Justice Communities Have Not Experienced the Benefits of California’s Clean Vehicle Program.

Immediate Term Emission Reductions are Achievable Today to Generate Immediate Term Benefits to Those Most In Need.

Use of Appendix D Funding to Introduce Proven & Available Technologies Can Operate Alongside California’s Zero Emission Technology Programs.
Port of Long Beach/Port of Los Angeles Clean Truck Program Validates Replacement Strategy

By 2010, all ~16,000 dray trucks must meet MY2007 USEPA emissions requirement

- PM emissions reduced by 97%
- NOx emissions reduced by 71%

SOURCE: Air Emissions Inventory, Port of Los Angeles
The VW Environmental Mitigation Trust provides unique opportunities to have a near term beneficial impact on air quality. Policymakers should utilize a framework that considers the largest sources of NOx emissions & the greatest opportunity for reductions that makes most of the dollars available.

Investments in new clean diesel technology to mitigate NOx emissions are the best choice because

- Faster, near term proven clean air benefits accrue by replacing old technology with new clean diesel, which is readily available today, without additional infrastructure or other investments.
Project simplification and streamlining – replacing a few targeted oldest and largest engines reduces overall state administrative burdens, as compared to other approaches where infrastructure investments and technology availability require additional time and have greater uncertainty. Existing mechanisms provided via DERA.

Replacing older diesel engines with new clean diesel ones yields additional collateral air quality emissions reductions in particulate matter, CO2 benefits beyond NOx mitigation accrue often in population centers, and can help address other issues.
"U.S. states are about to receive a windfall — their portion of the $2.7 billion Environmental Mitigation Trust fund established by Volkswagen in the wake of its diesel emissions scandal. State legislators, who will ultimately decide how to spend those shares of the money, may be tempted to use the millions to plug budget shortfalls or fund pet projects, as was the case in many states from the $100 billion tobacco settlement in 1998.

They should resist that temptation.

Legislators might have a bigger impact by, for example, helping school districts upgrade their aging bus fleets or incentivizing trucking companies to get older, higher-polluting vehicles off the road.

In short, the funds are best spent on their intended purpose: reducing air pollution."
California Needs Clean Air...So Let’s Get it Done!

“Accelerating the turnover of older commercial diesel trucks and heavy-duty rail and marine engines to newer models is a proven strategy to mitigate NOx emissions. California policymakers know that. It’s what they’ve been saying for years.

It’s a strategy that can yield more clean air for the dollar and deliver it faster to more people. Now it’s time to get it done.”
Resources for Clean Diesel in California
www.dieselforum.org/california
Large Engine Upgrades Deliver Enormous Emission Reduction Benefits

Learn more about the VW Environmental Mitigation Fund and Download this Infographic

http://dieselforum.org/vwfund
Switch Locomotive “Repowers” are a Cost Effective NOx Reduction Strategy

Learn more about the VW Environmental Mitigation Fund and Download this Infographic

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Replacing 1 of the oldest engines with the newest clean diesel Tier 4 engines removes 37,602 lbs of NOx / Year. This is equivalent to...

Tier 4 = Near Zero Emissions

Upgrading Locomotive Switch Engines Delivers Cleaner Air Faster

By 2020, the U.S. EPA estimates that only 5% of switch engines in service will be powered by the latest clean diesel engine. The VW Environmental Mitigation Trust represents an opportunity to get the latest clean diesel technology into service faster to generate significant air quality benefits immediately.
A New Tier 4 Clean Diesel Engine Powering a Ferryboat Significantly Reduces NOx Emissions

Learn more about the VW Environmental Mitigation Fund and Download this Infographic
http://dieselforum.org/vwfund
Questions & Answers

Please submit via the Q&A feature.
Resources Available

- Link to Partial Consent Decree: www.epa.gov/enforcement/partial-consent-decree-volkswagen
- Link to FAQs: https://www.epa.gov/enforcement/faqs-beneficiaries-vw-mitigation-trust-agreement
- CARB: https://www.arb.ca.gov/msprog/vw_info/vw-diesel-info/vw-diesel-info.htm
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- July, 2017 Date TBA – Cost Effectiveness of Big Engine Replacements and How to Pursue Opportunities
Thank you for attending! Please complete our brief 3 minute survey at the conclusion of today’s session.

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