State of New Jersey
Department of Environmental Protection

CHRIS CHRISTIE
*Governor*

KIM GUADAGNO
*Lt. Governor*

BOB MARTIN
*Commissioner*

# PROJECT SOLICITATION

## OVERALL GOAL

The State of New Jersey, as a potential beneficiary of the Trust established pursuant to the national Volkswagen settlement, intends to use its allocation from the mitigation trust to efficiently implement projects that reduce oxides of nitrogen (NOx) emissions in a cost effective and technically feasible manner. The implemented projects must meet the criteria of the Consent Decree. New Jersey is issuing this solicitation for project ideas to ensure a broad range of project ideas are considered. Additional opportunities will be provided for public input during the upcoming months.

Submissions must be received by January 31, 2018 and must contain all the information outlined in the "Project Proposals" section of this document.

## ELIGIBLE PROJECTS

A general summary is below. Click here for comprehensive list and associated definitions.

| Source Category | Emission Reduction Strategy | Allowed Expenditure Amount |
|---|---|---|
| **1. Class 8 local freight trucks & port drayage trucks** | Repower and replacement | Up to 40% for repower with diesel or alternative fuel or up to 75% (up to 100% if government owned) for repower with electric. Electric charging infrastructure costs are eligible expense.<br><br>Up to 25% for replacement with diesel or alternative fuel or up to 75% (up to 100% if government owned) for electric replacement. Electric charging infrastructure costs are eligible expense. |
| **2. Class 4-8 school bus, shuttle bus or transit bus** | Repower and replacement | Same as row 1 |
| **3. Freight switching locomotives** | Repower and replacement | Same as row 1 |
| **4. Ferries/Tugs** | Repower | Same as row 1 |
| **5. Oceangoing vessels** | Shorepower | Up to 25% for shore side infrastructure if non-government owned (up to 100% if government owned) |

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|---|---|---|
| **6. Class 4-7 local freight trucks** | Repower and replacement | Same as row 1. |
| **7. Airport ground support equipment** | Repower and replacement | Up to 75% to repower or replace with electric (up to 100% if government owned). Electric charging infrastructure costs are eligible expense. |
| **8. Forklifts and Port Cargo Handling Equipment** | Repower and replacement | Up to 75% to repower or replace with electric (up to 100% if government owned). Electric charging infrastructure costs are eligible expense. |
| **9. Electric vehicle charging stations or hydrogen fueling stations for light duty vehicles only** | | Up to 100% to purchase, install and maintain infrastructure if available to public at *government owned* property.<br>Up to 80% to purchase, install and maintain infrastructure if available to public at *non-government owned* property.<br>Up to 60% to purchase, install and maintain infrastructure at a workplace or multi-unit dwelling that is not available to the general public.<br>Up to 33% to purchase, install and maintain infrastructure for publicly available hydrogen dispensing that is high volume or up to 25% for lower volume. |

**PROJECT PROPOSALS**

Proposals must be submitted by close of business on January 31, 2018. Electronic submittals are preferred and should be sent to VWComments@dep.nj.gov however paper submittals will also be accepted and should be sent to:

NJDEP
Division of Air Quality
Mail code 401-02E
Trenton, NJ 08625-0420
Attn: VW Settlement

All proposals must contain the following information; incomplete applications will not be considered. If your project is selected, you may be contacted for additional detailed information. Send questions to VWComments@dep.nj.gov

To enter information electronically use Adobe Reader

**CONTACT INFORMATION**

| | |
|---|---|
| Organization Name | Nuvera Fuel Cells, LLC |
| Organization Address | 129 Concord Road, Bldg. 1 |
| City, State Zip Code | Billerica, MA 01821 |
| Contact Person | Gus Block |
| Title/Position | Director of Corporate Development |
| Phone | (978) 852-5774 |
| E-mail | gblock@nuvera.com |

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|---|---|
| **PROJECT NAME** | Fuel Cell Electric Top Loaders for Ports |

**PROJECT CATEGORY OR CATEGORIES** (choose from 1-9 in "Eligible Projects" section above)

1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☑ 9☐

**PROJECT PRIORITY** Priority # of proposals

If submitting more than one proposal, what is the sponsor's priority of this proposal?

**PROJECT BUDGET**

Provide total estimated project budget, include source and amount of cost share if applicable.

$7,976,250

**PROJECT DESCRIPTION** (Briefly describe the project by completing the following questions)

Geographic area where emissions reductions will occur? Port of NY/NJ

Estimated size of population benefitting from the emission reductions? 2,370,000

Estimated useful life of the project? 5 years

Number of engines/vehicles/vessels/equipment included in the project? 5

Estimated emission benefits should be expressed in tons per year (TPY) of emission reduced for NOx and for PM 2.5 over the lifetime of the project. Identify methodology used.

Estimated NOx benefits? 0.97 TPY

Methodology Used? California ARB Mobile Source Div. Methodology

Particulate matter (PM 2.5) benefits? 0.03 TPY

Methodology Used? California ARB Mobile Source Div. Methodology PM10

Will the project benefit one or more communities that are disproportionately impacted by air pollution? If so, please describe.

The project will benefit communities in the proximity of the Port of NY/NJ, since the port is a concentrated source of diesel emissions.

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|---|
| Project partners, if any?<br>Hyster-Yale Group, a global equipment manufacturer; and an industrial gas supplier to provide renewable hydrogen fuel. |
| Explain how the project will provide cost effective and technically feasible emission reductions. Cost effectiveness should be expressed in dollars per ton per year of emissions reduced for NOx and for PM 2.5.<br>$853,886 per ton of NOx produced per year at 0.515 capital recovery factor (2 years)<br>$27,466,666 per ton of PM10 produced per year at 0.515 capital recovery factor (2 years)<br>$80,518 per ton of NOx produced per year at 0.111 capital recovery factor (10 years)<br>$2,590,000 per ton of PM10 produced per year at 0.111 capital recovery factor (10 years) |
| Estimated timeframe for implementation? Include a project timeline that identifies start and end dates, as well as the timeframe for key milestones.<br>Established hydrogen fueling infrastructure: 3Q19<br>Deliver first fuel cell top loader: 4Q19<br>Deliver remaining top loaders: 1H20 |
| Demonstrated success in implementing similar projects?<br>Nuvera began delivering fuel cell systems for lift trucks in 2006. Hyster-Yale Group acquired Nuvera Fuel Cells in 2014 and now offers fuel cell forklifts to commercial customers. |
| If your proposed project involves alternative fuels, provide a demonstration of current or future plans to provide adequate refueling infrastructure.<br>Hydrogen refueling capability is now available from multiple industrial gas suppliers. Air Liquide is currently constructing 12 hydrogen stations in NJ/NY/CT/RI/CT for on-road fuel cell automobiles. Approximately 150 kg/day of hydrogen would be required for this project and this is well within the capabilities of current providers.<br><br>Nuvera currently manages a project at the Mass. Bay Transit Authority operating a fuel cell transit bus. |
| Has your organization been approved to receive and expend any other grant funds related to this project? If so, please provide details.<br>No. |
| Please provide any additional information that supports this project.<br>There is worldwide interest in reducing emissions from seaports. Therefore, port equipment manufacturers such as Hyster-Yale Group are developing zero-emissions alternatives to diesel-powered equipment. See the supplemental information provided below for further details. |

Two additional pages have been provided as supplemental space to answer any of the questions above.

Realizing zero emissions power solutions for large freight management equipment at seaports is a significant challenge. The expected autonomy between refueling and the inherent energy consumption of these large vehicles requires a considerable amount of energy be stored on board the vehicle.

The highly demanding and varied duty cycles in these intense operations make refueling time a critical factor in cost of ownership for the operator. These and other technical limitations have obstructed the electrification, even with advanced battery technology, of equipment such as container handlers ("top loaders"), large forklifts, and yard tractors.

Hyster-Yale Group, along with its subsidiary Nuvera Fuel Cells, intends to offer hydrogen fuel cell power options across their full line of lift trucks, including the largest top loaders and reach stackers. The benefits of hydrogen as "portable electricity" are the enabler for electricity to supplant mechanical powertrains for these large vehicles. We also believe that as markets for the technology continue to expand, customers of these larger machines will begin to realize cost of ownership advantages compared to existing internal combustion engine vehicles and battery electric vehicles.

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