2018

State of Connecticut Mitigation Plan under Volkswagen 2.0L and 3.0L Vehicle Partial Consent Decrees, Appendix D

Connecticut Department of Energy and Environmental Protection

Table of Contents

I. BACKGROUND

On October 25, 2016, a Partial Consent Decree[1] was approved between the United States, California, and the defendants to address installation and use of emissions control defeat device software (defeat devices). The defendants were the Volkswagen (VW) Corporation and its subsidiaries. The software was installed in approximately 500,000 model year 2009 through 2015 VW and Audi branded diesel vehicles, of which an estimated 11,911 vehicles were sold/leased in Connecticut. The use of the defeat devices has resulted in increased emissions of nitrogen oxide (NOx) in Connecticut and throughout the United States. NOx significantly contributes to the formation of ground level ozone which negatively impacts the respiratory system and cardiovascular health. One of the goals of the Partial Consent Decree is to offset the excess NOx emissions from these vehicles. On December 20, 2016, the United States and California filed a second partial settlement with VW addressing vehicles containing 3.0 liter diesel engines (the "3.0 liter partial settlement"), which was approved on May 17, 2017.[2] On January 11, 2017, the United States and California filed the third partial settlement with VW addressing civil penalties and injunctive relief to prevent future violations (the "third partial settlement"), which was approved on April 13, 2017.[3] On September 9, 2017, the United States and California filed with VW an unopposed motion for court approval of the finalized Environmental Mitigation Trust Agreement for State Beneficiaries (Mitigation Trust Agreement), which was approved on October 2, 2017. [4]

The Partial Consent Decrees, among other actions contained within, established an Environmental Mitigation Trust (Trust) which will provide funds to all fifty states, the District of Columbia, Puerto Rico and federally recognized tribes, to implement actions to counter the air quality impacts of the excess NOx emissions resulting from the use of the defeat devices. The Mitigation Trust Agreement sets forth the final details of the mitigation trust requirements. The initial allocation to the State of Connecticut (State) under the Trust is approximately $51.6 million dollars; the 3-liter settlement added another $4.1 million for a total allocation of $55.7 million. The Mitigation Trust Agreement establishes a process for states and tribes to receive the funds and requires the development of this mitigation plan, which summarizes how the State intends to use its allotted funds. The Mitigation Trust Agreement also requires the Connecticut Department of Energy and Environmental Protection (DEEP) to develop a plan for public review and comment describing the types of mitigation actions or projects eligible for funding under the Trust along with a general description of the expected ranges of emission benefits.

[1]Partial Consent Decree: http://www.ct.gov/deep/lib/deep/air/mobile/vw/2016-10-25_-_VW_Partial_Consent_Decree-web.pdf

[2] Second Partial Consent Decree: https://www.epa.gov/sites/production/files/2016-12/documents/30literpartialconsentdecree.pdf

[3] Third Partial Consent Decree: https://www.epa.gov/sites/production/files/2017-01/documents/vwthirdpartial-cd.pdf

[4] The Environmental Mitigation Trust Agreement for State Beneficiaries: http://www.ct.gov/deep/lib/deep/air/mobile/vw/2017-10-02_-_State_Beneficiary_Trust_Agreement.pdf

II. CONNECTICUT'S AIR QUALITY CHALLENGES

On April 11, 2016, the Environmental Protection Agency (EPA) made a final determination that Connecticut failed to attain the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS). Based on 2012-14 ambient air monitoring data,[5] Connecticut was reclassified from marginal to moderate nonattainment and must achieve significant reductions in NOx emissions in order to attain the ozone NAAQS. Figure 1 (below) shows the distribution of NOx emissions across the State's economic sectors, with the transportation sector being the major contributor.

Transportation emissions significantly impact the State's air quality and attainment designation, being the source of 67% of the State's NOx emissions; and 41% of its greenhouse gas (GHG) emissions (see Figures 1 and 2).

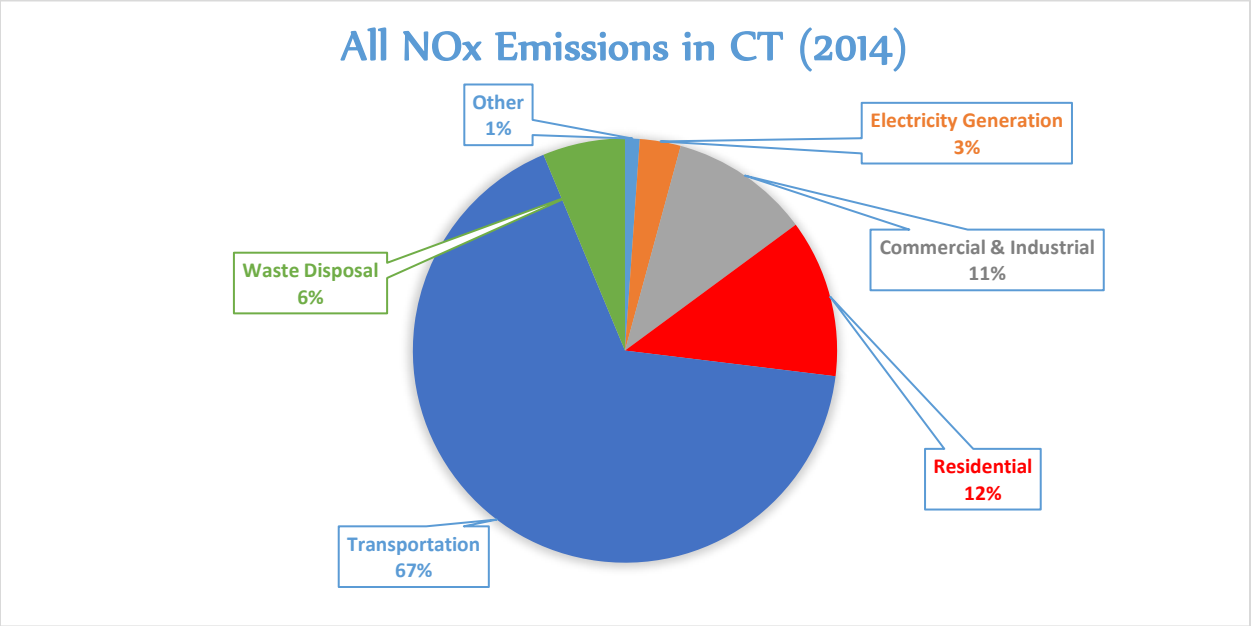

Figure 1: Sources of NOx in Connecticut (2014 NEI)

[5] EPA Final Rule: Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, And Reclassification of Several Areas for the 2008 Ozone National Ambient Air Quality Standards, April 11, 2016 https://www.epa.gov/sites/production/files/2016-04/documents/20160411fr.pdf

A. NOx and OZONE

NOx reacts in the atmosphere, in the presence of sunlight, to form ground-level ozone (smog). The adverse health effects of ozone and diesel exhaust are well documented.[6,7] These studies show that ozone can irritate the respiratory system and affect lung function, even in otherwise healthy individuals. Exposure to high levels of ozone can enhance people's sensitivity to asthma-triggering allergens such as pollen and dust mites, and can also increase the frequency and severity of asthma attacks.[8]

Ozone levels in Connecticut are also significantly affected by the transport of ozone, as well as NOx and other ozone precursors, from upwind states. Predominant weather patterns combined with Connecticut's location relative to upwind emissions sources makes the state particularly vulnerable to levels of pollution transport that at times exceed the 8-hour ozone NAAQS.

In addition to transported air pollution, NOx emissions from mobile sources also negatively impact air quality and public health in the State. While upwind air pollution has slightly diminished somewhat in recent years, Connecticut, being a thruway between New York and Boston, continues to experience increases in vehicular activity. Vehicle miles traveled in the State has increased by more than 2.1% over the last two years.[9]

B. CLIMATE CHANGE

There are many observed changes to the climate, such as rising temperatures and shifting snow and rainfall patterns, linked to increasing levels of GHGs in our atmosphere.[10] For example, research by the Connecticut Institute for Resilience and Climate Adaptation at the University of Connecticut projects that greenhouse gas emissions will lead to significant sea level rises in Long Island Sound that will impact Connecticut by the middle of this century.[11] In 2008, Connecticut passed the Global Warming Solutions Act, which established GHG targets of at least ten percent below the level emitted in 1990 by 2020 and at least eighty percent below the level emitted in 2001 by 2050.[12] To that end, Connecticut continues to address climate change in

---

[6] EPA Health Assessment Document for Diesel Engine Exhaust (2002): https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=29060

[7] Diesel Exhaust and Health: Remarkable Progress, Lingering Concerns (2012): https://www.epa.gov/sites/production/files/2014-09/documents/2012_09_okeefe.pdf

[8] Health Effects of Ozone in the General Population: https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population

[9] Federal Highway Administration Travel Monitoring, Traffic Volume Trends: https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm

[10] Climate Change Indicators: Greenhouse Gases: https://www.epa.gov/climate-indicators/greenhouse-gases

[11] O'Donnell, James, "Sea Level Rise and Coastal Flood Risk in Connecticut: An Overview, https://circa.uconn.edu/wp-content/uploads/sites/1618/2017/09/ExecSummarySeaLevelRise_J_ODonnell_Sept-2017-1.pdf

[12] IPCC (Intergovernmental Panel on Climate Change). 2013. Climate change 2013: The physical science basis. Working Group I contribution to the IPCC Fifth Assessment Report. Cambridge, United Kingdom: Cambridge University Press.www.ipcc.ch/report/ar5/wg1

a meaningful way by identifying new strategies and developing and supporting forward thinking policies and legislation.

GHG emissions from transportation, primarily carbon dioxide, have increased nationwide by about 17% since 1990[13], and will continue to rise unless there is substantial reduction in the use of fossil fuels. Approximately 41% of Connecticut's GHG emissions are emitted by mobile sources (see Figure 2).

Transportation-related pollution is a function of vehicle emissions, the carbon content of transportation fuel, and vehicle miles traveled. Transportation fuel and emissions are the most likely of these three elements to be impacted by mitigation strategies. As such, promoting the use of zero or low emitting vehicles, providing a platform to facilitate the adoption of clean fuels and cleaner vehicles, and improving transportation system efficiencies will be a significant part of any efforts to mitigate both GHG and NOx emissions.

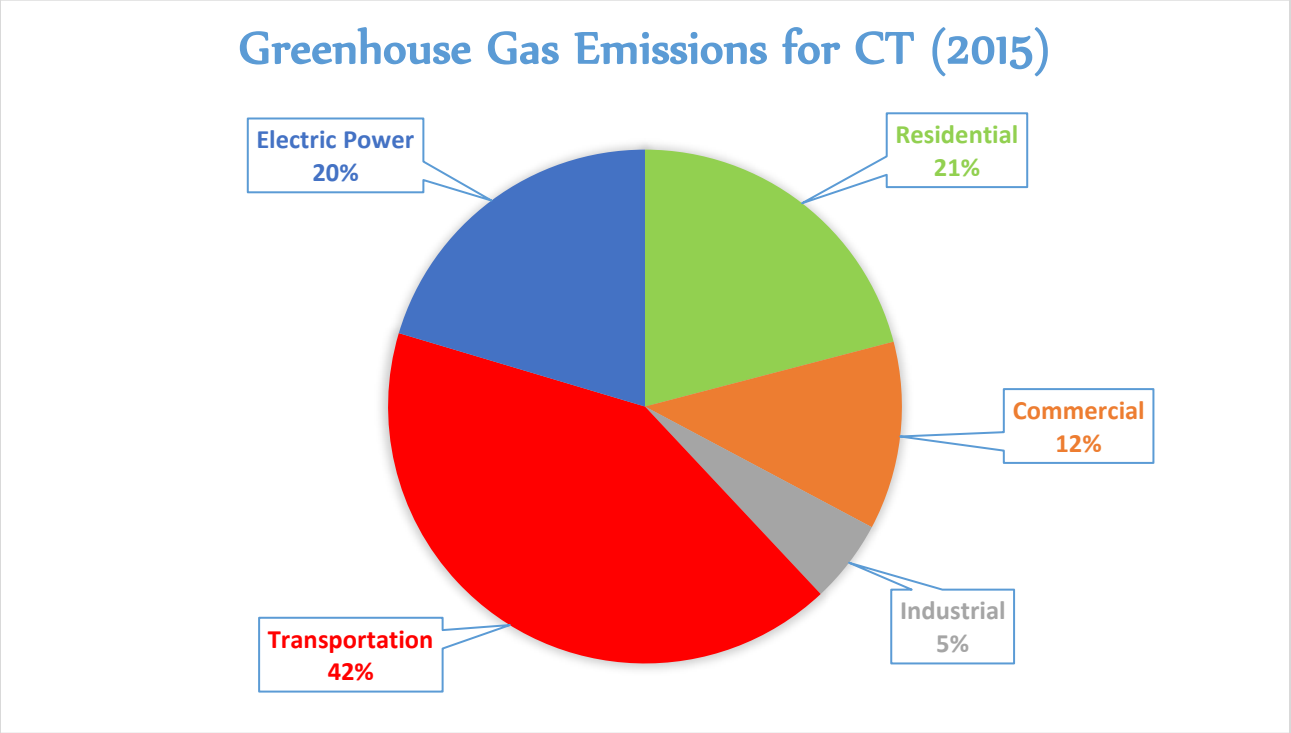

Figure 2: Distribution of Connecticut's Greenhouse Gas Emissions (EIA)

[13] Sources of Greenhouse Gas Emissions: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

III. MITIGATION PLAN: OVERVIEW and GOAL

In accordance with the Mitigation Trust Agreement, all designated Beneficiaries[14] must create a mitigation plan summarizing how the allocated funds will be used. Specifically, the plan must describe:

- The State's overall goal for use of the funds,
- The categories of eligible mitigation projects[15] anticipated to be appropriate to achieve the stated goals and the assessment of the allocation of funds anticipated to be used for each type of eligible mitigation project,
- What consideration will be given to the potential beneficial impact of selected eligible mitigation projects on air quality in areas that bear a disproportionate share of the State's air pollution burden,
- The anticipated ranges of emission benefits that would be realized by implementation of the eligible mitigation projects identified, and
- The State's process for seeking and considering public input on the Plan.

In keeping with the above criteria, DEEP has developed this plan to provide the public with insight into its vision and overall approach to utilizing the mitigation funds allocated under the Trust. The primary goal of the State's Plan is to improve and protect ambient air quality by reviewing, analyzing and implementing eligible mitigation projects that will:

- Improve air quality by achieving significant and sustained cost effective reductions in NOx emissions,
- Expedite deployment and widespread adoption of zero emission and near-zero emission vehicles and engines, and
- Support statewide energy, environmental and economic development goals while also taking into account environmental justice considerations associated with each proposed eligible mitigation project.

The State has the discretion to adjust its objectives and specific spending strategy when necessary to achieve the Plan's goals and the State will update the Plan as necessary. Any updates to the Plan will be submitted to the Trustee and be made available on DEEP's public webpage addressing all VW settlement related issues, which can be found at www.ct.gov/deep/vw.

[14] All governmental entities initially allocated funds under the Environmental Mitigation Trust must apply to become a Beneficiary of the Trust. See Appendix D, Section 4.0 of the Partial Consent Decree

[15] Categories of eligible mitigation projects are designated in Appendix D-2 to the Partial Consent Decree, which is attached to this Mitigation Plan as Appendix D.

IV. AVAILABLE FUNDING AND ELIGIBLE APPLICANTS

On October 2, 2017, the Mitigation Trust Agreement, upon court approval, became effective. On October 18, 2017, DEEP submitted its *Certification for Beneficiary Status Under Environmental Mitigation Trust Agreement* to the Trustee, the United States and the court overseeing the VW action. On January 29, 2018, the Trustee filed a Notice of Beneficiary Designation under the VW Diesel Emissions Environmental Mitigation Trust for State Beneficiaries designating Connecticut as a Beneficiary under the Trust.[16] As such, Connecticut is now eligible to receive $55,721,169 (1.90% of the $2.9 billion made available to states and Tribes) from the Trust as specified in Appendix D to the Mitigation Trust Agreement.

Both non-government and government entities are eligible to apply for funding to implement eligible mitigation projects. Funding allocation requests are limited per the terms of the Mitigation Trust Agreement. Project funding will be awarded through an open and transparent process based on sound analytics that will comply with all applicable state and federal procurement requirements.

DEEP will maintain and make publicly available all documentation submitted in support of each funding request and all records supporting all expenditures of eligible mitigation project funds.

V. CATEGORIES OF ELIGIBLE MITIGATION PROJECT TYPES

The State will ensure that projects ultimately funded support the Plan's goal. This goal will be achieved by establishing priorities and associated objective criteria to be used to guide the planning, solicitation, and project selection processes. The categories of eligible mitigation projects deemed appropriate to achieve the stated goal in this Plan are based on mobile NOx emissions sources in the State (see Figure 3).

[16]Notice of Beneficiary Designation, January 29, 2018, http://www.ct.gov/deep/lib/deep/air/mobile/vw/2018-01-29_-_VW_Beneficiary_Designation.pdf

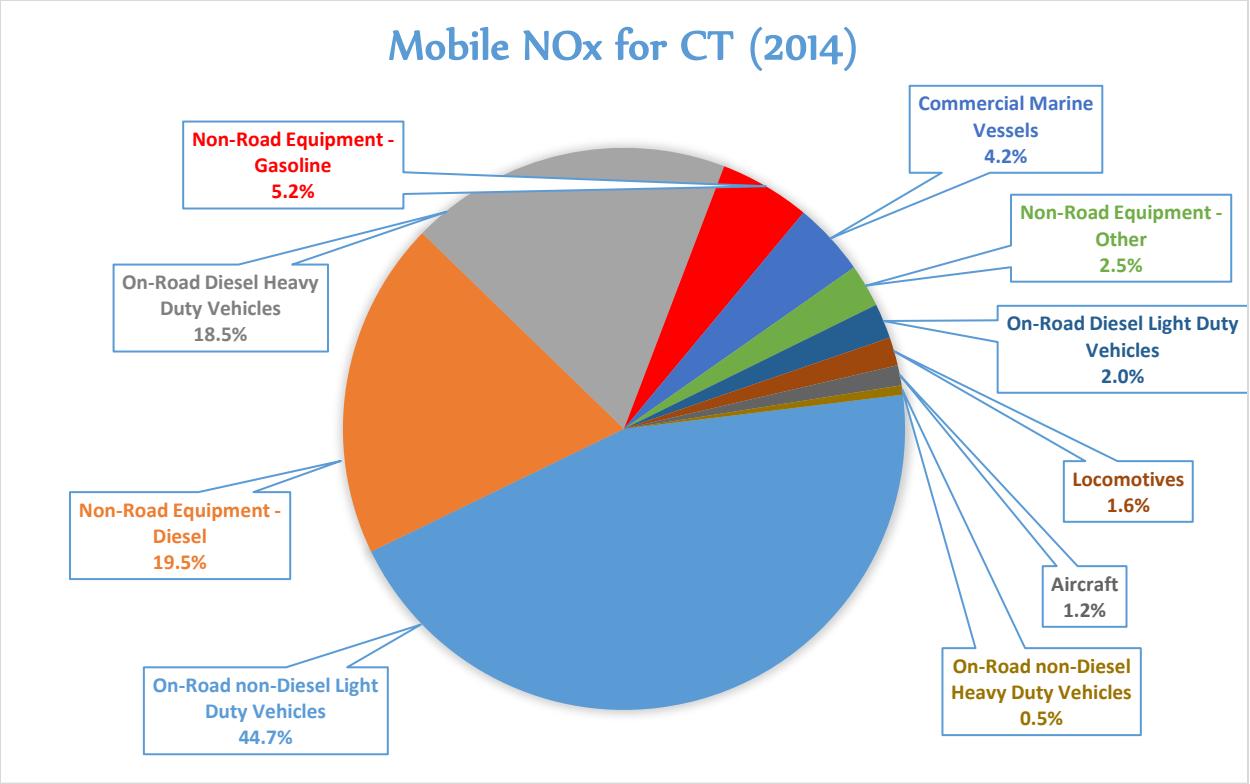

Figure 3: Breakdown of Mobile NOx Emissions in Connecticut (2014 NEI)

A. FUNDING PRIORITIES

The funding priorities in this Plan are based on:

- The assessment of current NOx emissions from mobile sources (see Figures 3 and 4),
- Demographic and locational data (see Figure 5),
- Anticipated NOx emissions reductions or offsets from mobile sources, current and anticipated ground level ozone nonattainment areas,
- Existing air quality improvement measures and programs in Connecticut,
- Equity considerations for the distribution of the funds across the State,
- Capacity issues for certain sectors to implement programs in a timely and efficient manner,
- Consistency with statewide energy, environmental, and economic development goals; and
- Environmental justice considerations and other relevant factors.

These funding priorities, include, but are not limited to:

- Projects scaled to achieve the greatest NOx emission reduction or offset per dollar

invested (i.e., capital cost effectiveness in dollars/ton),

- Transformative projects that promote other statewide energy, environmental, and economic development goals[17] while also taking into account environmental justice considerations,
- Government and non-government entities with demonstrated experience and existing administrative and programmatic structure in place for implementing diesel reduction or offset projects,
- Projects in areas that receive a disproportionate quantity of air pollution from diesel fleets such as but not limited to ports, rail yards, truck stops, airports, terminals, and bus depots,
- Projects with verified funding or leveraged funding that exceeds the minimum required cost share,
- Projects that can be implemented within eighteen months of the award date; and
- Projects located in nonattainment areas, or areas with historical issues concerning compliance with federal air quality standards.

It is important to note that the above list consists of preferential funding criteria and should not be considered as eligibility criteria. Funding priorities are subject to change based on public input, new or supplemental air quality or other data, and other applicable factors.

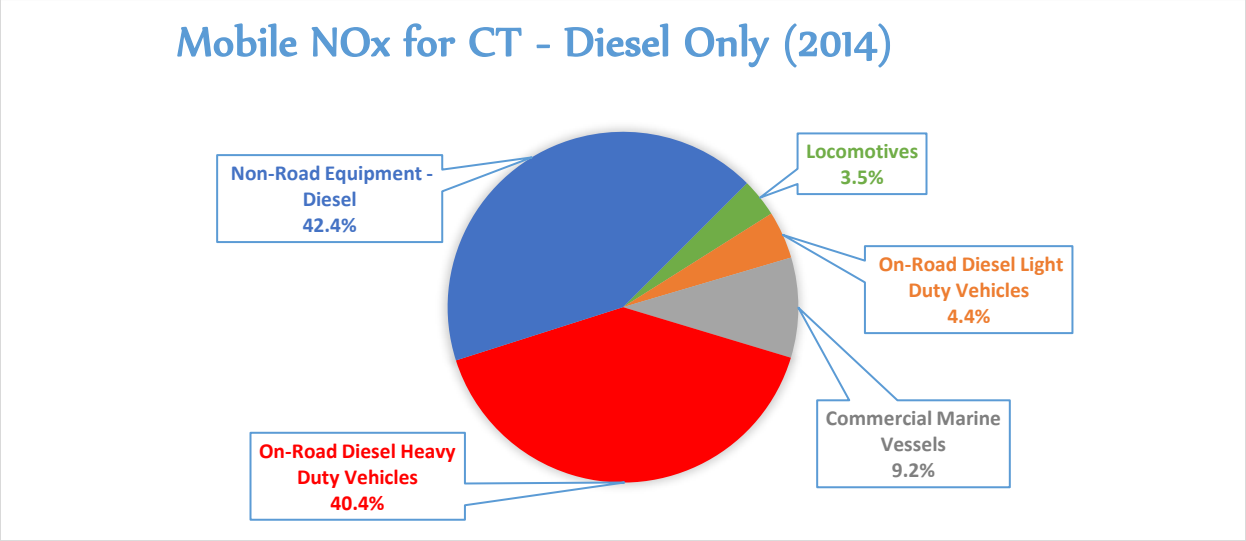

Figure 4: Diesel Mobile NOx Emissions in Connecticut (2014 NEI)

[17] For example, see the 2013 Comprehensive Energy Strategy for Connecticut and its draft 2017 successor at http://www.ct.gov/deep/cwp/view.asp?a=4405&Q=500752&deepNav_GID=2183 and the Draft Clean Fuels / Clean Vehicles Plan at http://www.ct.gov/deep/lib/deep/air/siprac/2014/zev_implementation_plan_meeting.pdf.

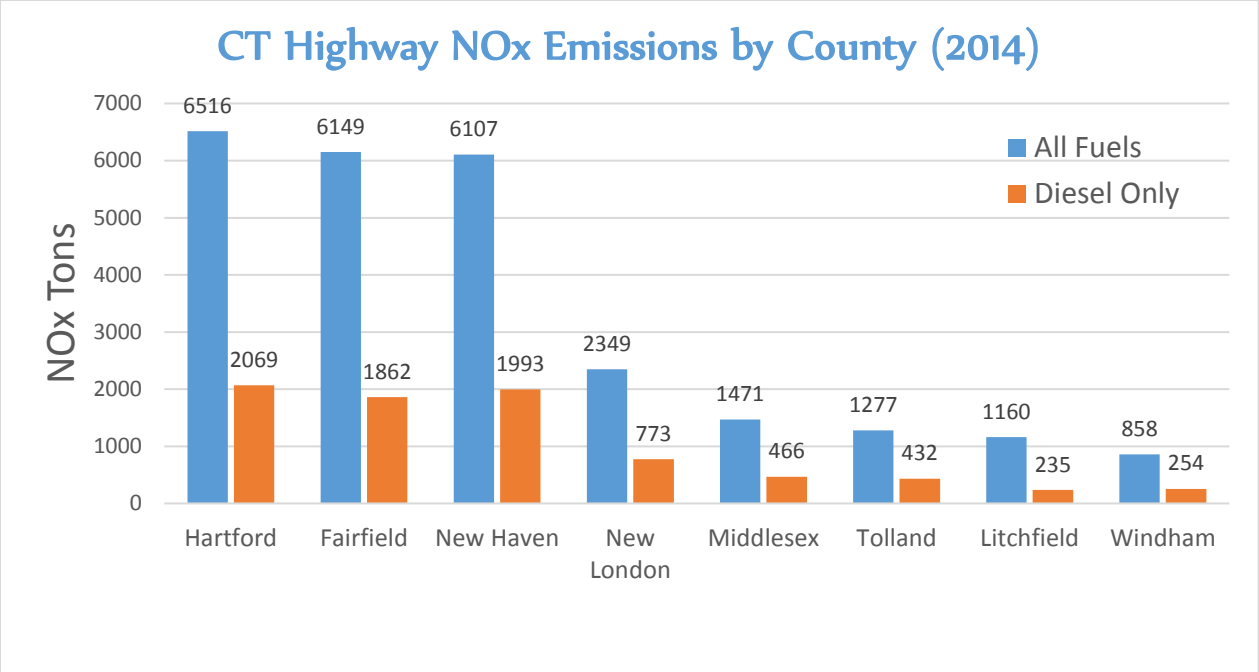

Figure 5: Connecticut Highway NOx Emissions by County (2014 NEI)

B. FUNDING ALLOCATIONS

Considerations informing the State's funding allocation approach for eligible mitigation projects, include but are not limited to: sources of mobile NOx emissions, sources of projected NOx emissions reductions, options to maximize funding allowed for the deployment of zero emission vehicle supply equipment and possible projects not specifically enumerated in Appendix D-2 of the Mitigation Trust Agreement but eligible under the Diesel Emission Reduction Act (DERA).

DEEP fully supports the State's ongoing commitments to the wide-scale deployment of electric vehicles. Appendix D-2 of the Mitigation Trust Agreement authorizes the use of up to 15% of the allocated Trust funds on the costs necessary for, and directly connected to, the acquisition, installation, operation and maintenance of new light duty zero emission vehicle supply equipment; DEEP intends to utilize the maximum amount allowed for this purpose. However, under Appendix D-2, Trust funds shall not be made available or used to purchase or rent real estate, other capital costs (e.g., construction of buildings, parking facilities, etc.) or general maintenance (i.e., maintenance other than of the supply equipment).

DEEP intends to exercise the DERA Option, utilizing Trust funds to match its State DERA allocation to allow for a greater variety of eligible projects. The rest of the allocated funds will be used for the remaining categories of eligible projects outlined in the Mitigation Trust Agreement that are aligned with the funding priorities presented in this Plan. Expenditures from the Trust can only be used for eligible non-government and government mitigation projects

that are specified in Appendix D-2 of the Mitigation Trust Agreement.[18] The specific Trust expenditures under this Plan, will depend on the proposals received, the degree to which proposed projects meet or exceed solicitation criteria, and additional factors. It is anticipated that all recipients of Trust funds will be required to provide a minimum level of cost sharing, but DEEP reserves the right to allocate the maximum allowed under the Mitigation Trust Agreement for a proposed project of exceptionally high quality and merit that advances State goals and objectives. Notwithstanding the program expenditure levels for each project category below, preference will be given to eligible project proposals that exceed the minimum required cost share.

The following information provides detail on the categories of eligible project types and anticipated benefits. To encourage the widest diversity of proposals, DEEP does not intend to prioritize any category of eligible mitigation projects beyond the allocations for light duty zero-emission supply equipment and DERA. For more details on eligible mitigation projects, see Appendix D to this document.

i. On-Road Medium and Heavy Duty Vehicles

On-road heavy duty vehicles emitted 7,501 tons or 19% of all mobile source NOx emissions in the State during 2014.

Eligible Mitigation Project Types: Class 8 Local Freight Trucks and Port Drayage Trucks (Large Trucks), Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Buses), and Class 4-7 Local Freight Trucks (Medium Trucks).

Eligible trucks include 1992 - 2009 engine model years; and eligible buses include 2009 engine model year or older. For Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year trucks at the time of the proposed Eligible Mitigation Action, eligible trucks and buses shall also include 2010-2012 engine model year vehicles.[19] Eligible trucks and buses may be repowered with any new diesel or alternate fueled engine or all-electric engine, or may be replaced with any new diesel or alternate fueled or all-electric vehicle, with the engine model year in which the mitigation action occurs or one engine model year prior.

Expenditures for Non-Government Owned Eligible Large and Medium Trucks, and Eligible Buses:

- Up to 40% of the cost of a repower with a new diesel or alternate fueled[20] engine, including the costs of installation of the engine,

[18] See Appendix D to this document.
[19] Medium and heavy duty trucks and buses, including school buses, MY 2010 and newer, are not eligible for this program in Connecticut.
[20] As defined in Appendix B of this document.

- Up to 25% of the cost of a new diesel or alternate fueled vehicle,
    - The only exception to this limit is for eligible drayage trucks, which are eligible for up to 50% of the cost of a new diesel or alternate fueled vehicle
- Up to 60% of the cost of a repower with a new all-electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new all-electric engine; and
- Up to 60% of the cost of a new all-electric vehicle, including charging infrastructure associated with the new all-electric vehicle.

Expenditures for Government Owned Eligible Large and Medium Trucks, and Eligible Buses:

- Up to 65% of the cost of a repower with a new diesel or alternate fueled engine, including the costs of installation of such engine,
- Up to 65% of the cost of a new diesel or alternate fueled vehicle,
- Up to 65% of the cost of a repower with a new all-electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new all-electric engine; and
- Up to 65% of the cost of a new all-electric vehicle, including charging infrastructure associated with the new all-electric vehicle.

Expected Benefits include, but are not limited to:

- Tons of pollution reduced over the lifetime of the engines/vehicles, specifically NOx, and GHGs,
- Net reduction in gallons of diesel fuel and/or other fossil fuels used,
- Improved ambient air quality and human health in communities located in nonattainment areas, areas with historical air quality issues, or in areas that bear a disproportionate share of the air pollution burden, as well as benefits to the local economy; and
- Reduced public exposure to diesel particulate matter, which EPA has classified as a likely human carcinogen.

ii. Non-Road Equipment

Non-road equipment emitted 10,671 tons or 27% of all mobile source NOx emission in the State during 2014.

Eligible Project Types: Airport Ground Support Equipment, Forklifts and Port Cargo Handling Equipment.

Eligible airport ground support equipment includes Tier 0, Tier 1, or Tier 2 diesel powered airport ground support equipment; and uncertified, or certified to 3 grams per brake horsepower-hour or higher emissions, spark ignition engine powered airport ground support equipment. Eligible forklifts include reach stackers, side loaders, and top loaders with greater than 8000 pounds lift capacity. Eligible port cargo handling equipment includes rubber-tired gantry cranes, straddle carriers, shuttle carriers, and terminal tractors, including yard hostlers and yard tractors that operate within ports.

Eligible Airport Ground Support Equipment, Forklifts or Port Cargo Handling Equipment may be repowered with all-electric engines, or may be replaced with a similar units in an all-electric form.

Expenditures for Non-Government Owned Eligible Airport Ground Support Equipment, Forklifts and Port Cargo Handling Equipment:

- Up to 60% of the cost of a repower with a new all-electric engine, including the costs of installation of the engine, and charging infrastructure associated with the new all-electric engine, and
- Up to 60% of the cost of new all-electric equipment, including charging infrastructure associated with the new all-electric airport ground support equipment, forklifts or port cargo handling equipment.

Expenditures for Government Owned Eligible Airport Ground Support Equipment, Forklifts and Port Cargo Handling Equipment:

- Up to 65% of the cost of a repower with a new all-electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new all-electric engine; and
- Up to 65% of the cost of new all-electric equipment, including charging infrastructure associated with the new all-electric airport ground support equipment, forklifts or port cargo handling equipment.

Expected Benefits include, but are not limited to:

- Tons of pollution reduced or avoided over the lifetime of the engines/vehicles, specifically NOx, and GHGs,
- Net reduction in gallons of diesel fuel and/or other fossil fuels used,
- Improved ambient air quality and human health in communities located in nonattainment areas, areas with historical air quality issues, or in areas that bear a disproportionate share of the air pollution burden, as well as benefits to the local economy; and

- Reduced public exposure to diesel particulate matter, which EPA has classified as a likely human carcinogen.

iii. Commercial Marine Vessels

Commercial marine vessels emitted 1664 tons or 4.2% of all mobile source NOx emissions in the State during 2014.

Eligible Project Types: Ferries, Tugs, and Shorepower for ocean-going vessels.

Eligible ferries or tugs include unregulated, Tier 1, or Tier 2 marine engines. Eligible ferries and/or tugs may be repowered with any new Tier 3 or Tier 4 diesel or alternate fueled engines, or with all-electric engines, or may be upgraded with an EPA Certified Remanufacture System or an EPA Verified Engine Upgrade.

Eligible marine shorepower includes systems that enable a compatible vessel's main and auxiliary engines to remain off while the vessel is at berth, and include cables, cable management systems, shore power coupler systems, distribution control systems, and power distribution.

Expenditures for Non-Government Owned Eligible Ferries, Tugs and Shorepower for Ocean-going Vessels:

- Up to 40% of the cost of a repower with new diesel or alternate fueled (e.g., CNG, propane, hybrid) engines, including the costs of installation of the engines for ferries or tugs,
- Up to 60% of the cost of a repower with new all-electric engines, including the costs of installation the engines and associated charging infrastructure; and
- Up to 25% for the costs associated with the shore-side system, including cables, cable management systems, shore power coupler systems, distribution control systems, installation, and power distribution components.

Expenditures for Government Owned Eligible Ferries, Tugs and Shorepower for Ocean-going Vessels:

- Up to 65% of the cost of a repower with new diesel or alternate fueled (e.g., CNG, propane, hybrid) engines, including the costs of installation,
- Up to 65% of the cost of a repower with new all-electric engines, including the costs of installation of the engines and associated charging infrastructure; and
- Up to 65% for the costs associated with the shore-side system, including cables, cable management systems, shore power coupler systems, distribution control systems, installation, and power distribution components.

Expected Benefits include, but are not limited to:

- Tons of pollution reduced or avoided over the lifetime of the engines/vehicles, specifically NOx, and GHGs,
- Net reduction in gallons of diesel fuel and/or other fossil fuels used,
- Improved ambient air quality and human health in communities located in nonattainment areas, in areas with historical air quality issues, or in areas that bear a disproportionate share of the air pollution burden, as well as benefits to the local economy, and the welfare of residents in such communities; and
- Reduced public exposure to diesel particulate matter, which EPA has classified as a likely human carcinogen.

iv. Locomotives

Locomotives emitted 639 tons or 1.6% of all mobile source NOx emission in the State during 2014.

Eligible Project Types: Freight Switchers

Eligible freight switchers include pre-Tier 4 switcher locomotives that operate 1000 or more hours per year.

Eligible Freight Switchers may be repowered with any new diesel or alternate fueled or all-electric engines (including generator sets), or may be replaced with any new diesel or alternate fueled or all-electric (including generator sets) freight switchers that are certified to meet the applicable EPA emissions standards as published in the code of federal regulations for the engine model year in which the eligible freight switcher mitigation action occurs.

Expenditures for Non-Government Owned Freight Switchers:

- Up to 40% of the cost of a repower with new diesel or alternate fueled (e.g., CNG, propane, hybrid) engines or generator sets, including the costs of installation,
- Up to 25% of the cost of a new diesel or alternate fueled (e.g., CNG, propane, Hybrid) freight switcher,
- Up to 60% of the cost for a repower with new all-electric engines, including the costs of installation of the engine and associated charging infrastructure, and
- Up to 60% of the cost for new all-electric freight switchers, including associated charging infrastructure.

Expected Benefits include, but are not limited to:

- Tons of pollution reduced or avoided over the lifetime of the engines/vehicles, specifically

NOx, and GHGs,

- Net reduction in gallons of diesel fuel and/or other fossil fuels used,
- Improved ambient air quality and human health in communities located in nonattainment areas, in areas with historical air quality issues, or in areas that bear a disproportionate share of the air pollution burden, as well as benefits to the local economy, and the welfare of residents in such communities; and
- Reduced public exposure to diesel particulate matter, which EPA has classified as a likely human carcinogen.

v. Light Duty Zero Emission Vehicle Supply Equipment

Light duty vehicles emitted 18,385 tons or 47% of all mobile source NOx emission in the State during 2014. Infrastructure investments would expedite the deployment of zero emission vehicles (ZEVs) and help offset emissions from the largest source of NOx emissions in State.

Eligible Project Types: Eligible light duty ZEV supply equipment includes:

- Light duty electric vehicle supply equipment: Level 1, Level 2 or fast charging equipment (or analogous successor technologies) that is located in a public place, workplace, or multi-unit dwelling and is not consumer light duty electric vehicle supply equipment (i.e., not located at a private residential dwelling that is not a multi-unit dwelling); and
- Light duty hydrogen fuel cell vehicle supply equipment: hydrogen dispensing equipment capable of dispensing hydrogen at a pressure of 70MPa (or analogous successor technologies) that is located in a public place.

Expenditures for Eligible Light Duty ZEV Supply Equipment:

- Up to 65% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that will be available to the public at a government owned property,
- Up to 60% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that will be available to the public at a non-government owned property,
- Up to 50% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that will be available at a multi-unit dwelling or a workplace but not to the general public,
- Up to 33% of the cost to purchase, install and maintain eligible hydrogen fuel cell vehicle supply equipment capable of dispensing at least 250 kilograms per day (kg/day) that will be available to the public; and
- Up to 25% of the cost to purchase install and maintain eligible hydrogen fuel cell vehicle

supply equipment capable of dispensing at least 100 kg/day that will be available to the public.

Expected Benefits include, but are not limited to:

- Tons of pollution reduced over the lifetime of the zero emissions vehicle supply equipment, specifically NOx and GHGs,
- Net reduction in diesel or gasoline used,
- Improved ambient air quality and human health in communities located in nonattainment areas, in areas with historical air quality issues, or in areas that bear a disproportionate share of the air pollution burden, as well as benefits to the local economy, and the welfare of residents in such communities; and
- Reduced public exposure to diesel particulate matter, which EPA has classified as a likely human carcinogen.

vi. Diesel Emission Reduction Act (DERA) Option

Approximating the tons or percentage of NOx emitted under this category is slightly more difficult because emissions will vary based on the actual source or project type. However, potential air quality benefits are weighted heavily in the selection of projects to be funded through the State's DERA program and such benefits are calculated for all of the projects implemented with State DERA funds.

The State DERA program has a wider range of eligible projects than those covered by the Trust. Potential diesel reduction mitigation projects not specifically enumerated in Appendix D-2 of the Trust but eligible for funding through DERA include but are not limited to:

- Replacement, engine replacement (repowering), or engine upgrades of long haul locomotives,
- Replacement or repowering of agricultural or construction equipment,
- Replacement, repowering or engine upgrades of commercial marine vessels not limited to tugboats and ferries,
- Idle reduction technologies, including auxiliary power units, truck stop electrification (TSE) and shorepower,
- Retrofit technologies for diesel vehicles or equipment; and
- Replacement or repowering of transport refrigeration units (TRUs).

This is not an exhaustive list of source types and projects eligible to apply for funding under the State Clean Diesel Grant Program.[21] Any source type applying for grant funding will be subject to the requirements of the State DERA Program, including but not limited to EPA project eligibility, location-based preferential criteria, eligibility of expenditures for project administration, and cost-share availability. It should be noted that DEEP's locational criteria for evaluating and selecting projects for State DERA funding have consistently addressed location in environmental justice communities, which are characterized, in part, by disproportionate air pollution impacts, and nearness to diesel transportation hubs, including ports, rail yards and highways. Consideration is also given for projects that are consistent with state energy and clean transportation policies and to applicants with anti-idling policies.

Connecticut has elected to exercise the DERA Option and use Trust funds to match its 2017 State DERA allocation of $235,798.00. The match qualifies DEEP for a bonus from EPA of $118,899.00 yielding a total of $589,495.00 to be used to fund and administer DERA projects in fiscal year (FY) 2017. DEEP also reserves the opportunity to use VW Trust funds to match future State DERA allocations, should they be approved by Congress. Diesel reduction mitigation projects selected for FY 2017 State DERA funding include:

- Early replacement of one heavy duty sewer pumping truck;
- Idle reduction technologies, specifically, sixty TSE units (a.k.a. shorepower systems) for hybrid electric TRUs (e-TRUs);
- Early replacement of twelve diesel TRU trailers with hybrid electric TRU trailers; and
- Early replacement of two private school buses.

Expected Benefits include, but are not limited to:

- Tons of pollution reduced or avoided over the lifetime of the engines/vehicles selected for the 2017 State DERA projects: 6.28 tons NOX, and 1.245 tons fine particulate matter,
- Net reductions, or avoidance, in diesel fuel use: a minimum reduction of 692 gallons per year from the TRU and TSE projects alone,
- Improved ambient air quality and human health in communities located in nonattainment areas, in areas with historical air quality issues, or in areas that bear a disproportionate share of the air pollution burden, as well as benefits to the local economy, and the welfare of residents in such communities: The selected idle reduction TSE/TRU project is located adjacent to residential areas near both Bradley Airport and two interstate highways, satisfying all of the locational priorities, and

[21] For more information, see EPA's FY 2017 State Clean Diesel Grant Program Information Guide at https://www.epa.gov/sites/production/files/2017-02/documents/fy17-state-program-guide-2017-02.pdf.

- Reduced public exposure to diesel particulate matter, which EPA has classified as a likely human carcinogen.

This Plan is not a solicitation for projects. As such, the Plan does not include detail on the competitive application or project selection process.

VI. ANTICIPATED BENEFITS

There are many benefits to be realized from the implementation of the mitigation projects outlined in this Plan. Some of those benefits are outlined below.

A. ENVIRONMENTAL BENEFITS

The retrofit, repower, or replacement of eligible vehicles and equipment provides a wide range of emission benefits based on many variables, including the type of vehicle or engine replaced, the initial age of the engine, and the engine's duty cycle and power rating. Based on current EPA exhaust emission standards for NOx[22]:

- Heavy duty highway vehicles may provide up to 96% reduction in NOx emissions per vehicle, based on replacing a model year 1992 engine with a model year 2007 engine,
- Non-road equipment replacements, depending on the type of equipment and engine power rating, may provide between 20% and 95% reduction in NOx emissions for each engine,
- Locomotives may provide up to 89% NOx reduction per engine, based on replacing the oldest (Tier 0) engine with the newest (Tier 4) engine,
- Replacement or repower of a ferry or tug engine may provide up to 80% NOx reduction for each vessel, and
- Shorepower projects may reduce all NOx exhaust emissions from many ocean-going vessels.

These anticipated ranges of emission benefits were used to inform the Plan's funding priorities, categories of eligible mitigation projects, and funding allocation considerations for each category of eligible mitigation projects. It is important to note that the range of emission benefits mentioned above are for individual engines and actual NOx emissions reductions will vary based on the type of projects received for funding consideration, and the eligible mitigation projects ultimately funded. However, in order to achieve the goal of the Plan, it is a priority to fund sizeable and/or transformative projects designed to achieve the greatest emission reduction for the dollar (i.e. capital cost effectiveness in dollars/ton).

[22]EPA exhaust emission standard data: https://www.epa.gov/emission-standards-reference-guide

B. ENERGY AND ECONOMIC BENEFITS

Eligible mitigation projects, including the retrofit, repower or replacement of eligible vehicles along with the installation and operation of light duty zero emission vehicle supply infrastructure, will provide a wide range of energy and economic benefits to the State. As a result, this Plan intends to require the examination of both the energy and economic impacts of any proposed expenditures as these actions will support other important state interests.

Connecticut continues to make progress in reducing emissions of criteria pollutants and greenhouse gases while simultaneously supporting a clean energy economy. Connecticut has deployed a regulatory and institutional framework to support continued progress in reducing emissions and decarbonizing key sectors of the economy including buildings, electric generation and transportation. In conjunction with the state's continued efforts to advance clean energy deployment, the State has focused investments in light duty zero emission vehicles and associated infrastructure. In the future, these investments may support the potential to capture increased benefits to the grid as well as the local electric distribution system.

Eligible mitigation projects specified in Part V of this Plan will provide energy and economic benefits to the State that may include, but not be limited to, increased sales of both diesel vehicles, non-road equipment and other eligible equipment along with associated tax revenue generated from non-governmental purchases. Increased equipment efficiency will reduce operation and maintenance costs and allow the redirection of these cost savings into other areas of the state's economy.

The State intends to allocate the maximum allowed to light duty zero emission vehicle infrastructure to support the deployment of electrified transportation options and further enhance the State's efforts to reduce greenhouse gas emissions from the transportation sector. Cost savings associated with reduced spending on petroleum can then be redirected to other areas within the State's economy. Proposals for eligible mitigation projects under the light duty zero emission vehicle infrastructure Plan will also be evaluated to determine the extent to which they leverage additional resources to support transformative technological changes and further the energy and economic benefits of the State and whether they also provide a firm base of support for emerging fuel cell or other alternative fuel transportation technologies.

APPENDICES

APPENDIX A: ELIGIBLE MITIGATION PROJECT ADMINISTRATIVE EXPENDITURES

For any eligible mitigation project, Trust funds can be used for the actual administrative expenditures associated with implementing such eligible mitigation project, but not to exceed 15% of the total cost of such eligible mitigation project. The 15% allotment includes the aggregated amount of eligible administrative expenditures incurred by the Beneficiary and any third-party contractors. These eligible administrative expenditures include the following:

- Personnel, including costs of employee salaries and wages, but not consultants;
- Fringe Benefits, including costs of employee fringe benefits such as health insurance, Federal Insurance Contributions Act (FICA), retirement, life insurance, and payroll taxes;
- Travel, including costs of mitigation project-related travel by program staff, not including consultant travel;
- Supplies, including tangible property purchased in support of the mitigation project that will be expensed on the "Statement of Activities," such as educational publications, office supplies, etc.;
- Contractual, including all contracted services and goods except for those charged under other categories such as supplies, construction, etc.; this includes contracts for evaluation and consulting services and contracts with sub-recipient organizations;
- Construction, including costs associated with ordinary or normal rearrangement and alteration of facilities; and
- Other costs including insurance, professional services, occupancy and equipment leases, printing and publication, training, indirect costs, and accounting.

APPENDIX B: PUBLIC COMMENT PERIOD ACTIVITIES

DEEP will solicit and compile public comments on this draft final mitigation plan. Responses to comments will be posted on DEEP's VW webpage at www.ct.gov/deep/vw. Changes resulting from submitted comments will be incorporated into the final Plan.

APPENDIX C: CONNECTICUT'S DRAFT VW ENVIRONMENTAL MITIGATION PLAN: SUMMARY OF COMMENTS RECEIVED

Contents

Connecticut's Draft VW Environmental Mitigation Plan:

Summary of Comments Received

On January 18, 2017, the Connecticut Department of Energy and Environmental Protection (DEEP) posted a draft of its Beneficiary Mitigation Plan (Plan) on its VW Settlement website.[23] DEEP's draft Plan sought to provide the public with insight into its vision and overall approach for utilizing the mitigation funds allocated under the Trust. The primary goal of the State's Plan is to improve and protect ambient air quality by reviewing, analyzing and implementing eligible mitigation projects that will:

- Improve air quality by achieving significant and sustained cost effective reductions in emissions of nitrous oxides (NO_X);
- Expedite deployment and widespread adoption of zero emission and near-zero emission vehicles and engines; and
- Support statewide energy, environmental and economic development goals while also taking into account environmental justice considerations associated with each proposed eligible mitigation project.

Once the plan had been posted, DEEP published an informal request for comments on its VW website; the same information was sent via e-mail to stakeholders who had requested information on the settlement by signing up on DEEP's web site for electronic notification. Sixty-five written comments and questions[24] were submitted through the website before the comment period ended on March 6, 2017. In addition, on February 23, 2017, DEEP hosted a public informational session on the Plan at the headquarters in Hartford. Thirty-five individuals participated in the public session, of whom fifteen presented oral comments. Separately, DEEP staff fielded eleven questions from the audience.

Most of the commenters spoke to the need for DEEP to prioritize a particular technology listed in Appendix D-2 to the Mitigation Trust Agreement. As a result, the summarized comments are organized by types of technologies; these are listed in alphabetical order. Interspersed among the technology-based comments were comments on the overall program, which are summarized in subsection viii "General Comments."

i. Clean Diesel

DEEP received two written comments, and one comment presented at the informational session on February 23, that were primarily supporting the replacement or repowering of eligible trucks and equipment with Tier 4 diesel engines. Several commenters who were promoting other technologies also advocated for clean diesel programs.

[23] DEEP VW Settlement Information at: http://www.ct.gov/deep/vw

[24] The original comments can be found on the DEEP VW website at: http://www.ct.gov/deep/lib/deep/air/mobile/vw/VW_Settlement_-_Comments_Received.pdf

Cost Effectiveness: The primary argument in favor of clean diesel was that the technology is the most cost effective option for reducing NO_X emissions through replacing and repowering diesel vehicles and equipment. Putting an emphasis on cost effective clean diesel replacements would benefit small businesses and non-urban locations in the state.

Proven Technology: For heavy-duty applications that produce the greatest amount of pollution, notably locomotive, marine and construction equipment, commenters provided data supporting clean diesel as a proven replacement technology that yields high emission benefits when compared to other technologies.

Greater NO_X Reductions: All commenters in this group noted that Tier 4 diesel engines meet or exceed the U.S. Environmental Protection Agency's emission standards for heavy-duty on-road vehicles and non-road equipment. One commenter cited a 2012 Clean Air Task Force study concluding that replacing a diesel bus with a new, clean diesel bus yielded greater NO_X reductions than replacement with a new, compressed natural gas (CNG) bus.

Multiple Applications: Diesel-powered freight switchers, ferries and tugs represent industry sectors that are important, and should be considered for replacement or repower funding. Clean diesel commenters also supported shorepower technologies, which provide electric support to replace long-term diesel idling at ports and truck stops.

Supports Diesel Emissions Reduction Act (DERA) Option: Because clean diesel technologies can be applied to vehicles and equipment that are not eligible under the VW settlement but are eligible for DERA funding, a number of these comments include supporting the use of VW Settlement funds as matching funds for the DERA Option. Examples of DERA-eligible projects not included in Appendix D-2 of the settlement are construction equipment, agricultural equipment, marine applications (apart from ferries and tugboats), and diesel engine upgrades.

ii. Compressed Natural Gas (CNG)

Five comments were received primarily advocating for the use of mitigation funds for natural gas vehicles (NGVs) and CNG infrastructure. While most comments related to prioritizing this technology or specific applications thereof, there was a consistent theme of providing equitable funding for CNG technology and equitable selection criteria for potential projects from the public and private sectors.

Proven & Commercially Available: Commenters recommended that the highest levels of funding should be used to fund proven, commercially available, CNG technologies which have emissions well below the federal standard of 0.2 grams of NO_X per brake horsepower-hour (g/bhp-hr) and meet California's optional low NO_X or near-zero emissions standards. Funding focus areas were wide ranging and included 1) large diesel engine conversions to dual-fuel operation, 2) complete diesel to CNG engine replacements, 3) CNG school buses, 4) medium and heavy-duty trucks and 5) other high mileage fleets such as mass transit, para transit, and refuse fleets.

Equitable Funding for CNG & Electric: With regard to medium and heavy-duty trucks, there was concern that an electric truck replacement, which costs substantially more than a CNG truck with nearly the same life-cycle emissions, would receive up to 75% of the cost under our plan while a CNG truck replacement would only receive up to 25%. It was suggested that the funding percentage for both CNG trucks and electric trucks be the same at 25%. Based on vehicle costs, electric trucks would still be treated fairly and receive close to twice as much actual funding as a CNG truck if both were set to 25%.

Access to CNG Infrastructure: CNG infrastructure comments ranged from support of natural gas fueling stations to funding CNG vehicles in areas where fueling infrastructure already exists leveraging investments that have already been made. Commenters noted that CNG vehicles are an excellent choice if fueling infrastructure is near to the fleet garage facility. It was suggested that private-public partnerships be used to develop infrastructure needed for new locations.

iii. DERA Option for Emission Control and Idle Reduction Technologies

In addition to the clean diesel comments, which overlap the DERA Option, DEEP received one comment on diesel emission controls and six comments encouraging the use of VW funds as voluntary matching for the State DERA Option to promote idle reduction technologies. These applications are not eligible for funding under Appendix D-2 but are eligible under DERA. Some commenters were vendors and some were potential customers. Most recommended the integration of hybrid electric transportation refrigeration units (e-TRUs) or truck stop electrification (TSE) into Connecticut distribution centers and truck stops. Both technologies require electric infrastructure (a.k.a. shorepower connections) for operation. Another commenter promoted an electrification unit to reduce exhaust emissions from ambulances parked outside hospital emergency rooms.

Exhaust Controls (a.k.a. Retrofits): One commenter recommended that DEEP support funding high-quality particle exhaust filters for vehicles with large diesel engines. Retrofits are a cost-effective way of reducing emissions from older diesel engines.

Benefits of e-TRUs: Conventional TRUs are diesel-powered and run for long periods of time to keep cargo chilled while trucks are parked at distribution centers. Since such businesses are located adjacent to highways, these compound the emissions from the transportation corridors in the state. Trucks carrying refrigerated cargo can plug their e-TRUs into shorepower stations at the distribution centers, eliminating the diesel idling emissions. Cost savings accrue from replacing the diesel fuel consumed during long periods of idling with electricity. Noise pollution is also greatly reduced by the use of e-TRUs, an important feature where residences are nearby. Distribution centers are often located in areas disproportionately impacted by air pollution, so these benefits are consistent with that goal of VW's Mitigation Program.

Benefits of TSE: Two commenters noted that a significant amount (40% was cited) of engine run time for long-haul heavy-duty diesel trucks consists of idling while drivers fulfill their mandatory 10-hour sleep requirements. The idling engines provide electricity for heating and cooling the cab and for small appliances like televisions and refrigerators. They noted that TSE

systems provide cost-effective electric power for cab comfort and amenities, eliminating the NO_X and $PM_{2.5}$ emissions from long-term idling and reducing the amount of diesel fuel consumed.

Benefits of Ambulance Stop Electrification: Ambulances frequently idle outside of hospitals to maintain temperature controls so that sensitive equipment is in a mission-ready state. One commenter stated that this idling disproportionately impacts sensitive patients in the hospital and recommended the use of matched DERA funding to install its kiosks outside hospital emergency rooms so that ambulances can plug in and maintain or use their equipment while reducing patient exposure to idling emissions.

iv. Electric Vehicles (EVs) & Equipment

Airport Ground Support Equipment (GSE): DEEP received a detailed comment strongly encouraging DEEP and the State to maintain GSE electrification as an option in its mitigation plan and to ensure an effective and efficient process for disbursement of Trust funds for this highly beneficial eligible mitigation action. A second commenter expressed general support for deploying all-electric powered GSE equipment as long as it makes economic and operational sense; replacement of older electric equipment that is not maintaining required operational efficiency and presents safety concerns should be considered.

Commitment to Emission Reduction: Noting that airlines have worked to reduce emissions through cost effective projects that have included electrification of airport GSE, one commenter proposed that VW funding be geared toward GSE electrification projects. By reducing emissions at Bradley International Airport, the commenter continued, these projects would improve air quality in Hartford County, which has the highest highway NO_X emissions in the state.

Programmatic Infrastructure and Experience: Member airlines have experience and programmatic structures in place to effectively implement GSE electrification projects to reduce emissions. They also have experience with the Federal Aviation Administration's Voluntary aircraft Low Emissions (VALE) Program,[25] California's Carl Moyer Program, and have implemented projects effectively in other locations. VALE funding has allowed member airlines to convert equipment at airports in Arizona, New Mexico, Washington, Texas, Florida, and California among others. Securing funding from the VW Mitigation Trust for GSE electrification will allow the airlines to realize similar air quality benefits for Connecticut.

Partnerships for Charging Infrastructure: Member airlines recognize that as non-government entities they may have to share the capital because electric GSE cannot be deployed without supporting infrastructure, which is owned and operated by the airport. As a result, airlines envision partnering with airport operators in integrated GSE electrification projects that will enable cost-effective investments in electric GSE.

[25] Information on the Voluntary Airport Low Emissions Program can be found at https://www.faa.gov/airports/environmental/vale/

Electric Buses: DEEP received five written comments focused on electric buses and charging infrastructure and several other commenters included electric buses among their funding priorities. On-road heavy-duty diesel vehicles, such as buses and trucks, are accountable for 13% of Connecticut's 2014 NO_X pollution. Many comments recommended that money from the VW settlement should be used to cover some or all the cost of purchasing electric buses and installing bus charging stations. This funding could be made available to municipal transit agencies and private companies to defer the higher capital cost of these vehicles.

Proven technology, Easily Integrated into Connecticut Fleets: Commenters cited many national and international examples of fleets of school, transit, and shuttle buses that have been successfully converted to or replaced by electric buses. There were also several examples of transit operators within Connecticut that have been working with Connecticut Department of Transportation (DOT) to initiate an electric bus pilot project. It was also noted that federal funding sources have been identified that might be available to help leverage funding; some pre-procurement work has been completed.

Large Emission Reductions: Several commenters noted that electric buses have the potential to drastically reduce lifetime NO_X, CO_2 and other greenhouse gas emissions because, as compared to the lifetime emissions of fossil-fueled engines and vehicles, an all-electric bus produces no tailpipe emissions. Many references, tables and graphs were provided showing how electric buses compare to other fuels and technologies used in buses. Commenters also cited the numbers of people who ride through and/or live near transit hubs and are in close proximity to air pollution emitted by buses that are idling or in transit. Several commenters remarked that electric buses could help alleviate pollution in communities located in nonattainment areas, which bear a disproportionate share of the air pollution burden caused by high concentrations of diesel particulate matter from buses and cars.

Economically Beneficial and Energy Efficient: Commenters noted that the lifecycle cost of an electric bus is far less, as compared to a diesel bus, when procurement, lifetime fuel and maintenance costs are included. Tables, graphs and examples were provided to support the savings calculations. Commenters also noted that electricity prices do not fluctuate on international markets, as the prices of other fuels do, and thus provide fleet owners with better information for future investment planning efforts.

Commenters also noted that electric buses are a viable option for businesses, institutions and governments that are looking for opportunities to incorporate more energy efficient sustainable transportations options into their fleets, both to save money and to meet their sustainability goals.

Supported by State and Regional Planning Efforts: Commenters pointed to Governor Malloy's encouragement of efforts to attain Connecticut's clean air goals by providing a more reliable, cleaner and cheaper transportation system. Connecticut's Air Toxics

Control Regulation of 1986 and the 1990 Clean Air Act Amendments[26] also direct the state to work on lowering pollution from mobile and other sources.

Several commenters also recognized that Connecticut is a signatory on the Zero Emission Vehicle Memorandum of Understanding (MOU)[27] and that under the MOU the state is obligated to support and facilitate the successful commercialization of zero emission vehicles (ZEVs) and efforts to maximize the electric miles driven by these vehicles. In addition, commenters noted that electric bus proposals are often a part of current Regional Plans of Conservation and Development and have been found, through pre-scoping work, to garner support from various public and private organizations.

California Zero-Emission Truck and Bus Program:[28] One commenter referenced the California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP) as a potential model that Connecticut could replicate using VW Trust funds. The Program encourages manufacturers of zero-emission technology to partner with transit agencies and compete for project funding.

Electric Buses as a Transformational Marketing Tool: Several commenters stated that because transit buses are used in rural, suburban and urban areas, they represent the best opportunity to increase consumer awareness of the benefits of electrification. Bus transit accounts for the largest percent of public transportation trips and total passenger miles. Millions of people rely on transit buses to get to school, work and for recreation. Electric buses would provide a platform for people to see, experience and interact with the technology on a daily basis, thus potentially speeding up EV market transformation.

Include Electric Bus Charging Infrastructure: Electric buses require chargers to operate and, due to the fixed itineraries, bus depots and/or common intersection points where buses cross would be good locations to install chargers. The buildout of electric bus infrastructure may also lead to the incorporation of electric buses in more transit agency fleets in the future. One commenter noted that there is currently available charging technology that will allow buses and cars to charge at the same charger, thus increasing the potential usage of a charger and accelerating light duty EV adoption.

Heavy-Duty EVs: Four commenters prioritized replacing heavy-duty diesel vehicles with electric equivalents. Three supported heavy-duty (Class 4-8) trucks and one encouraged the deployment of electric school buses. Heavy-duty EVs have been identified as a significant means of addressing transportation and air quality issues; hybrid-electric technologies are also said to offer an ideal suite of attributes for heavier loads and higher utilization rates of the medium-duty sector. Replacing or repowering heavy-duty diesel vehicles with zero emission

[26] Information on these and other Connecticut efforts to control air toxics can be found on DEEP's website at http://www.ct.gov/deep/cwp/view.asp?a=2684&q=322230&depNav_GID=1619

[27] Multi state Zero-Emission Vehicle Programs Memorandum of Understanding was entered into by Connecticut and seven other states on October 24, 2013; it can be found on DEEP's website at http://www.ct.gov/deep/lib/deep/air/zeroemissionvehicle_mou.pdf

[28] The California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP) is currently in the process of being implemented. Information is available at https://www.arb.ca.gov/msprog/aqip/hvip.htm

transportation, they noted, will provide reductions in the greatest sources of NO_X emissions in Connecticut. One of the propane proponents also remarked that Class 4-7 electric trucks would be an excellent choice, once they are deployed in sufficient quantities, and would greatly benefit from VW funding because of their premium cost, which can be twice as much as a propane powered vehicle.

Reductions from the Largest NO_X Sources: Emphasizing heavy-duty diesel would concentrate funding for projects based on the largest sources of statewide NO_X emissions including on-road heavy-duty diesel vehicles, non-road diesel equipment, commercial marine vessels and locomotives. The commenters urge the prioritization of funding through allocations based on the diesel-generated sources of NO_X emissions, dedicating the largest amount for on-road diesel projects (one commenter recommended dedicating 60%) and the remainder to address non-road, locomotive, and marine projects.

Benefits to Areas Disproportionately Burdened with Air Pollution: Heavy-duty trucks and transit buses operate in Connecticut's population centers and along key corridors, such as I-84, I-91, and I-95, contributing to the undue burden on urban residents in these areas. Replacing heavy-duty diesel trucks and buses with electric equivalents would provide targeted benefits to these neighborhoods. One commenter recommended setting a minimum threshold requirement (e.g., "75% of mileage must be accrued with Connecticut's nonattainment counties") to directly address the state's need to fund projects in communities that bear a disproportionate share of diesel pollution. Electrified Class 5, 6, and 8 on-road trucks also create benefits for the overall environment and for the truck operators.

Expand Definition to Include Heavy-Duty Non-Road Freight Handling Trucks: Terminal trucks are heavy-duty, class 8 trucks that move cargo containers within logistics yards, around the clock, with more hourly usage that the on-road semi tractors going between states. Class 8 diesel terminal trucks, used mostly off road, can be repowered as 100% electric vehicles to meet DOT standards. Terminal trucks should be included for funding as "Class 8 Local Freight Trucks and Port Drayage Trucks (Large Trucks)" both on and off highway and as "Cargo Handling Equipment," both on and off highway.

Expand Operational Definition to Include All Logistics Hubs: Terminal trucks are used in many sites, not just "ports." They should be allowed to be funded at any site where used (e.g. railroad, distribution center, manufacturing plant, etc.). A broader definition would better serve state interests, reducing harmful emissions in non-attainment areas and disadvantaged communities. As an example, this commenter cites California's Goods Movement Program, which defines eligible Cargo Handling equipment to include any "existing diesel yard truck" operating "at a seaport (port), intermodal railyard, or freight facility." This general language allows for broad inclusion resulting in greater emissions reductions.

Heavy-Duty Hybrid-Electric Vehicles: One commenter promoted the benefits of repowering heavy-duty diesel vehicles with hybrid-electric technology. Hybrid-electric engines can cost-effectively reduce harmful emissions and can be quickly installed on

new or existing vehicles. Allowing funds to be used for new gasoline-fueled vehicles equipped with hybrid technologies can result in superior cost-effectiveness and emission reduction benefits. Replacing an existing diesel vehicle with a gasoline-hybrid vehicle can more effectively "right size" the horsepower and torque suitable to the application, and reduce emissions across the spectrum of pollutants.

Hybrid technology has high NO_X reducing cost-effectiveness, particularly if the definition of cost-effectiveness is expanded to address other attributes such as deployment time, cost for a medium duty vehicle, wells to wheels NO_X savings, infrastructure requirements and technology availability.

First Come-First Served Funding Mechanism: One commenter noted that replacing existing diesel trucks with all-electric models provides emissions reductions that are immediate and dramatic and requested that states adopt streamlined, first-come first-served funding mechanism. For vehicles and charging stations they recommend a point-of-sale discount program similar to Chicago's user friendly "Drive Clean Truck"[29] program. For infrastructure projects, a rolling approval process with pre-approved funding amounts/percentages was suggested.

Conversion Kits Can Economically Electrify School Buses: One commenter encouraged the use of cost-effective conversion kits to electrify school buses. Reducing children's exposure to diesel emissions was cited as a benefit. It was also noted that the short-haul transportation patterns of school buses are suitable for scheduling the necessary charging.

Advanced Technology Benefits of Heavy-Duty EVs: One manufacturer promoted technology and charging systems that are capable of transforming "vehicles into a mobile power plant capable of supporting first responders in emergency situations or utilities in power outages." Hybrid vehicles continue to integrate transformational transportation technology such as the cloud-based XL Link™ Connected Vehicle System, which comes with some heavy-duty EV hybrids.

Electric Vehicle Supply Equipment (EVSE) & EVs: The greatest number of comments in support of a technology were the twelve encouraging deployment of EVs and EVSE. Municipalities, businesses, public interest groups and individuals all advocated using the maximum allowance (15%) of VW funds for alternative fuel infrastructure and for the replacement of diesel vehicles with electric equivalents. They encouraged support for EVSE, especially fast charging on major vehicle corridors easily assessable to the public. Almost all of the EVSE supporters included statements in support of EVs, so this summary includes some arguments seen in the preceding sections.

Prioritize Heavy-Duty Vehicles: Many commenters stated that heavy-duty EVs should be a target as heavy-duty diesel makes up the largest portion of NO_X emissions of mobile

[29] Information on Drive Clean Chicago's Drive Clean Truck program can be found at: http://www.drivecleanchicago.com/CleanTruck/Default.aspx

sources in the state. Electrification of buses and freight trucks have the most potential for emissions reductions.

Prioritize EVs Over Other Technologies: Regarding other technologies, some commenters stated that funding electrification should be preferred over other alternative fuels such as propane or natural gas because emissions benefits of electrification are greater than those from other technologies. Electrification has significant budget-predictability advantage when the volatility in gas prices is taken into account.

Consider GHG Emission Benefits: Project selection should focus on GHG emission reductions as well as NO_X reductions.

Support EV Conversions: Grant funds should be used to convert vehicles to electric drives.

Prioritize Workplace Charging: Grants should be provided for charging infrastructure at workplaces. This could also incentivize workplaces to investigate and utilize better energy efficiency options such as solar power to provide additional emission reductions.

Regional Cooperation in Deployment Planning: One commenter was encouraging regional cooperation among Northeast states in planning the deployment of EVSE and other alternative fueling infrastructure, particularly along highways and transportation corridors.

v. Fuel Cell Electric Vehicles (FCEVs) & Hydrogen (H_2) Fueling

DEEP received five written comments from businesses and trade groups supporting the funding of FCEVs and H_2 fueling infrastructure. With regard to H_2 fueling infrastructure, it was pointed out that incentive support will be essential to support the high cost of the systems. One of the commenters also advocated making funding available for any and all of the eligible options listed in the Plan.

H_2 Fueling Infrastructure Network: Most of the commenters made the case for improving access to fueling infrastructure as a prime incentive for FCEV use in Connecticut. In the ZEV supply equipment category, DEEP should fund H_2 infrastructure projects, expanding the network of H_2 stations in the state. Private investment can be leveraged, funding H_2 stations in coordination with the private sector-funded network already being established by Air Liquide and its partners.

Production-Based Incentive: DEEP should offer a production based incentive that takes into account avoided emissions. Similar to California's Low Carbon Fuel Standard,[30] this would involve evaluating life cycle emissions and comparing GHG emissions for the fuel being used to conventional fuel and assigning a "carbon intensity value." For DEEP's program, a NO_X intensity factor can also be used in determining the production incentive.

[30] Information regarding California's Low Carbon Fuel Standard can be found at https://www.arb.ca.gov/fuels/lcfs/lcfs.htm.

FCEV Projects for Cargo-Handling and Ground Support: At least two commenters suggested that DEEP should expand the eligible options to include the funding of projects involving the replacement or repowering of diesel container handlers (cranes), forklifts and ground support equipment with FCEVs and fuel cell electric engines.

Proposed Selection Criteria: Several commenters suggested adding selection criteria that would promote funding of FCEV projects.

> **Economic Impacts:** DEEP should include an economic impact factor in the project selection criteria to help promote further growth to Connecticut's $600 million fuel cell industry.
>
> **"Zero Emission Miles Dispensed":** DEEP should give consideration to the driving miles provided by individual infrastructure projects and include a "zero emissions miles dispensed" factor in the project selection criteria. By giving added preference to those projects capable of dispensing greater zero emissions driving miles, NO_X reduction benefits can be maximized.

Support of Other Options and Public Awareness: Following a detailed discussion in support of FCEVs, one commenter encouraged DEEP to fund all the categories outlined in the plan, except freight switchers. The commenter also encouraged the implementation of a multi-stakeholder involved educational initiative to enhance awareness of the programs established.

vi. Propane

Eleven e-mails were received from commenters supporting the use of mitigation funds for propane (a.k.a. autogas) vehicles. Six of the eleven comments were identical form letters.

Benefits of Propane: Generally, it was noted that propane is a proven shovel-ready technology with a long track record as a clean, alternative fuel, which is not an experimental fuel. Propane infrastructure is already in place and will allow the immediate reduction of NO_X with the implementation of propane vehicles under the mitigation plan. Additional propane benefits include better return on investments, quieter rides, lower fuel costs, and alleviation of the maintenance and downtime issues associated with the emission control systems on diesel engines.

Funding Priorities & Reimbursements: Propane supporters suggested that funding priorities should be geared towards private fleets, companies and organizations rather than municipal and government vehicles, with the exception of school, shuttle and transit buses and that shuttle buses should be reimbursed by miles driven.

Propane Applications: Commenter support in this category separated into two groups: those who primarily favored the funding of propane buses and those who primarily favored the funding of medium duty trucks. There was some overlapping support for both categories but each group was distinct in preference.

Propane Buses: Replacement of diesel school buses was the number one priority for many commenters. It was noted that newest and most popular propane engines for school buses will be certified for NO_X emissions at 0.05 g/bhp-hr, which is 75% cleaner than today's cleanest diesel school buses and 99% cleaner than the dirtiest school buses operating in the state. Propane school buses offer a cost-effective strategy to reduce NO_X emissions and improve public health, especially in communities that have been disproportionately burdened by emissions from these vehicles. Shuttle buses and transit buses were also said to be excellent platforms that can use alternative fuels to immediately reduce significant amounts of NO_X.

Class 4-7 Medium Duty Trucks: Others commented that focusing on Class 4 – 7 vehicles and incentivizing them with VW Mitigation funds will reduce vehicle emissions in a short period of time because many of these types of vehicles use more than 5 to 6 thousand gallons of gasoline/diesel per vehicle per year. Such vehicles operate in around buildings in congested areas, including near schools and medical facilities.

Vehicles that have high annual mileage and idling hours, such as vehicle service trucks, municipal public works trucks, package delivery trucks, and transit and paratransit vehicles, have a much better ratio of dollars invested to emissions reduced because of the very high fuel usage in these sectors, often 2 to 5 times more than a school bus. Most, if not all, of these vehicles in Class 4 – 7 can be efficiently re-powered, up-graded or originally ordered to operate on clean burning propane.

Propane vs. Other Eligible Technologies: A number of commenters sought mitigation plan revisions to put propane in a more favorable light when compared to other eligible projects. A common recommendation in support of propane and other alternative fuel projects is to place greater emphasis on reducing NO_X emissions. According to one commenter, the present draft plan "puts a thumb on the scale" in favor of all electric technologies over more cost-effective, more readily available and lower NO_X emitting propane and natural gas vehicle technologies.

Correct Funding Discrepancies for Alternative-Fueled Vehicles: One commenter pointed out that, while the consent decree allows for uneven reimbursements for EVs as compared to alternative fueled vehicles, Connecticut is not required to reimburse at these uneven amounts. For private fleets, the commenter recommended that reimbursement for new alternate fuel vehicles (electric, NGV, LPGV, H_2) should be equal at 25% for new replacements and 40% for repowers.

Adjust Funding Criteria: The total energy/emissions profile (often referred to as "well-to-wheels"), which includes emissions from electricity production, should be considered in lieu of calling plug-in hybrid electric vehicles "zero emissions" vehicles. Commenters point out that when this more comprehensive emissions analysis is used, natural gas trucks, buses and shuttles (propane shuttles too) are the most cost-effective approach to removing NO_X for the least amount of money per ton of pollutant reduced.

vii. Operational Comments

Two commenters offered suggestions regarding the administration and operation of the grant program. One was advocating for a professional public awareness campaign and the second was recommending financing and cost share options.

viii. General Comments

A number of commenters included mitigation plan suggestions affecting the program as a whole, independent of specific technologies. Others promoted emission reducing actions that fell outside the range of technology groupings. These are assembled below.

Submission Deadlines & Timing: Commenters advised that DEEP should be cognizant of municipal procurement and budgeting schedules as it sets deadlines for submission of applications.

Enhance Public Awareness: DEEP should implement a multi-stakeholder involved educational initiative to enhance awareness of these efforts.

Additional Criteria Recommended for Project Selection:

Local Economy: Consideration should be given to the local economy. Local contractors should receive more credit in grant selection.

Leveraging Funds: Consideration should be given to leveraging the available 15% of funds to projects that can access other sources of funding (cost sharing) to expand the overall effect of the money.

Environmental Justice Communities: Consideration should be given to choosing projects in environmental justice communities. Heavy-duty replacements and repowers, for example, have the potential for a large effect in environmental justice communities.

Broad Based Cost-Effectiveness: Connecticut should not use a NO_X-per-dollar cost effectiveness method of weighing projects. Cost effectiveness has already been factored in to selection of eligible projects. Cost benefit analysis should be done holistically, taking into account ancillary benefits such as fuel costs, operation costs and lower maintenance costs.

Previous Implementation Experience: The proposed plan should be amended so as not to give funding priority to entities with previous diesel project implementation experience. Favoring prior participants threatens to ignore potentially transformative projects and limit projects to traditional ideas and demographics.

Targeting Specific Fleets: It was recommended that mass transit, para transit and refuse fleets be the main focus of funding for government vehicles because they are very high mileage, highly visible, and impact and serve communities directly. Evaluating the main mobile sources of NO_X emissions in urban and non-attainment areas also means focusing on similar source categories.

Readiness of Electric Technology: This comment suggests that electric technology may not be sufficiently well established for all applications indicated in the plan, implying that technological readiness should be considered. The plan, as currently written, appears to focusing more on assisting "less-than-fully-commercialized electric vehicle technology" than in reducing NO_X, which is what the fund distribution to the states is intended to achieve.

Previously Neglected Options: Prioritize Class 8 freight trucks, especially privately owned, because, except for Clean Cities' grants, they have not been offered funding assistance in years; CMAQ and FHWA funding has been withheld from private companies by Connecticut since the 1990s.

Leverage Funds by Aligning with Other State Initiatives: Two commenters suggested that VW funds could be leveraged by combining them with existing state initiatives to yield economic, emissions, and energy benefits. Initiatives include EVConnecticut, the International ZEV Alliance and 8-State MOU and Action Plan, and the state's Comprehensive Energy Strategy.

Equitable Funding to Maximize Benefits: Regarding general funding under the mitigation plan, it was suggested that funding should not be segmented between government and non-government projects. There was concern that if public fleets could be funded up to 100% of the project cost, that would limit the number of vehicles replaced or repowered and therefore limit total emission reductions from the program. Some suggestions to address the discrepancy between public and private fleets were:

- To have funding levels just large enough to cover the incremental cost of the new vehicles and scrappage of the vehicles;
- To cap public fleet incentives at 20% of all mitigation funds;
- To limit public fleet funding to 50% of project cost; or
- Set a lower reimbursement for government fleets than the allowed 100%. Any fleet manager (private or public/gov't) should have "skin in the game" with a percentage of the investment coming from their own budgets. Commenter suggested a reimbursement system that pays government entities 60-75% of the replacement cost with monetary caps set for different vehicles GVWs. This would allow the state to stretch the impact of its dollars and achieve greater overall NO_X reductions.

Complementary Activities: One commenter recommended funding a short list of activities that would complement other eligible projects:

- Offsetting the added initial cost of hybrid-diesel or hybrid-CNG vehicles or all-electric buses;

- Offsetting conversion of some bus routes to short-range all-electric buses with rapid recharging at selected bus stations by overhead pantograph or wireless in-pavement equipment; and
- Electrification of the New Haven - Hartford - Springfield rail line to eliminate diesel engines on that line.

ix. Outside the Scope of the VW Settlement

DEEP received eleven comments advocating for the funding of environmentally desirable options that could reduce emissions, but fall outside the scope of eligible projects identified in Appendix D-2 of the VW settlement. These were from concerned citizens and state agencies.

Trails, Parks & Public Health: Four commenters recommended reducing diesel emissions by establishing more hiking and biking trails in the state. One of these included spending funds on chargers for electric bicycles. Two similar comments were received promoting expenditures for state parks. The improvement of public health was another recommendation for use of the VW settlement funds.

Miscellaneous Clean Technologies: One commenter advocated for remediating the NO_X problem through sequestration and another through transitioning to clean, renewable energy sources in the state. The funding of anaerobic digesters to reduce greenhouse gas emissions and provide clean energy was also recommended. Finally, one commenter suggested that funds be used to reduce emissions from classic cars by installing fuel injection systems.

APPENDIX D: Environmental Mitigation Actions and Mitigation Action Expenditures

APPENDIX D-2

ELIGIBLE MITIGATION ACTIONS AND MITIGATION ACTION EXPENDITURES

1. Class 8 Local Freight Trucks and Port Drayage Trucks (Eligible Large Trucks)

    a. Eligible Large Trucks include 1992-2009 engine model year Class 8 Local Freight or Drayage. For Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year trucks at the time of the proposed Eligible Mitigation Action, Eligible Large Trucks shall also include 2010-2012 engine model year Class 8 Local Freight or Drayage.

    b. Eligible Large Trucks must be Scrapped.

    c. Eligible Large Trucks may be Repowered with any new diesel or Alternate Fueled engine or All-Electric engine, or may be replaced with any new diesel or Alternate Fueled or All-Electric vehicle, with the engine model year in which the Eligible Large Trucks Mitigation Action occurs or one engine model year prior.

    d. For Non-Government Owned Eligible Class 8 Local Freight Trucks, Beneficiaries may only draw funds from the Trust in the amount of:

        1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.

        2. Up to 25% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.

        3. Up to 75% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.

        4. Up to 75% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

    e. For Non-Government Owned Eligible Drayage Trucks, Beneficiaries may only draw funds from the Trust in the amount of:

        1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.

        2. Up to 50% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.

3. Up to 75% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.

4. Up to 75% of the cost of a new all-electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

f. For Government Owned Eligible Class 8 Large Trucks, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.

2. Up to 100% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.

3. Up to 100% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.

4. Up to 100% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

2. Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Eligible Buses)

a. Eligible Buses include 2009 engine model year or older class 4-8 school buses, shuttle buses, or transit buses. For Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year buses at the time of the proposed Eligible Mitigation Action, Eligible Buses shall also include 2010-2012 engine model year class 4-8 school buses, shuttle buses, or transit buses.

b. Eligible Buses must be Scrapped.

c. Eligible Buses may be Repowered with any new diesel or Alternate Fueled or All-Electric engine, or may be replaced with any new diesel or Alternate Fueled or All-Electric vehicle, with the engine model year in which the Eligible Bus Mitigation Action occurs or one engine model year prior.

d. For Non-Government Owned Buses, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.

2. Up to 25% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.

3. Up to 75% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.

4. Up to 75% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

e. For Government Owned Eligible Buses, and Privately Owned School Buses Under Contract with a Public School District, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.

2. Up to 100% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.

3. Up to 100% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.

4. Up to 100% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

3. Freight Switchers

a. Eligible Freight Switchers include pre-Tier 4 switcher locomotives that operate 1000 or more hours per year.

b. Eligible Freight Switchers must be Scrapped.

c. Eligible Freight Switchers may be Repowered with any new diesel or Alternate Fueled or All-Electric engine(s) (including Generator Sets), or may be replaced with any new diesel or Alternate Fueled or All-Electric (including Generator Sets) Freight Switcher, that is certified to meet the applicable EPA emissions standards (or other more stringent equivalent State standard) as published in the CFR for the engine model year in which the Eligible Freight Switcher Mitigation Action occurs.

d. For Non-Government Owned Freight Switchers, Beneficiaries may draw funds from the Trust in the amount of :

1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine(s) or Generator Sets, including the costs of installation of such engine(s).

2. Up to 25% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) Freight Switcher.

3. Up to 75% of the cost of a Repower with a new All-Electric engine(s), including the costs of installation of such engine(s), and charging infrastructure associated with the new All-Electric engine(s).

4. Up to 75% of the cost of a new All-Electric Freight Switcher, including charging infrastructure associated with the new All-Electric Freight Switcher.

e. For Government Owned Eligible Freight Switchers, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine(s) or Generator Sets, including the costs of installation of such engine(s).

2. Up to 100% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) Freight Switcher.

3. Up to 100% of the cost of a Repower with a new All-Electric engine(s), including the costs of installation of such engine(s), and charging infrastructure associated with the new All-Electric engine(s).

4. Up to 100% of the cost of a new All-Electric Freight Switcher, including charging infrastructure associated with the new All-Electric Freight Switcher.

4. <u>Ferries/Tugs</u>

a. Eligible Ferries and/or Tugs include unregulated, Tier 1, or Tier 2 marine engines.

b. Eligible Ferry and/or Tug engines that are replaced must be Scrapped.

c. Eligible Ferries and/or Tugs may be Repowered with any new Tier 3 or Tier 4 diesel or Alternate Fueled engines, or with All-Electric engines, or may be upgraded with an EPA Certified Remanufacture System or an EPA Verified Engine Upgrade.

d. For Non-Government Owned Eligible Ferries and/or Tugs, Beneficiaries may only draw funds from the Trust in the amount of:

1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine(s), including the costs of installation of such engine(s).

2. Up to 75% of the cost of a Repower with a new All-Electric engine(s), including the costs of installation of such engine(s), and charging infrastructure associated with the new All-Electric engine(s).

e. For Government Owned Eligible Ferries and/or Tugs, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine(s), including the costs of installation of such engine(s).

2. Up to 100% of the cost of a Repower with a new All-Electric engine(s), including the costs of installation of such engine(s), and charging infrastructure associated with the new All-Electric engine(s).

5. Ocean Going Vessels (OGV) Shorepower

a. Eligible Marine Shorepower includes systems that enable a compatible vessel's main and auxiliary engines to remain off while the vessel is at berth. Components of such systems eligible for reimbursement are limited to cables, cable management systems, shore power coupler systems, distribution control systems, and power distribution. Marine shore power systems must comply with international shore power design standards (ISO/IEC/IEEE 80005-1-2012 High Voltage Shore Connection Systems or the IEC/PAS 80005-3:2014 Low Voltage Shore Connection Systems) and should be supplied with power sourced from the local utility grid. Eligible Marine Shorepower includes equipment for vessels that operate within the Great Lakes.

b. For Non-Government Owned Marine Shorepower, Beneficiaries may only draw funds from the Trust in the amount of up to 25% for the costs associated with the shore-side system, including cables, cable management systems, shore power coupler systems, distribution control systems, installation, and power distribution components.

c. For Government Owned Marine Shorepower, Beneficiaries may draw funds from the Trust in the amount of up to 100% for the costs associated with the shore-side system, including cables, cable management systems, shore power coupler systems, distribution control systems, installation, and power distribution components.

6. Class 4-7 Local Freight Trucks (Medium Trucks)

a. Eligible Medium Trucks include 1992-2009 engine model year class 4-7 Local Freight trucks, and for Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year trucks at the time of the proposed Eligible Mitigation Action, Eligible Trucks shall also include 2010-2012 engine model year class 4-7 Local Freight trucks.

b. Eligible Medium Trucks must be Scrapped.

c. Eligible Medium Trucks may be Repowered with any new diesel or Alternate Fueled or All-Electric engine, or may be replaced with any new diesel or Alternate Fueled or All-Electric vehicle, with the engine model year in which the Eligible Medium Trucks Mitigation Action occurs or one engine model year prior.

d. For Non-Government Owned Eligible Medium Trucks, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.

2. Up to 25% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.

3. Up to 75% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.

4. Up to 75% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

e. For Government Owned Eligible Medium Trucks, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.

2. Up to 100% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.

3. Up to 100% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.

4. Up to 100% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

7. Airport Ground Support Equipment

a. Eligible Airport Ground Support Equipment includes:

1. Tier 0, Tier 1, or Tier 2 diesel powered airport ground support equipment; and

2. Uncertified, or certified to 3 g/bhp-hr or higher emissions, spark ignition engine powered airport ground support equipment.

b. Eligible Airport Ground Support Equipment must be Scrapped.

c. Eligible Airport Ground Support Equipment may be Repowered with an All-Electric engine, or may be replaced with the same Airport Ground Support Equipment in an All-Electric form.

d. For Non-Government Owned Eligible Airport Ground Support Equipment, Beneficiaries may only draw funds from the Trust in the amount of:

1. Up to 75% of the cost of a Repower with a new All-Electric engine, including costs of installation of such engine, and charging infrastructure associated with such new All-Electric engine.

2. Up to 75% of the cost of a new All-Electric Airport Ground Support Equipment, including charging infrastructure associated with such new All-Electric Airport Ground Support Equipment.

e. For Government Owned Eligible Airport Ground Support Equipment, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 100% of the cost of a Repower with a new All-Electric engine, including costs of installation of such engine, and charging infrastructure associated with such new All-Electric engine.

2. Up to 100% of the cost of a new All-Electric Airport Ground Support Equipment, including charging infrastructure associated with such new All-Electric Airport Ground Support Equipment.

8. Forklifts and Port Cargo Handling Equipment

a. Eligible Forklifts includes forklifts with greater than 8000 pounds lift capacity.

b. Eligible Forklifts and Port Cargo Handling Equipment must be Scrapped.

c. Eligible Forklifts and Port Cargo Handling Equipment may be Repowered with an All-Electric engine, or may be replaced with the same equipment in an All-Electric form.

d. For Non-Government Owned Eligible Forklifts and Port Cargo Handling Equipment, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 75% of the cost of a Repower with a new All-Electric engine, including costs of installation of such engine, and charging infrastructure associated with such new All-Electric engine.

2. Up to 75% of the cost of a new All-Electric Forklift or Port Cargo Handling Equipment, including charging infrastructure associated with such new All-Electric Forklift or Port Cargo Handling Equipment.

e. For Government Owned Eligible Forklifts and Port Cargo Handling Equipment, Beneficiaries may draw funds from the Trust in the amount of:

1. Up to 100% of the cost of a Repower with a new All-Electric engine, including costs of installation of such engine, and charging infrastructure associated with such new All-Electric engine.

2. Up to 100% of the cost of a new All-Electric Forklift or Port Cargo Handling Equipment, including charging infrastructure associated with such new All-Electric Forklift or Port Cargo Handling Equipment.

9. Light Duty Zero Emission Vehicle Supply Equipment. Each Beneficiary may use up to fifteen percent (15%) of its allocation of Trust Funds on the costs necessary for, and directly connected to, the acquisition, installation, operation and maintenance of new light duty zero emission vehicle supply equipment for projects as specified below. Provided, however, that Trust Funds shall not be made available or used to purchase or rent real-estate, other capital costs (e.g., construction of buildings, parking facilities, etc.) or general maintenance (i.e., maintenance other than of the Supply Equipment).

   a. Light duty electric vehicle supply equipment includes Level 1, Level 2 or fast charging equipment (or analogous successor technologies) that is located in a public place, workplace, or multi-unit dwelling and is not consumer light duty electric vehicle supply equipment (i.e., not located at a private residential dwelling that is not a multi-unit dwelling).

   b. Light duty hydrogen fuel cell vehicle supply equipment includes hydrogen dispensing equipment capable of dispensing hydrogen at a pressure of 70 megapascals (MPa) (or analogous successor technologies) that is located in a public place.

   c. Subject to the 15% limitation above, each Beneficiary may draw funds from the Trust in the amount of:

      1. Up to 100% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that will be available to the public at a Government Owned Property.

      2. Up to 80% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that will be available to the public at a Non-Government Owned Property.

      3. Up to 60% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that is available at a workplace but not to the general public.

      4. Up to 60% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that is available at a multi-unit dwelling but not to the general public.

5. Up to 33% of the cost to purchase, install and maintain eligible light duty hydrogen fuel cell vehicle supply equipment capable of dispensing at least 250 kg/day that will be available to the public.

6. Up to 25% of the cost to purchase, install and maintain eligible light duty hydrogen fuel cell vehicle supply equipment capable of dispensing at least 100 kg/day that will be available to the public.

10. Diesel Emission Reduction Act (DERA) Option. Beneficiaries may use Trust Funds for their non-federal voluntary match, pursuant to Title VII, Subtitle G, Section 793 of the DERA Program in the Energy Policy Act of 2005 (codified at 42 U.S.C. § 16133), or Section 792 (codified at 42 U.S.C. § 16132) in the case of Tribes, thereby allowing Beneficiaries to use such Trust Funds for actions not specifically enumerated in this Appendix D-2, but otherwise eligible under DERA pursuant to all DERA guidance documents available through the EPA. Trust Funds shall not be used to meet the non-federal mandatory cost share requirements, as defined in applicable DERA program guidance, of any DERA grant.

Eligible Mitigation Action Administrative Expenditures

For any Eligible Mitigation Action, Beneficiaries may use Trust Funds for actual administrative expenditures (described below) associated with implementing such Eligible Mitigation Action, but not to exceed 15% of the total cost of such Eligible Mitigation Action. The 15% cap includes the aggregated amount of eligible administrative expenditures incurred by the Beneficiary and any third-party contractor(s).

1. Personnel including costs of employee salaries and wages, but not consultants.
2. Fringe Benefits including costs of employee fringe benefits such as health insurance, FICA, retirement, life insurance, and payroll taxes.
3. Travel including costs of Mitigation Action-related travel by program staff, but does not include consultant travel.
4. Supplies including tangible property purchased in support of the Mitigation Action that will be expensed on the Statement of Activities, such as educational publications, office supplies, etc. Identify general categories of supplies and their Mitigation Action costs.
5. Contractual including all contracted services and goods except for those charged under other categories such as supplies, construction, etc. Contracts for evaluation and consulting services and contracts with sub-recipient organizations are included.
6. Construction including costs associated with ordinary or normal rearrangement and alteration of facilities.
7. Other costs including insurance, professional services, occupancy and equipment leases, printing and publication, training, indirect costs, and accounting.

Definitions/Glossary of Terms

“Airport Ground Support Equipment” shall mean vehicles and equipment used at an airport to service aircraft between flights.

“All-Electric” shall mean powered exclusively by electricity provided by a battery, fuel cell, or the grid.

“Alternate Fueled” shall mean an engine, or a vehicle or piece of equipment that is powered by an engine, which uses a fuel different from or in addition to gasoline fuel or diesel fuel (e.g., CNG, propane, diesel-electric Hybrid).

“Certified Remanufacture System or Verified Engine Upgrade” shall mean engine upgrades certified or verified by EPA or CARB to achieve a reduction in emissions.

“Class 4-7 Local Freight Trucks (Medium Trucks)” shall mean trucks, including commercial trucks, used to deliver cargo and freight (e.g., courier services, delivery trucks, box trucks moving freight, waste haulers, dump trucks, concrete mixers) with a Gross Vehicle Weight Rating (GVWR) between 14,001 and 33,000 lbs.

"Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Buses)" shall mean vehicles with a Gross Vehicle Weight Rating (GVWR) greater than 14,001 lbs. used for transporting people. See definition for School Bus below.

"Class 8 Local Freight, and Port Drayage Trucks (Eligible Large Trucks)" shall mean trucks with a Gross Vehicle Weight Rating (GVWR) greater than 33,000 lbs. used for port drayage and/or freight/cargo delivery (including waste haulers, dump trucks, concrete mixers).

"CNG" shall mean Compressed Natural Gas.

"Drayage Trucks" shall mean trucks hauling cargo to and from ports and intermodal rail yards.

"Forklift" shall mean nonroad equipment used to lift and move materials short distances; generally includes tines to lift objects. Eligible types of forklifts include reach stackers, side loaders, and top loaders.

"Freight Switcher" shall mean a locomotive that moves rail cars around a rail yard as compared to a line-haul engine that moves freight long distances.

"Generator Set" shall mean a switcher locomotive equipped with multiple engines that can turn off one or more engines to reduce emissions and save fuel depending on the load it is moving.

"Government" shall mean a State or local government agency (including a school district, municipality, city, county, special district, transit district, joint powers authority, or port authority, owning fleets purchased with government funds), and a tribal government or native village. The term "State" means the several States, the District of Columbia, and the Commonwealth of Puerto Rico.

"Gross Vehicle Weight Rating (GVWR)" shall mean the maximum weight of the vehicle, as specified by the manufacturer. GVWR includes total vehicle weight plus fluids, passengers, and cargo.

Class 1: < 6000 lb.
Class 2: 6001-10,000 lb.
Class 3: 10,001-14,000 lb.
Class 4: 14,001-16,000 lb.
Class 5: 16,001-19,500 lb.
Class 6: 19,501-26,000 lb.
Class 7: 26,001-33,000 lb.
Class 8: > 33,001 lb.

"Hybrid" shall mean a vehicle that combines an internal combustion engine with a battery and electric motor.

"Infrastructure" shall mean the equipment used to enable the use of electric powered vehicles (e.g., electric vehicle charging station).

"Intermodal Rail Yard" shall mean a rail facility in which cargo is transferred from drayage truck to train or vice-versa.

"Port Cargo Handling Equipment" shall mean rubber-tired gantry cranes, straddle carriers, shuttle carriers, and terminal tractors, including yard hostlers and yard tractors that operate within ports.

"Plug-in Hybrid Electric Vehicle (PHEV)" shall mean a vehicle that is similar to a Hybrid but is equipped with a larger, more advanced battery that allows the vehicle to be plugged in and recharged in addition to refueling with gasoline. This larger battery allows the car to be driven on a combination of electric and gasoline fuels.

"Repower" shall mean to replace an existing engine with a newer, cleaner engine or power source that is certified by EPA and, if applicable, CARB, to meet a more stringent set of engine emission standards. Repower includes, but is not limited to, diesel engine replacement with an engine certified for use with diesel or a clean alternate fuel, diesel engine replacement with an electric power source (e.g., grid, battery), diesel engine replacement with a fuel cell, diesel engine replacement with an electric generator(s) (genset), diesel engine upgrades in Ferries/Tugs with an EPA Certified Remanufacture System, and/or diesel engine upgrades in Ferries/Tugs with an EPA Verified Engine Upgrade. All-Electric and fuel cell Repowers do not require EPA or CARB certification.

"School Bus" shall mean a Class 4-8 bus sold or introduced into interstate commerce for purposes that include carrying students to and from school or related events. May be Type A-D.

"Scrapped" shall mean to render inoperable and available for recycle, and, at a minimum, to specifically cut a 3-inch hole in the engine block for all engines. If any Eligible Vehicle will be replaced as part of an Eligible project, Scrapped shall also include the disabling of the chassis by cutting the vehicle's frame rails completely in half.

"Tier 0, 1, 2, 3, 4" shall refer to corresponding EPA engine emission classifications for nonroad, locomotive, and marine engines.

"Tugs" shall mean dedicated vessels that push or pull other vessels in ports, harbors, and inland waterways (e.g., tugboats and towboats).

"Zero Emission Vehicle (ZEV)" shall mean a vehicle that produces no emissions from the on-board source of power (e.g., All-Electric or hydrogen fuel cell vehicles).