

RFI Response: VW Settlement Opportunity

North Little Rock, AR

October 31, 2017





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RFI Response Introduction

- The intention of this response is to:
 - Further support recommendations with regards to the Arkansas VW Mitigation Grant RFI,
 - Provide information on Cummins' industry-leading products in diesel, natural gas, electrical power systems, and how it can support Arkansas' state programs related to the VW settlement,
 - Demonstrate Cummins' capabilities and experience with execution of emissions solutions across a broad array of applications.



About Cummins

Who We Are

WHO WE ARE

*Cummins Inc., a global power leader,
is a corporation of complementary
business units that design,
manufacture, distribute and service
engines and related technologies,
including fuel systems, controls,
air handling, filtration, emission
solutions and electrical power
generation systems.*

WORLD HEADQUARTERS

500 Jackson St.
Columbus, IN 47201

EST.

1919



www.cummins.com

CMI

STOCK SYMBOL
(New York Stock Exchange)

55,200

**EMPLOYEES
WORLDWIDE**

More than 50 percent of the company's
employees are located outside the United States.
(approximate employee total, as of Dec. 31, 2015)

CUSTOMERS

Cummins' customers are located in approximately
190 countries and territories that the company reaches through
a network of more than **600 company-owned and independent
distributor locations** and approximately **7,200 dealer locations**.

FORTUNE 500 RANKING (2016)

148

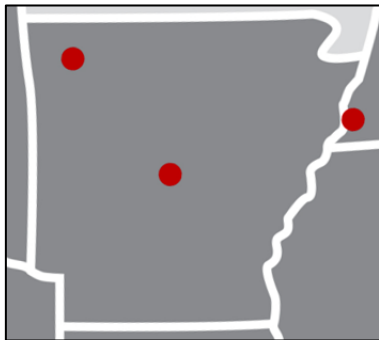
SALES / EARNINGS

In 2015, Cummins earned
\$1.4 billion on revenues of

\$19.1 billion

Arkansas Presence

- 43 Full-time local employees offer parts, warranty, sales, engineering, and service support, in the field and at our branch locations
- 20 factory-certified technicians
- 2 Arkansas Sales and Service Locations
 - North Little Rock
 - Springdale



Industry-Leading Expertise

International Presence

Local Impact



Arkansas Community Involvement Initiatives

- 100% employee participation, and hundreds of hours of work annually
- Oil Changes for domestic abuse survivors
- Vocational Training with the National Youth Challenge

HOW WE DO IT

The company is organized into four business units. In 2015 and early 2016, Cummins went through some restructuring designed to help the company innovate faster and bring more value to customers.



CUMMINS ENGINE BUSINESS

The **Engine Business** manufactures and markets diesel and natural gas engines for on- and off-highway use around the world. Markets include heavy- and medium-duty trucks, buses, light-duty trucks and industrial uses in segments such as agriculture, construction and military equipment.

CUMMINS POWER SYSTEMS

Cummins **Power Systems** is a global provider of power generation systems, components and services in standby power and distributed power generation. It provides a full range of services including turnkey and temporary power solutions. Cummins continues to produce high horsepower engines for ships, trains, generators and more, but that function moved from the Engine Business to the new Power Systems business.

COMPONENTS BUSINESS

Cummins Emission Solutions designs and builds exhaust aftertreatment solutions to reduce emissions for light-, medium-, heavy-duty and high horsepower engines.

Cummins Filtration designs and builds heavy-duty air, fuel, hydraulic and lube filtration, and chemical and exhaust system technology products.

Cummins Fuel Systems designs and manufactures fuel systems that maximize power and fuel economy while helping to reduce emissions.

Cummins Turbo Technologies designs and builds turbochargers to maximize performance and reduce emissions and fuel consumption.

CUMMINS DISTRIBUTION BUSINESS

Cummins Distribution Business sells and services the full range of Cummins products for over 20 application segments in more than 190 countries and territories around the world.

OUR RECOGNITION

Cummins' 2015 - 2016 sustainability awards

CORPORATE RESPONSIBILITY / ETHICS

WORLD'S MOST ETHICAL COMPANIES

Cummins was named to Ethisphere's 2016 list of **World's Most Ethical Companies** for a ninth consecutive year.



Cummins was one of 10 global companies awarded the **Golden Peacock for Excellence In Governance** in 2015.



Cummins in 2015 was named to the **FTSE4GOOD Index** for demonstrating strong social, governance and environmental practices.

TOP COMPANIES FOR CORPORATE RESPONSIBILITY

Cummins India was named one of India's **Top Companies for Corporate Responsibility** in 2015 by The Economic Times, a leading Indian financial newspaper.

ENVIRONMENT

MEMBER OF
Dow Jones Sustainability Indices
In Collaboration with RobecoSAM

Cummins was named to the 2015 **Dow Jones Sustainability Index for North America**. It has been on the index since 2006.



Cummins was named to CDP's **Climate Disclosure Leadership Index** in 2015.



Cummins in 2016 received the Clean Energy Ministerial's **Award of Excellence in Energy Management**, one of only three ISO 50001-certified organizations to be honored.

DIVERSITY / WORKPLACE



Cummins received a perfect score for an 11th consecutive year in the 2016 **Corporate Equality Index** from HRC, the largest U.S. civil rights organization for LGBT employees.

TOP 25 EMPLOYERS IN AMERICA

Forbes named Cummins one of its **Top 25 Employers in America** in 2016.



Cummins was named one of the **Top 50 Companies for Diversity** by DiversityInc for a 10th consecutive year in 2016.

MILITARY FRIENDLY EMPLOYER

Cummins was named a 2016 **Military Friendly Employer** by the publisher of G.I. Jobs and Military Spouse.

BUSINESS / PRODUCT

BEST PICKUP FOR 2016

The Cummins-powered 2016 Nissan TITAN XD was named **Best Pickup for 2016** by Cars.com, PickupTrucks.com and AutoGuide.com.

2015 PRODUCT OF THE YEAR

Consulting-Specifying Engineer named the GSK95 Series generator its **2015 Product of the Year**.

TOP 25 SUPPLY CHAIN COMPANY

For a fourth consecutive year, Cummins was named a **Top 25 Supply Chain Company** by Gartner, an IT, research and advisory company.

KEY PERFORMANCE INDICATORS

Cummins takes a broad view of sustainability, including the environment, corporate responsibility, safety, diversity, employee development and governance. The company uses a number of key performance indicators (KPIs) to evaluate how it's doing.

You will find them listed throughout this report.



Cummins believes in transparency. This icon identifies multi-year data that allows for comparisons.

¹ Primary energy excludes sold electricity and associated fuel usage

² Intensity defined as adjusted for sales (energy / GHG) or hours worked (water)

³ Reduction includes consolidated entities only

ECONOMIC

	2013	2014	2015
Revenue	\$17.3 billion	\$19.2 billion	\$19.1 billion
Net Income	\$1.48 billion	\$1.65 billion	\$1.40 billion

ENVIRONMENTAL

	2013	2014	2015
GHG emissions (thousands of metric tons CO ₂ e)	750	788	774
Energy consumption ¹ (thousands of MMBtu)	12,079	12,739	12,903
Water use (millions of gallons)	958	972	953
Water intensity reduction ² (since 2010)	30%	36%	41%
Energy intensity reduction ^{2,3} (since 2005)	30%	34%	33%
GHG intensity reduction ^{2,3} (since 2005)	33%	35%	36%
Recycling rate	89%	90%	90%

SOCIAL

	2013	2014	2015
Major injury rate	0.04	0.043	0.039
Incidence rate	0.65	0.61	0.57
Women leaders in the workforce	20%	20%	21%
Every Employee Every Community (EEEC) participation rate	68%	73%	80%
Number of Environmental Challenge participants	11,500	13,600	21,600
Greenhouse gas reduction as part of the Environmental Challenge (thousands of metric tons)	19	22.4	36.8



What Cummins Can Offer

We unleash the Power of Cummins by demanding that everything we do leads to a cleaner, healthier, safer environment



Cummins Confidential

More emissions reductions can be attained per dollar spent with clean diesel and natural gas

The U.S. Department of Transportation and the U.S. Environmental Protection Agency found that **1 ton of NOx emissions** may be eliminated by investing, on average, **\$20,000** in clean diesel technology versus, on average, **\$1 million** in electric infrastructure

\$5 million spent towards natural gas powered vehicles, **reduce 3,800 tons** of smog forming emissions compared to **1,200 tons** from an Electric Vehicle powered from the grid



Replace or Repower with Clean Diesel or Natural Gas



Transit Buses

Ferries/Tugs



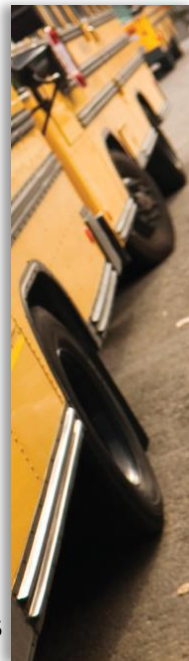
Local Freight Trucks/
Port Drayage Trucks



Switcher Locomotives



School Buses



Depend on
Cummins.



The Right Technology for Today

With technology available today, more emissions reductions can be attained per dollar spent with clean diesel and natural gas

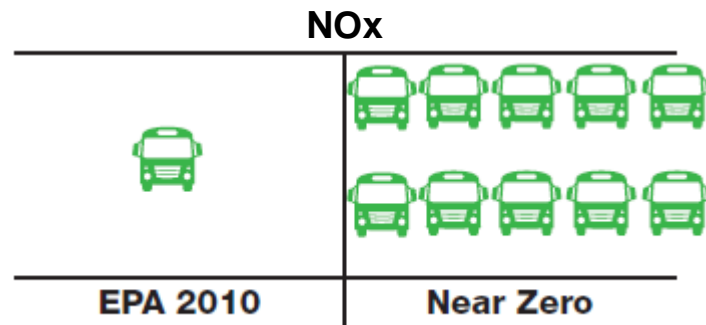
- The U.S. Department of Transportation and the U.S. Environmental Protection Agency found that **1 ton of NOx emissions** may be eliminated by investing, on average, **\$20,000** in clean **diesel** technology versus, on average, **\$1 million** in electric infrastructure*
- **\$5 million** spent towards **natural gas** powered vehicles, **reduce 3,800 tons** of smog forming emissions compared to **1,200 tons** from an Electric Vehicle powered from the grid**

*Congestion Mitigation and Air Quality (CMAQ) Improvement Program Cost-Effectiveness Tables Development and Methodology (December 3, 2015)

**Game Changer Technical White Paper: Next Generation Heavy-Duty Natural Gas Engines Fueled by Renewable Natural Gas;" May 2016; Gladstein, Neandross & Associate

Natural Gas

- Cummins offers natural gas solutions for both bus and truck repowers as well as new vehicles
- The ISL G Near Zero engine NOx emissions is 90% lower than the EPA 2010 standard, which is **as equivalent to a 100% battery truck** using electricity from a modern combined cycle natural gas power plant
- Near Zero technology will be added to the ISX12 G in 2018



In terms of NOx emissions, each ISL G EPA 2010 vehicle is equivalent of 10 Near Zero vehicle

Cummins can Provide a Positive Environmental Impact from Natural Gas Near Zero technology

- Minimum cost impact vs current natural gas product
- No infrastructure changes for current NG fleets
- **Vehicles cost up to 70% less than electric**
- Reduce PM by 80% vs. EPA 2010 standard
- Reduce NOx by 90% vs. EPA 2010 standard
- Reduce GHG by 15% vs. EPA 2010 standard

Natural Gas – Example

- Over the years Cummins has successfully repowered hundreds of older Natural Gas engines in transit buses for major transit authorities across the US
- Current Cummins Arkansas CNG customers: Rock Region Metro, Little Rock Waste Management



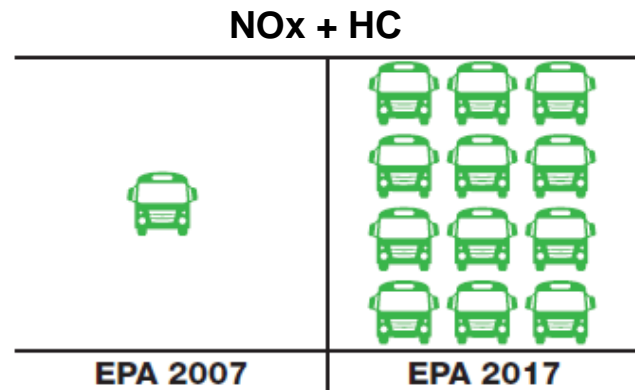
Cummins ISL G Near Zero



- Options available for transit and shuttle buses, school buses, refuse, vocational, and conventional trucks

On Highway

- Cummins offers clean diesel and natural gas solutions for On Highway truck and bus repowers and vehicle replacements
- Cummins has the capability to repower older engines with newer, cleaner solutions
- The EPA 17 products launch will continue our commitment to a cleaner and healthier environment, and bring the emission and fuel economy to a new level



In terms of NOx+HC emissions, each EPA 07 vehicle is equivalent of 12 EPA 17 vehicles

Cummins can Provide a Positive Environmental Impact from EPA 17 products

- Cummins EPA 17 X15 engine can achieve up to 20% of fuel economy compared to EPA 10 version of the same engine model, which means about 2,500 fewer gallons of fuel for a truck running 120,000 miles per year
- Emission Improvement: In terms of NOx+HC, for each EPA 07 powered vehicle, the equivalent of 12 EPA 17 vehicles could be on the road today

On Highway – Repower Example

- Cummins has repowered hundreds of engines manufactured by another OEM with new EPA 07 ISB6.7 engines
- Cummins demonstrated strong engineering capability by replacing two different engine models installed in these buses

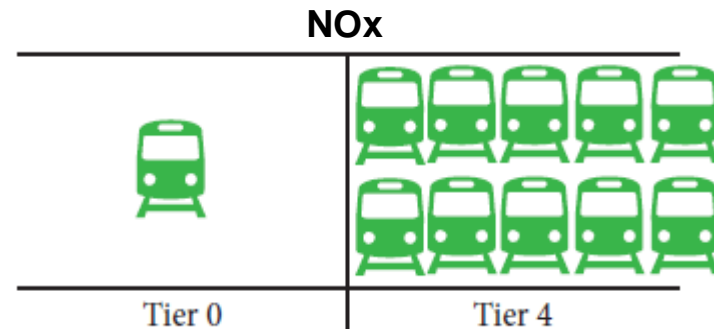


Cummins EPA 07 ISB6.7

- With this repower, customers have achieved up to 17% fuel efficiency improvement on Urban duty cycles
- Other benefits include noise reduction and improved reliability

Switcher Locomotive

- Cummins offers clean diesel solutions for switcher locomotive repowers and replacement
- About **90%** of switcher locomotives were built prior to 1985 long before emission regulations, therefore **10,000+ units** in the United States today are pre-Tier
 - Very high NOx, black smoke, leak oil, fuel & lube oil pass thru the exhaust, loud, ground vibration when left idling
- Many of the historic switch yards also find themselves in neighborhoods and urban areas **where disadvantaged populations reside**. Thus emission & pollution reduction are necessary



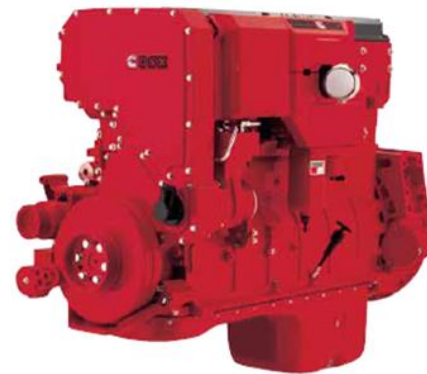
**90% reduction in NOx from Tier 0
to Tier 4 Standards**

Cummins can Provide a Positive Environmental Impact from Tier 4 Locomotive Repowers

- Up to 93% NOx reduction
- Up to 93% PM reduction
- Up to 90% reduction in lube oil consumption
- Up to 18% reduction in Fuel Consumption
- Quieter: High speed engines do not rumble at idle do not affect nearby neighbors with vibration
- Leak free engines: Eliminates spillage on tracks and railroad customer's property

Switcher Locomotive – Repower Example

- In 2013 Cummins began repowering pre-Tier 0 Switcher Locomotives that started operation up to 60 years ago to Tier 4 QSX15 solutions
- The first Tier 4 certified locomotive was Cummins Powered



Cummins Tier 4 QSX15

- About 75 tons of NOx reduction per year per repower engine* compared to the Tier 0 standard
- Significant reduction in Fuel Consumption

** NOx reduction is estimated by using Cummins Certification Engine rating – 600hp and assuming 24/7 operation*



Cummins Sales and Service Repower and Retrofit Capabilities and Experience

- Repowered school buses removing IHC and Cat engines, installing new Cummins clean diesel power
- Repowering Marine Vessels with Cummins power
- Repowering Locomotives
- Retrofitting exhaust systems on both on-highway and off-highway
- Idle Reduction technology with Webasto Fuel Fired Heaters



Exhaust Retrofits

- Installed approximately 2000 Diesel Oxidation Catalyst (DOC) mufflers on school buses, on-highway vehicles, and off highway vehicles
- Installed approximately 175 Diesel Particulate Filters (DPF) systems on school bus and on-highway vehicles

Appendix



Cummins Contact Information

- **Primary Contact**
 - **Doug Powers: General Manager North Little Rock**
 - (501) 569-5619, doug.powers@cummins.com
- **Fleet Account Support**
 - **Darrell Smith: Fleet Account Executive – Arkansas**
 - (501) 580-9476, darrell.smith@cummins.com
- **North Little Rock Sales and Service location**
 - 3115 Highway 391, North Little Rock, AR 72117
- **Springdale Sales and Service Location**
 - 317 N Old Missouri Rd, Springdale, AR 72764

Helpful Links

- VW Settlement Information

<https://www.epa.gov/enforcement/volkswagen-clean-air-act-partial-settlement>

- Includes Consent Decree, FAQ, and other helpful information

- DERA Information

<https://www.epa.gov/cleandiesel>

- Includes current and historical information on DERA

- Ozone Non-attainment Information (including Maps)

- <https://www.epa.gov/green-book/green-book-8-hour-ozone-2008-area-information>

- State 3rd Party Associate Information

- <https://cleancities.energy.gov/coalitions/locations/>

DERA Opportunity

- Current DERA programs may use funds for the non-federal voluntary match
 - Trust Funds cannot be used to meet DERA non-federal mandatory cost share requirements
- Additional markets are covered under DERA that are not covered in the 9 other EMT options
 - Aftertreatment Retrofits
 - Idle Reduction Technology
 - Power Generation
 - Construction
 - Class 4-8 applications not listed directly in EMT

Detailed Comparison of VW Eligible Mitigation Action 1-9 and DERA Option (1/4)

<u>Eligible Mitigation Actions 1-9</u>				<u>*Eligible Mitigation Action 10: DERA Option</u>		
Class 8 Local Freight Trucks and Port Drayage Trucks (Eligible Large Trucks) Class 4-7 Local Freight Trucks (Eligible Medium Trucks) For, 1) Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year trucks at the time of the proposed EMA, and 2) Eligible Trucks shall also include 2010-2012 engine model year trucks.				Class 5-8 Medium and Heavy Duty Highway Vehicles (including Drayage Trucks)		
Activity	Vehicle and Equipment Eligibility (Engine Model Year or Tier)	Trust Funding Limits		Activity	Vehicle and Equipment Eligibility (Engine Model Year or Tier)	DERA Funding Limits
		Non-Gov. Owned	Gov. Owned			
Repower with new diesel or alternate fueled engine with the engine MY (model year) in which the EMA occurs or one engine model year prior	1992-2009	40%	100%	Repower with 2015 MY or newer engine (diesel or alternative fuel)	1994-2006	40%
				Repower with 2015 MY or newer engine certified to CARB's Optional Low-NOx standards	1994-2006	50%
Repower with all-electric engine with the engine MY in which the EMA occurs or one engine model year prior	1992-2009	75%	100%	Repower with 2015 MY or newer all-electric engine	1994-2010	60%
Replacement with new diesel or alternate fueled vehicle with the engine MY in which the EMA occurs or one engine MY prior	1992-2009	25% (50% for Drayage)	100%	Replacement with vehicle powered by 2015 MY or newer engine (diesel or alternative fuel) (2011 or newer for Drayage)	1994-2006	25% (50% for Drayage)
				Replacement with 2015 MY or newer engine certified to CARB's Optional Low-NOx standards	1994-2006	35%
Replacement with all-electric vehicle with the engine MY in which the EMA occurs or one engine model year prior	1992-2009	75%	100%	Replacement with 2015 MY or newer all-electric vehicle	1994-2010	45%
				Retrofits of verified exhaust control technologies	1994-2006	100%
				Verified Aerodynamic Technologies Low Rolling Resistance Tires (in conjunction with above activities)	1994-2006	100%
				Verified Idle Reduction Technologies (in conjunction with above activities)	1994-2006	100%

Detailed Comparison of VW Eligible Mitigation Action 1-9 and DERA Option (2/4)

Eligible Mitigation Actions 1-9				*Eligible Mitigation Action 10: DERA Option		
Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Eligible Buses) For, 1) Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year buses at the time of the proposed EMA, and 2) Eligible Buses shall also include 2010-2012 engine model year class 4-8 school buses, shuttle buses, or transit buses.				Type A, B, C, D Buses Class 5-8 Transit, Shuttle, or other buses		
Activity	Vehicle and Equipment Eligibility (Engine Model Year or Tier)	Trust Funding Limits		Activity	Vehicle and Equipment Eligibility (Engine Model Year or Tier)	DERA Funding Limits
		Non-Gov. Owned	Gov. Owned			
Repower with new diesel or alternate fueled engine with the engine MY in which the EMA occurs or one engine model year prior	2009 and older	40%	100%	Repower with 2015 MY or newer engine (diesel or alternative fuel)	1994-2006	40%
				Repower with 2015 MY or newer engine certified to CARB's Optional Low-NOx standards	1994-2006	50%
Repower with all-electric engine with the engine MY in which the EMA occurs or one engine MY prior	2009 and older	75%	100%	Repower with 2015 MY or newer all-electric engine	1994-2010	60%
Replacement with new diesel or alternate fueled vehicle with the engine MY in which the EMA occurs or one engine MY prior	2009 and older	25%	100%	Replacement with vehicle powered by 2015 MY or newer engine (diesel or alternative fuel)	1994-2006	25%
				Replacement with vehicle powered by a 2015 MY or newer engine certified to CARB's Optional Low-NOx standards	1994-2006	35%
Replacement with all-electric vehicle with the engine MY in which the EMA occurs or one engine MY prior	2009 and older	75%	100%	Replacement with 2015 MY or newer all-electric vehicle	1994-2010	45%
				Idle Reduction Technology (in conjunction with above activities, or on school buses previously retrofitted with verified emission control device)	1994-2006	100%

Detailed Comparison of VW Eligible Mitigation Action 1-9 and DERA Option (3/4)

Eligible Mitigation Actions 1-9				*Eligible Mitigation Action 10: DERA Option		
Freight Switchers Must currently operate 1000+ hours per year.				Line Haul (freight and passenger) and Switcher Locomotives Must currently operate 1000+ hours per year		
Activity	Vehicle and Equipment Eligibility (Engine Model Year or Tier)	Trust Funding Limits		Activity	Vehicle and Equipment Eligibility (Engine Model Year or Tier)	DERA Funding Limits
Repower with new diesel or alternate fueled engine or generator sets that are EPA certified for the engine MY in which the EMA occurs	Pre-Tier 4	40%	100%	Repower with 2015 MY or newer Tier 4 engine	Unregulated – Tier 2; Tier 2+ switcher	40%
Repower with all-electric engine that is engine MY in which the EMA occurs	Pre-Tier 4	75%	100%	Repower with 2015 MY or newer all-electric engine	Unregulated – Tier 2; Tier 2+ switcher	60%
Replacement with new diesel or alternate fueled freight switcher that is EPA certified for the engine MY in which the EMA occurs	Pre-Tier 4	25%	100%	Replacement with vehicle/equipment powered by a 2015 MY or newer engine (diesel or alternate fuel)	Unregulated – Tier 2; Tier 2+ switcher	25%
Replacement with all-electric freight switcher that is engine MY in which the EMA occurs	Pre-Tier 4	75%	100%	Replacement with 2015 MY or newer all-electric vehicle/equipment	Unregulated – Tier 2; Tier 2+ switcher	45%
				Certified Remanufacture System or Verified Engine Upgrade	Unregulated – Tier 2+	40%
				Retrofit with verified exhaust control technology	Unregulated – Tier 2+	100%
				Idle reduction technology, including shore power	Unregulated – Tier 2+	40%
Ferries/Tugs				Marine Engines Must currently operate 1000+ hours per year.		
Repower with new Tier 3 or 4 diesel or alternate fueled engine	Pre-Tier 3	40%	100%	Repower with a 2015 MY or newer Tier 3 or Tier 4 engine (diesel or alternative fuel)	Pre-Tier 3	40%
Repower with new all-electric engine	Pre-Tier 3	75%	100%	Repower with 2015 MY or newer all-electric engine	Pre-Tier 3	60%
Certified Remanufacture System or Verified Engine Upgrade	Pre-Tier 3	40%	100%	Certified Remanufacture System or Verified Engine Upgrade	Pre-Tier 3	40%

Detailed Comparison of VW Eligible Mitigation Action 1-9 and DERA Option (4/4)

Eligible Mitigation Actions 1-9				*Eligible Mitigation Action 10: DERA Option		
Ocean Going Vessels (OGV) Shore Power				Marine Shore Power Connection System		
Activity	Vehicle and Equipment Eligibility (Engine Model Year or Tier)	Trust Funding Limits		Activity	Vehicle and Equipment Eligibility (Engine Model Year or Tier)	DERA Funding Limits
Costs associated with shore-side system	n/a	Non-Gov. Owned	Gov. Owned	Costs associated with shore-side system	n/a	25%
Airport Ground Support Equipment Forklifts and Port Cargo Handling Equipment				Nonroad Diesel Engines		
Repower with new all-electric engine	GSE: Pre-Tier 3 diesel; 3 g/bhp-hr and higher spark ignition	75%	100%	Repower with all-electric engine	0-50 HP = 2004 and newer;	60%
Replacement with new all-electric airport ground support equipment	Forklifts and Port CHE: Greater than 8000 lbs lift capacity	75%	100%	Replacement with 2015 MY or newer all-electric vehicle/equipment	51-300 HP = 1994 and newer;	45%
				Repower with a 2015 MY or newer engine (diesel or alternative fuel)	301+HP = 1984 and newer	40%
				Replacement with vehicle/equipment powered by 2015 MY or newer engine (diesel or alternative fuel)		25%
				Retrofit with verified exhaust control technologies		100%
				Verified Engine Upgrade		40%
				Electrified Parking Spaces (Truck Stop Electrification)		
				Labor and equipment of eligible EPA SmartWay verified electrified parking space technologies	n/a	25%
Light Duty Zero Emission Vehicle Supply Equipment Level 1, level 2, or fast charging equipment that is not consumer light duty electric vehicle supply equipment						

Cummins Product Solutions

EMT Programs	Product/Technology
Class 8 Local and Port Drayage Trucks	X15, X12 (2018), ISX12 G, ISX12 G Near Zero (2018)
Class 4-7 Local Freight Trucks	B6.7, L9, X12 (2018), ISB6.7 G, ISL G Near Zero
Class 4-8 School, Shuttle, or Transit Bus	V5.0, B6.7, X12 (2018), L9, ISB6.7 G, ISL G Near Zero
Freight Switchers	Tier 4: QSX15 (500-675hp), QST30 (1000-1500HP), QSK50 (1500-2250hp), QSK60 (2310-2700hp)
Ferries/Tugs	Tier 3: QSK19, QSK38, QSK50





Thank you for your time

Cummins IS YOUR Partner in
Emissions Solutions