



GOVERNMENT OF PUERTO RICO

ENVIRONMENTAL QUALITY BOARD

AIR QUALITY AREA

APPLICATION AND WORKPLAN AMMENDMENT TO FISCAL YEAR 2017 FISCAL YEAR 2018 STATE CLEAN DIESEL GRANT PROGRAM



National Clean Diesel Campaign

Prepared by: Puerto Rico Environmental Quality Board
Air Quality Area
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Prepared for: U.S. Environmental Protection Agency
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Initial FY-2018: June 5, 2018





WORK PLAN AND BUDGET NARRATIVE

On April 2018 EPA's Office of Transportation and Air Quality is soliciting proposals from eligible states and territories for participation in the fiscal year (FY) 2018 Diesel Emission Reduction Program (DERA), State Clean Diesel Grant Program. Funding can support grant, rebate, and loan programs administered by eligible states or territories that are designed to achieve significant reductions in diesel emissions.

This document contains the Puerto Rico Environmental Quality Board (PREQB) proposal to the EPA's Office of Transportation and Air Quality to amend fiscal year 2017 workplan and application and submit the application for fiscal year 2018 State Clean Diesel Grant Program. In order to maximize resources, once both grants are consolidated, personnel and marginal benefits costs were redistributed in order to acquire more diesel oxidation catalyst (DOC) and low rolling resistance tires (LRRT).

Under the proposal the PREQB propose to install DOC and LRRT for installation in class 8 heavy duty vehicles (HDV) that transit in the metropolitan statistical areas (MSA) of San Juan. The San Juan MSA is one of the more polluted areas in the island. It actually contains a particulate matter maintenance area and a sulfur dioxide non-attainment area for the National Ambient Air Quality Standards.



SUMMARY PAGE

Project Title: Puerto Rico State Clean Diesel Grant Program

Project Manager and Contact Information

Organization Name: Puerto Rico Environmental Quality Board

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Project Budget Overview:

	FY 2017	FY-2018
EPA Base Allocation	\$236,458	275,420
State or Territory Matching Funds (if applicable)	\$236,458	\$ -
EPA Match Incentive (if applicable)	\$118,229	\$ -
Mandatory Cost-Share	\$ -	\$ -
TOTAL Project	\$591,145	\$275,420
Additional Leveraged Resources	\$ -	\$ -

Project Period

October 1, 2018 – September 30, 2019



Summary Statement

Puerto Rico will provide funding for diesel reduction strategies for medium and heavy-duty trucks. Activities will include installation of diesel emissions reduction retrofit devices and low rolling resistance tires for selected private and public entities to reduce diesel emissions in the metropolitan area.

Puerto Rico asthma prevalence is higher than in the U.S. The goal of the Puerto Rico State Clean Diesel Grant Program for FY 2018 is to identify priority fleets of private and public entities to install retrofits devices and low rolling resistance tires. This will result in emissions reductions throughout the useful life of the devices and/or equipment, potentially up to six years or more. Which in turn, will help to reduce asthma related health problems.

SCOPE OF WORK

Project Description

The Puerto Rico State Clean Diesel Grant Project proposal for FY 2018 was intended for the installation of retrofit devices on private and public entities-owned medium and heavy-duty trucks. Activities will include installation of diesel emissions reduction retrofit devices and low rolling resistance tires for selected private and public entities to reduce diesel emissions in the metropolitan area. The proposed target fleet consist of 94 mid or heavy-duty trucks for FY2017 funds and 46 mid or heavy-duty trucks for FY-2018 for engine model years 1995 to 2006.

The goal of the Puerto Rico State Clean Diesel Grant Program for FY 2017-2018 is to identify fleets of private and public entities to install retrofits devices and low rolling resistance tires. This will result in emissions reductions throughout the useful life of the devices and/or equipment, potentially up to six years or more.

The project intends to minimize the exposure to diesel exhaust, island wide; concentrated efforts will be placed in the San Juan Metropolitan Statistical Area (MSA) as defined by the U.S. Census Bureau¹. This MSA has large residential and commercial complexes and the major commercial maritime port of the island. It consists of urban spaces that combine elements of social, economic, health and environmental problems, among others.

An additional component of our project will promote strategies aimed at achieving behavioral change within specific sectors. We intend to provide guidance and share educational information with medium and heavy-duty trucks drivers and owners to raise awareness of the environmental and health impacts of diesel emissions, and the current emissions regulations and programs available to aid in emissions reduction. We will schedule meetings and distribute educational materials.

¹ https://www2.census.gov/geo/maps/metroarea/stcbsa_pg/Feb2013/cbsa2013_PR.pdf



Goals and Priorities

1. Maximize public health benefits;

The contamination produced by diesel emissions in Puerto Rico is hardly recognized as an environmental problem even though a high percentage of our population have respiratory afflictions due to this and other sources of air pollution both man made and from natural sources. Diesel emissions contain a hazardous mixture of pollutants that have serious health effects. Diesel exhaust has been linked to the onset or worsening of most major, chronic and/or terminal ailments, including cancer, emphysema, auto-immune disorders, asthma, heart disease, stroke, and the underdevelopment of children's lungs. When inhaled, fine particles in diesel exhaust penetrate the lungs and remain there indefinitely to aggravate or create both lung and heart conditions. Research also indicates diesel emissions cause premature deaths within populations and occupations where people are regularly exposed to these toxins. For this reason, diesel exhaust is one of the most toxic forms of air pollution.

There is evidence, corroborated by the existing epidemiological data, that air pollution is associated with adverse impacts on human health. The most sensitive groups which seem to present the highest risk include persons of advanced age, smoking, children and people with respiratory or cardio-pulmonary problems such as asthma and allergies.

According to the Centers for Disease Control and Prevention of the United States, Puerto Rico has some of the highest incidences of asthma in the Nation. This is due to the combustion generated by mobile sources that use diesel, among other factors. It's important to reduce these emissions, because emissions from mobile sources using diesel fuel contain a toxic mix of gases and particulate matter that are harmful to health.

Puerto Rico has been seeking ways to reduce diesel engine emissions and alleviate health concerns for several years. Puerto Rico has one of the highest asthma prevalence rates in the U.S. The Epidemiological Profile of Asthma in Puerto Rico (Puerto Rico Department of Health)² the lifetime prevalence of asthma in Puerto Rico is 19.6 percent compared to 11.8 percent in the U.S., with an increase in asthma prevalence over time (15.9% in year 2000 vs. 19.6% in year 2002) In addition, according to same study the prevalence of asthma in adults is 10.6 in Puerto Rico versus 8.9 in United States of America.

The Puerto Rico Department of Health and as published on its Asthma Surveillance Report 2014, the Puerto Rican population suffers from the highest asthma prevalence, morbidity and mortality rate of all states and territories of the United States of America. In addition, according to the Asthma Facts of EPA on August 2015 "*The rate of asthma among Puerto Ricans is 113% higher than non-Hispanic Whites and 50% higher than non- Hispanic Blacks*".

² https://estadisticas.pr/files/BibliotecaVirtual/estadisticas/biblioteca/DS/DS_Informe_Vigilancia_Asma.pdf



The San Juan MSA contains attainment area with a limited maintenance plan for PM₁₀ and a recently designated non-attainment area for SO₂. The San Juan Municipality is the densest populated area in Puerto Rico with 2,112,005 inhabitants³. The situation is aggravated since there are not sufficient or reliable alternatives of mass transportation. According to the Department of Transportation and Public Works (DTOP) data, in 2010, the total number of cars on the island was 3,020,455.

2. Due to the location of the San Juan maritime port, this area receives a disproportionate quantity of air pollution from diesel fleets, including truck stops, ports, rail yards, terminals, and distribution centers or that use a community-based, multi-stakeholder collaborative process to reduce toxic emissions;

Pollution emitted by diesel fueled engines is one of the major contributor to the poor air quality found. The amount of traffic congestion combined with emissions from nearby major sources of air pollution industries affect the quality of the air in the San Juan MSA. In 2015, the Puerto Rico Electric Power Authority, Puerto Nuevo Plant issued 223.55 ton/year and Palo Seco Plant 223.55 ton/year of PM_{2.5}. The Bacardi Rum Plant reported 2.56 ton/year of PM_{2.5} and Goya Puerto Rico reported 0.47 ton/year of PM_{2.5}. The area also contains the major grain handling facilities of the island, several industrial parks, queries and asphalt plants.

3. Include a certified engine configuration or verified technology that has a long expected useful life; will maximize the useful life of any certified engine configuration or verified technology used or funded by the eligible entity; and conserve diesel fuel.

All retrofit devices and low rolling resistance tires to be installed under this project will only use EPA verified diesel technologies. This project is well aligned with the priorities of EPA Region 2 and will significantly benefit local communities' island wide for the next 5 years. After installation, the company contracted for the installation of the equipment or an independent contractor will certify the installation of the equipment.

Vehicle and Technologies

Diesel Oxidation Catalyst (DOC) are exhaust after-treatment devices that reduce emission from diesel fueled vehicles and equipment. DOCs are widely used as a retrofit technology because of their simplicity and limited maintenance requirements.

DOCs verified by EPA and CARB are typically effective at reducing emissions of particulate matter (PM) by 20 to 40 percent. EPA's Verified Technology List also shows that DOCs may reduce hydrocarbons by 40 to 75 percent and carbon monoxide by 10 to 60 percent.

SmartWav verified Low Rolling Resistance Tires (LRRT) can help cut down fuel costs. According to EPA, certain LRRT can reduce both cost and emission for long haul class 8 tractor-trailers by 3% or more. To achieve fuel savings SmartWav verified LRRT should be installed on all axle

³ U.S. Census Bureau, data as July 1, 2017



positions of tractors. Since the trailer is not included, for purpose of determine emission reduction a 2% reduction is used in the emission quantifier.

The estimated costs for diesel oxidation catalyst (DOC) is \$2,000.00 each, plus an installation per unit of \$200.00 each. The estimated Low Rolling Resistance Tire (LRRT) is estimated in \$400.00 each. Assume 8 tires per vehicle the total cost per unit will be \$3,200.00 plus \$100 installation cost. If there is any leftover funding will be used for equipment or installation costs above the estimated amount, or returned to EPA.

The PREQB will retrofit with DOC and acquire LRRT for Class 8 heavy duty vehicles for engines model years 1995 to 2006. PREQB will contract a mechanic to perform an initial inspection to verify that the unit is in conditions to participate in the program and a final inspection to certify that the emission reduction technology was installed and the equipment is operating in good conditions.

Exhaust retrofit technologies DOC and LRRT will be purchased by PREQB and installed by mechanics or an installation center contracted by PREQB. All exhaust retrofit technologies must be approved by either the US Environmental Protection Agency's (EPA) or the California Air Resources Board's (CARB) Retrofit Verification Programs. The LRRT will be SmartWay verified.

Roles and Responsibilities

The PREQB will be the entity responsible for all project aspects. The Manager of the Air Quality Area will be the Project Manager for this project. He will be assisted by Eng. Yolanda Martinez in all aspects of the project. The agency will identify resources to install and certify the installation of the equipment.

Timeline and Milestones

Our project schedule will be as follows:

Activity	Expected Time
Identify resources and contractors	October 31, 2018
Public Notice Retrofit RFP	October 31, 2018
Evaluation and Grantee Selection	November 2018 – January 2019
Request RFP for contractors	February – March 2019
Procurement Process	April 15, 2019
Equipment Distribution and Installation	June – August 2019
Inspection and Monitoring	August – September 2019

DERA Programmatic Priorities

The principal objective of the assistance to be awarded under this program is to achieve significant reductions in diesel emissions in terms of tons of pollution produced and reductions in diesel



emissions exposure from vehicles, engines and equipment operating in areas designated as poor air quality areas. As previously discussed, the project will impact the MSA of San Juan, one of the major polluted areas in the island with the highest population density. The San Juan MSA is the location where the vast majority of the HDV of the island operate, or transit through.

Based on the programmatic priorities in Section VIII.D of the Program Guide, the San Juan MSA meet the following priority location requirements:

- Is a maintenance area for particulate matter and a non-attainment area for sulfur dioxide.
- Within its limits is located the major maritime port of the island.
- Due the population density of the area, is common to find within its limits commercial or heavy civil construction sites.
- Due the population density it contains school bus and public transport depot/yards,
- Due to the location of the maritime port, the area contains multiple distribution centers.

EPA’s Strategic Plan Linkage and Anticipated Outcomes/Outputs

1. Linkage to EPA Strategic Plan

In order to support EPA’s 2014- 2018 Strategic Plan Goal 1, ‘Addressing Climate Change and Improving Air Quality,’ Objective 1.2, ‘Improve Air Quality,’ which states, “achieve and maintain health-and welfare-based air pollution standards and reduce risk from toxic air pollutants and indoor air contaminants.” Specifically, the proposed activities must reduce emissions from diesel fleets, thereby reducing local and regional air pollution of criteria pollutants, air toxics, and greenhouse gases, Puerto Rico Clean Diesel Grant Program will help reduce overall emissions from engines, vehicles and equipment operating in the Island. We will do this by installing retrofit technology, and replacing vehicles tires with LRRT.

2. Outputs and Outcomes

Activities	Outputs	Outcomes
Install retrofit devices	Install 94 DOC on FY-2017 Install 46 DOC on FY-2018	Emissions Reductions in PM, HC and CO.
Low rolling resistance tires	Install 752 LRRT on FY-2017 Install 368 LRRT on FY-2018	Emissions Reductions in NO ₂ , PM, HC, CO and CO ₂ .
Diesel Emissions Reduction and Asthma Education	Distribute diesel emission awareness information and project information (education and guidance) through meetings and distribution of educational materials	Increase awareness of project and results.



Cost effectiveness of emissions reductions over the lifetime of this project, as estimated by the U.S. EPA’s Diesel Emissions Quantifier, is as follows⁴:

Lifetime Cost Effectiveness (\$/short-ton reduced)
 Heavy Duty Trucks

Fiscal Year	Number of Vehicle	NO _x	PM _{2.5}	HC	CO	CO ₂
FY-2017	94	\$65,428	\$148,678	\$77,428	\$13,952	\$1,032
FY-2018	46	\$60,028	\$140,952	\$73,404	\$13,227	\$979

Lifetime emission reduction (short-ton reduced)
 Heavy Duty Trucks

Fiscal Year	Number of Vehicle	NO _x	PM _{2.5}	HC	CO	CO ₂	Fuel amount reduced (gal)
FY-2017	94	9.035	3.976	7.635	42.370	572.6	50,901
FY-2018	46	4.421	1.946	3.736	20.734	280.2	24,909

Project Partners

The Northeast Diesel Collaborative Puerto Rico Committee and its stakeholders have partnered for this project, among other agencies and organizations, including: The Asthma Program of the Puerto Rico Department of Health and the Graduate School of Public Health of the University of Puerto Rico.

Sustainability of State Program

For Puerto Rico State Clean Diesel Grant Program, balancing economic, environmental and community well-being in a manner that protects the needs of current and future generations is one of our goals. As part of this project, PREQB will support the mechanical efforts of DOC replacement and LRRT installation with an educational component. We will conduct meetings with state agencies and provide educational materials.

⁴ Estimates based on Class8 short haul combination with a remaining life estimate of 5 years. Assume tires installation will reduce 2% emissions due to fuel economy. Estimates for FY-17 corrected with after mentioned information.



Quality Assurance and Quality Control

PREQB will perform systematic monitoring and evaluations of the various aspects of the project to guarantee that the activities and the reports occur in a timely manner. Evaluation of vehicles will be performed before selection and after equipment installation by a mechanic contracted by PREQB.

Basic requirements for procurement

The Uniform Grant Guidance (UGG) Procurement Standards are designed to ensure that purchases are made at a reasonable price in a fair and openly competitive way. You must also document your procurement decisions in a manner that will ensure that the transaction has met Federal requirements. Prior to use our contract or procurement process system, PREQB will evaluate if they meet the minimum standards of the UGG. PREQB will follow the UGG requirements to conduct our procurements in accordance with the minimum UGG requirements even if your own procurement system has less stringent standards.

Itemized Project Budget

Budget Category	FY-2017		FY-2018	
	EPA Allocation	Voluntary Match (if applicable)	EPA Allocation	Voluntary Match (if applicable)
1. Personnel	\$10,747	\$10,747		\$-
2. Fringe Benefits	\$1,181.50	\$1,181.50		\$-
3. Travel	\$232.50	\$232.50	\$450	\$-
4. Supplies	\$1,575.00	\$1,575.00	\$4,170	\$-
5. Others	\$188,905.50	\$188,905.50	\$240,200	\$-
6. EPA Match (DOC)	\$118,229.00	\$ -		\$-
7. Program Income	\$ -	\$ -	\$ -	\$ -
8. Contract**	\$29,700	\$29,700	\$30,600	
9. Total Direct Charges	\$350,975	\$232,746	\$275,420	\$-
10. Indirect Charges	\$3,712	\$3,712	\$0	\$-
Grand Total	\$354,687	\$236,458	\$275,420	\$-

* EPA match used for DOC acquisition.

** Include installation contract, unit inspection contract and storage contract.



BUDGET NARRATIVE

Project Budget

For FY-17 and FY-18 a last predetermine indirect cost rate of 30.10% is included.

Explanation of Budget Framework

1. Personnel

Since the grants will be consolidated, personnel and marginal benefits for FY-2018 will be zero, since expenses were already calculated in FY-2017

Position	FY-2017			FY-2018		
	% of Time	EPA	Territory	% of Time	EPA	Territory
Luis Sierra Acting Manager Air Quality Area	1 %	\$379	\$379	0%	\$ -	\$-
Brenda I. Vélez Medina Office System Administrator	1 %	\$172	\$172	0 %	\$ -	\$-
Yolanda Martínez Quezada Environmental Emergency Specialist	40 %	\$9,995	\$9,995	0 %	\$ -	\$-

2. Fringe Benefits

Category	FY 2017			
	FY-2017		FY-2018	
	EPA	Territory	EPA	Territory
Social Security (7.65%)	\$407	\$407	\$-	\$-
PR State Fund (3.65%)	\$ 388	\$ 388	\$-	\$-
Health Ins.	\$ 387	\$ 387	\$-	\$-

3. Travel

Category	FY-2017		FY-2018	
	EPA	Territory	EPA	Territory
Meetings, Seminars and Inspection diem	\$232.50	\$232.50	\$450	\$-



4. Supplies

Category	FY-17		FY-18	
	EPA	Territory	EPA	Territory
Office and Promo Supplies	\$1,500.00	\$1,500.00	\$4,170.00	\$ -
Materials and PPE	\$75	\$ 75	\$ -	\$ -

5. Others⁵

Category	FY-17		FY-18	
	EPA	Territory	EPA	Territory
DOC Devices	\$35,663.50	\$35,663.50	\$92,000	\$-
DOC Devices EPA Match	\$118,229.00	\$-	\$-	\$-
LLRT	\$150,400.00	\$150,400.00	\$147,200	\$ -
Public Notice	\$1,500.00	\$1,500.00	\$-	\$-
Shipping and handling	\$500	\$500	\$1,000	\$-
Provided training expenses	\$1,114.50	1,114.50	\$-	\$-
Other expenses	\$505.50	\$505.50	\$-	\$-

* Contains contract for unit inspections, equipment installation and storage

6. EPA Match

Fiscal Year 2017 EPA match is in DOC Devices EPA Match category, under Others expenses.

7. Program Income

No program income expected.

⁵ According to PREQB acquisition process rules, supplies over \$500 are classified as equipment. Therefore, retrofits are listed as equipment.



8. Contractual

Category	FY-17		FY-18	
	EPA	Territory	EPA	Territory
Contract Services*	\$29,700	\$29,700	\$30,600	\$-

* Include inspection after and before retrofit installation, equipment and supplies storage and installation.

9. Direct Charges

Category	FY-17		FY-18	
	EPA	Territory	EPA	Territory
Direct Charges	\$354,880.50	\$236,651.50	\$275,420	\$-

10. Indirect Charges

Category	FY-17		FY-18	
	EPA	Territory	EPA	Territory
Indirect Charges	\$3,532.00	\$3,532.00	\$-	\$-

Match Requirements

Puerto Rico Environmental Quality Board will provide fiscal management and program oversight to ensure that the goals are achieved in a timely manner. PREQB will also provide technical project management for the procurement process and oversight of new device installation in the vehicles.