
STATE OF HAWAII

# PROPOSED BENEFICIARY MITIGATION PLAN

PER

VOLKSWAGEN SETTLEMENT ENVIRONMENTAL MITIGATION TRUST AGREEMENT

*Prepared and submitted by the Hawaii State Energy Office within the State of Hawaii Department of Business, Economic Development, and Tourism*

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# TABLE OF CONTENTS

# EXECUTIVE SUMMARY

The State of Hawaii, through its Department of Business, Economic Development, and Tourism's (DBEDT) Hawaii State Energy Office (HSEO) collectively "DBEDT-HSEO", respectfully submits and makes publicly available the following non-binding Beneficiary Mitigation Plan (Plan) for consideration by Wilmington Trust, as a requirement of the Consent Decree and State Trust Agreement. In accordance with the Trust agreement, the Plan proposes how DBEDT-HSEO, on behalf of the State of Hawaii, intends to expend the $8.125 million allocation of the Volkswagen (VW) Environmental Mitigation Trust (Trust).

The Trust is an element of the settlement with VW's created in response to VWs use of an illegal defeat device (software designed to cheat emissions tests) in certain 2.0- and 3.0-liter VW diesel vehicles. DBEDT-HSEO is the designated Lead Agency acting on the State's behalf as beneficiary to implement Hawaii's allocation of the $3 billion Trust. As provided in two court-approved Partial Consent Decrees (Consent Decrees), the Mitigation Trust is intended to fully mitigate the lifetime excess nitrogen oxides (NOx) emissions caused by VW's actions.

In addition to fully mitigating the excess lifetime NOx emissions of the VW vehicles subject to the Settlement, the State of Hawaii's overall goal for the funds is to support projects which will aid the State in achieving many of its clean energy goals including supporting the ultimate elimination of Hawaii's dependence on imported fuels in ground transportation.

To support this goal, HSEO will prioritize Eligible Mitigation Actions that will make a transformational investment in Hawaii's clean energy economy with a specific emphasis on projects that facilitate the adoption and deployment of grid-connected, battery-electric zero emission vehicles (EV). HSEO's estimated allocation amounts are based on the availability of zero-emission technology, the impact on the transition toward the ultimate elimination of imported fuel in ground transportation, and the present feasibility and market interest in Hawaii.

HSEO developed the following allocation of trust funds to three Eligible Mitigation Action categories that will be appropriate to achieve the goals of the trust:

- $4.15 million, or 51 percent of Trust Funds, to projects which electrify Class 4-8 School Buses, Shuttle Buses, or Transit Buses (Environmental Mitigation Action #2)
- $2.75 million, or 34 percent of Trust Funds, to projects eligible under the federal Diesel Emission Reduction Act grant program (Environmental Mitigation Action #10)
- $1.22 million, or 15 percent of Trust Funds, to support projects which facilitate the deployment of Light Duty Zero Emission Vehicle Supply Equipment (Environmental Mitigation Action #9)

Environmental Mitigation Actions #2 and #10 may be used to procure buses. As a technology, battery electric buses are commercially available and are actively sought out by state and county agencies.

Environmental Mitigation Action #9 will help further the adoption of EVs. Hawaii is a national leader in the adoption of light-duty electric passenger vehicles. Hawaii currently ranks 2nd in adoption of EV's, trailing only California. The State's and Counties' activities toward decarbonizing their fleets will bolster this momentum.

Over a 10-year period, each of the project categories are expected to benefit areas in Hawaii that bear a disproportionate share of the air pollution burden and fully mitigate the excess NOx emissions through the replacement of older, high-emitting vehicles and equipment with low and zero emission advanced technology vehicles and equipment. The proposed project categories are in line with input from stakeholders, State and County agencies, and members of the public. In addition, DBEDT-HSEO's proposal allows the state to make transformative investments in clean transportation by supporting the deployment of zero-emission medium and heavy-duty fleet vehicles and the advancement of light-duty zero-emission vehicle charging infrastructure, both of which are necessary to meet the State's ambitious clean energy goals.

# 1 PURPOSE

In order to receive and expend Volkswagen (VW) Settlement Environmental Mitigation Trust[1] (Trust) funding, the State of Hawaii must submit and make publicly available a Beneficiary Mitigation Plan (Plan) that summarizes how Hawaii intends to use its allotted mitigation funds[2]. As the Lead Agency delegated for Trust purposes, the Department of Business, Economic Development, and Tourism's (DBEDT) Hawaii State Energy Office (HSEO) submits this Plan on behalf of the State of Hawaii.

This Plan describes Hawaii's overall goals for Hawaii's initial allocation of $8,125,000[3] on Environmental Mitigation Actions. Beneficiary mitigation plans are due at least 30 days prior to the first funding request.

# 2 ABOUT THE VOLKSWAGEN SETTLEMENT

The "Volkswagen (VW) Settlement" is a series of legal settlements between various United States agencies, the State of California, and six VW-related entities – including VW, Audi, and Porsche – to resolve multiple criminal and civil enforcement cases against VW stemming from violations to the federal Clean Air Act (CAA) and efforts to conceal these violations.

In June 2016 the United States District Court for the Northern District of California (Court) issued a partial consent decree[4] settling claims by the U.S. Environmental Protection Agency (EPA) and the Federal Trade Commission (FTC) against German automaker Volkswagen. The civil complaint filed against VW claimed that the automaker installed software in its 2.0- and 3.0-liter diesel engine vehicles to disable emission controls under normal use and to turn on

[1] Volkswagen Diesel Emissions Environmental Mitigation Trust. https://www.vwenvironmentalmitigationtrust.com/

[2] Pursuant to Appendix D, paragraph 4.1, of the October 2017 State Trust Agreement.

[3] Beneficiaries have 10 years to spend allocated trust funds. After that, unused trust funds will be redistributed as supplemental funding among beneficiaries that have used at least 80% of their allocated trust funds. Such beneficiaries will be given five additional years to use the supplemental funding. Along with a handful of smaller states, Hawaii received the minimum allocation from the VW settlement.

[4] The State Trust and Indian Tribe Trust have been established by order of the United States District Court for the Northern District of California in accordance with a Partial Consent Decree on October 25, 2016 in re: Volkswagen "Clean Diesel" Marketing, Sales Practices, and Products Liability Litigation, MDL No. 2672 CRB (JSC) (Dkt. No. 2103-1), among Volkswagen AG, Audi AG, Volkswagen Group of America, Inc., and Volkswagen Group of America Chattanooga Operations, LLC, the United States, and the State of California. In that case, the Court also entered a Second Partial Consent Decree (Dkt. No. 3228-1) on May 17, 2017 (the "Second Consent Decree"), among the Settling Defendants, Dr. Ing. h.c. F. Porsche AG, and Porsche Cars North America, Inc., the United States, and the State of California. Pursuant to the First Partial Consent Decree and the Second Partial Consent Decree. The First Partial Consent Decree and the Second Consent Decree are collectively, referred to as the Consent Decrees.

emission controls only when the vehicle was being tested. As a result, VW was charged with selling approximately 590,000 model years 2009 to 2016 2.0-liter and 3.0-liter diesel motor vehicles equipped with computer "defeat devices" which resulted in better real-world fuel mileage and driving performance, but also resulted in the release of thousands of tons of nitrogen oxides (NOx) emissions in excess of CAA regulated limits[5]. NOx emissions are a significant health concern that contribute to the formation of smog and is linked to numerous respiratory- and cardiovascular-related health effects[6].

# 3 ABOUT THE ENVIRONMENTAL MITIGATION TRUST

The Settlement requires VW to establish a $2.925 billion Environmental Mitigation Trust for State Beneficiaries (Trust)—i.e., for the 50 States, Puerto Rico, and the District of Columbia—to be independently administered by the appointed Trustee, Wilmington Trust, NA[7]. The purpose of the Trust is to fund projects (Eligible Mitigation Actions) that mitigate the environmental damage caused by emissions from the non-compliant VW vehicles where they were, are, or will be operated. The specified Eligible Mitigation Actions (Actions) are focused mostly on "scrap and replace" projects for the medium and heavy-duty vehicle sectors, but provides for some allocation towards light-duty zero emission vehicle supply equipment. The Trust also provides for the administration and operation by Trust Beneficiaries in accordance with the terms of the Trust.

The Trust is one component of the Settlement and is enumerated in the first Partial Consent Decrees as Appendix D. The State Mitigation Trust Agreement[8] (State Trust Agreement) was filed with the Court on October 2, 2017, which is the Effective Date of the Trust.

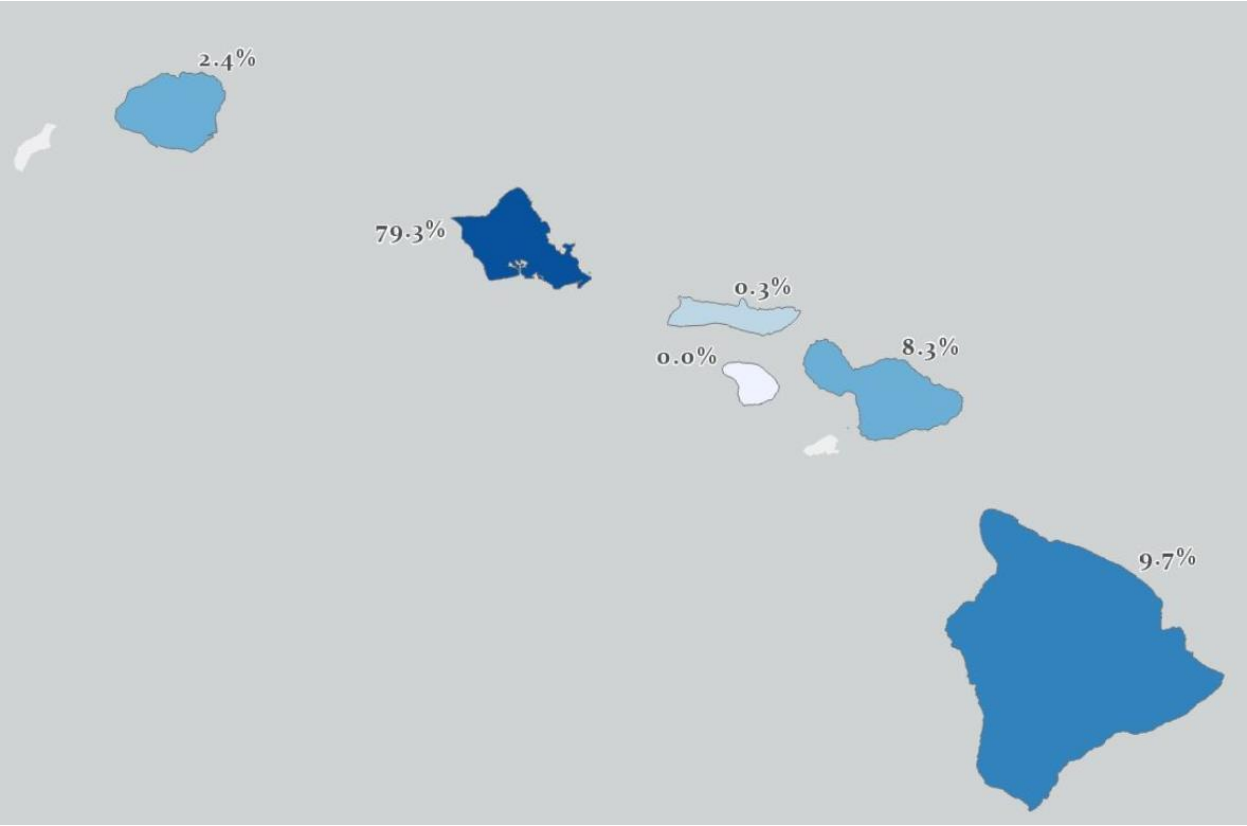
## 3.1 Hawaii's Beneficiary Status

On January 29, 2018, the Trustee filed a Notice of Beneficiary Designation with the Court officially designating Hawaii as a Beneficiary of the State Trust. As a designated Beneficiary of the Trust, Hawaii's initial allocation is $8,125,000 for the 2.0L and 3.0L vehicles, as determined

[5] The VW emissions control problem was identified and flagged by researchers at West Virginia University who were funded by the International Council on Clean Transportation. The researchers conducted on-road testing of VW models equipped with 2.0 liter turbocharged 4-cylinder diesel engine in May 2014. The testing revealed that average emissions in on-road testing exceeded federal NOx limits between 9 and 38 times the U.S. limit depending on driving conditions which is roughly equivalent to real-world emissions from a modern tractor-trailer truck.
[6] US EPA. Nitrogen Dioxide (NO2) Pollution. https://www.epa.gov/no2-pollution
[7] A separate Indian Tribe Mitigation Trust was also established for federally-recognized Indian Tribe Beneficiaries eligible to receive part of the overall $2.925B Trust allocation.
[8] Environmental Mitigation Trust Agreement for State Beneficiaries.
https://www.vwenvironmentalmitigationtrust.com/sites/default/files/2018-05/Final%20Filed%20Dkt%2051-1%20%20State%20Beneficiary%20Trust%20Agreement_0.pdf

by the number of affected model year 2009-2016 VW vehicles registered in Hawaii[9].

**Figure 1: Map of Estimated Percentage of Hawaii's Subject Volkswagen Vehicle Populations by Island**




In November 2017 State of Hawaii Governor David Ige designated DBEDT to serve as the State's Lead Agency for purposes of overseeing and administering the State's Trust allocation. HSEO, a division of DBEDT, is the primary agency charged with the determining the expenditure of Hawaii's Trust fund allocation.

HSEO has steadily increased experience, cultivated expertise, and exercised leadership in supporting clean transportation implementation across Hawaii. This includes the adoption of electric vehicles[10] (EV) and associated charging infrastructure which directly contribute to reducing petroleum consumption and emissions in the transportation sector. In 2015, DBEDT

[9] Under the settlements, Volkswagen is required to implement a restitution and recall program for owners and lessees of 2.0-liter diesel vehicles, of the model year 2009 through 2015 at a maximum cost of just over $10 billion.
[10] Electric vehicle means: (1) A neighborhood electric vehicle; or (2) A vehicle, with four or more wheels, that draws propulsion energy from a battery with at least four kilowatt hours of energy storage capacity that can be recharged from an external source of electricity.

published the Hawaii Clean Energy Initiative Transportation Energy Analysis[11] report, recommending tactics aimed at a 72-million-gallon-a-year reduction in fossil fuel consumption by 2030. The recommended tactics in the report identify the potential and means by which petroleum consumption could be reduced in the transportation sector based on achievable and economically feasible actions. In 2009 DBEDT committed nearly $5 million of the American Recovery and Reinvestment Act funds to launch the Hawaii EV Ready Program, stimulating Hawaii's EV market demand. In 2015 DBEDT facilitated a working group, required by Act 164, Session Laws of Hawaii 2015, to address the installation of EV charging systems at multi-unit dwellings and published a final report in December 2015. DBEDT also has developed Hawaii's federally recognized Alternative Fuel Corridors within the City and County of Honolulu, County of Hawaii, and Maui County.

### 3.1.1 Eligible Mitigation Actions

The Trust specifies certain categories of Eligible Mitigation Actions that are eligible to be funded by the Trust. The parties to the State Trust Agreement have determined that each of these Eligible Mitigation Actions achieve sufficient NOx reductions to fulfill the purposes of the Trust. Beneficiaries may fund any of the eligible mitigation actions in any proportion, except that no more than 15 percent of the funds may be used for light-duty zero emission vehicle supply equipment. The Settlement funds the replacement of older, high-polluting heavy-duty vehicles, engines, and/or equipment. To ensure that such replacements achieve the intended emission reductions, the replaced equipment must be scrapped. Beneficiaries are encouraged to recycle scrapped vehicles, engines, and equipment to reduce unnecessary waste.

The State of Hawaii may spend Trust funds on projects that fall within the following ten Eligible Mitigation Actions:

1. Class 8 Local Freight Trucks and Port Drayage Trucks: Trucks with 1992-2012 model year engines and gross vehicle weight rating (GVWR) greater than 33,000 pounds used for freight or cargo delivery, including waste haulers, dump trucks, and concrete mixers.

2. Class 4-8 School Buses, Shuttle Buses, and Transit Buses: Buses with pre-2013 model year engines and GVWR greater than 14,001 pounds used for transporting people, including Class 4-8 school buses sold or introduced into interstate commerce for purposes that include carrying students to and from school or related events (may be Type A-D).

[11] Hawaii DBEDT-HSEO. Hawaii Clean Energy Initiative Transportation Energy Analysis. August 2015. http://www.hawaiicleanenergyinitiative.org/wp-content/uploads/2015/02/Final_TransEnergyAnalysis_8.19.15.pdf

3. Freight Switchers: Pre-Tier 4 engine switcher locomotives that move rail cars around a rail yard (as compared to line-haul engines that move freight long distances).

4. Ferries and Tugs: Tier 2 or earlier marine engines used in ferries and dedicated tugboats and towboats.

5. Ocean-Going Vessels (OGV) Shore Power: Systems that enable a compatible vessel's main and auxiliary engines to remain off while the vessel is at berth.

6. Class 4-7 Local Freight Trucks: Trucks with 1992-2012 model year engines and GVWR between 14,001 and 33,000 pounds used to deliver cargo and freight, such as courier services, delivery trucks, box trucks moving freight, waste haulers, dump trucks, and concrete mixers.

7. Airport Ground Support Equipment (GSE): Tier 2 and earlier diesel engine GSE, and spark ignition engine GSE with uncertified or certified 3.0 gram per brake-horsepower-hour (g/bhp-hr) or higher engines.

8. Forklifts and Port Cargo Handling Equipment: Lift equipment, such as forklifts, reach stackers, side loaders, and top loaders, with greater than 8,000 pounds lift capacity; and port cargo handling equipment, such as rubber-tired gantry cranes, straddle carriers, shuttle carriers, and yard trucks that operate within ports.

9. Light-Duty Zero-Emission Vehicle Supply Equipment: Acquisition, installation, operation, and maintenance of new light-duty zero-emission vehicle supply equipment (Level 1, Level 2, or fast charging) located in a public place, workplace, or multi-unit dwelling; or light-duty hydrogen fuel cell vehicle supply equipment dispensing at a pressure of 70 megapascals (MPa) located in a public place. The State may use no more than 15 percent of its total allocation for this category.

10. Diesel Emissions Reduction Act (DERA) Option: EPA allocates DERA funds to eligible U.S. States and territories for the establishment of clean diesel grant, rebate, and loan programs. This option allows state and tribes to use mitigation trust funds under specific EPA DERA projects including vehicle replacements, engine replacements, exhaust retrofits, idle reduction technology for buses, medium-duty or heavy-duty trucks, marine engines, locomotives, and non-road vehicles and equipment.

### 3.1.2 Beneficiary Mitigation Plan Requirements

In accordance with the Trust agreement, Hawaii is required to submit and make publicly available a "Beneficiary Mitigation Plan". This Plan is intended to provide insight into Hawaii's high-level vision for use of the mitigation funds and information about which Environmental Mitigation Actions Hawaii expects to make investments[12]. The Plan submitted to the Trustee must also address:

1. Hawaii's overall goal for the use of the funds.
2. Eligible mitigation actions which Hawaii anticipates funding to achieve the stated goals and the percentages of funds anticipated to be used for each type of eligible mitigation action.
3. How Hawaii will consider the potential beneficial impact of the selected eligible mitigation actions on air quality in areas that bear a disproportionate share of the air pollution burden within its jurisdiction.
4. Expected ranges of emission benefits Hawaii estimates would be realized by implementation of the eligible mitigation actions identified in the Plan.

In addition to the above listed Plan components, the process for seeking and considering public comments on Hawaii's Plan is included as required by the State Trust Agreement[13].

Hawaii can submit funding requests[14] for its allocation of $8.125 million 30 days after this Plan has been approved by the Trustee. Hawaii will have until October 3, 2027 to request its allocation of the Trust and implement mitigation actions.

### 3.1.3 Public Outreach

In February 2018 HSEO initiated the public process required for developing the Plan by posting the "VW Request for Public Input" questionnaire on HSEO's Volkswagen Settlement website[15]. The questionnaire was aimed to gather public input and perspectives regarding Hawaii's utilization of Trust funds, specifically on the Eligible Mitigation Actions outlined in the Settlement. One hundred and forty-eight (148) responses to HSEO's questionnaire from Oahu,

[12] Nothing in this provision is intended to make the Plan binding on any Beneficiary, nor does it create any rights in any person to claim an entitlement of any kind. The Trustee has no duty to monitor or supervise any Beneficiary's compliance with its Plan. The Trust allows Hawaii to revise its Plan. The Beneficiary Mitigation Plan need only provide the level of detail reasonably ascertainable at the time of submission.

[13] Beneficiaries have discretion in how they seek and consider public input on their Beneficiary Mitigation Plans; however, the plans must explain the process by which the Beneficiary shall seek and consider public input see paragraph 4.2.7 of the Trust)

[14] See section 5.2 of the Trust

[15] Hawaii DBEDT-HSEO. Volkswagen Settlement Overview webpage. http://energy.hawaii.gov/vw-settlement/vw

Maui, Hawaii Island, Kauai, and the mainland United States were submitted providing the public's perspectives and priorities on the Eligible Mitigation Actions and Hawaii's allocation of the Trust[16].

**Figure 2: Request for Public Input – Number of Responses**

| County | Count | % |
|---|---|---|
| Honolulu | 59 | 40% |
| Maui | 55 | 37% |
| Hawaii | 12 | 8% |
| Kauai | 5 | 3% |
| Other | 17 | 11% |
| Total | 148 | |

The questionnaire asked respondents to list the top three categories of Eligible Mitigation Actions that Hawaii should consider for the VW trust funding. Most questionnaire responses (89 percent) prioritized school buses, shuttle buses, or transit buses (Action #2), sixty-six percent (66 percent) prioritized local freight trucks and port drayage trucks (Action #1), and 57 percent prioritized light-duty zero emission vehicle supply equipment (Action #9). Survey respondents also felt that County Government Fleets (80 percent) should be targeted for Trust funding.

**Figure 3: Request for Public Input – Priority Environmental Mitigation Actions**

| Eligible Mitigation Actions | % |
|---|---|
| Class 4-8 School Buses, Shuttle Buses, or Transit Buses | 89% |
| Class 8 Local Freight Trucks and Port Drayage Trucks | 66% |
| Light Duty Zero Emission Vehicle Supply Equipment | 57% |

The questionnaire provides insight from a segment of the public who have a heightened interest in the expenditure of VW funds. The collective public input was taken into consideration in the development of this Plan. Along with the questionnaire, HSEO consulted with state and county agencies, industry experts, national stakeholders, and received over fifty (50) comments and inquiries sent in via e-mail from members of the public and stakeholders[17]. Further discussion on Hawaii's Trust Fund objectives and considerations can be found in

[16] The questionnaire closed on March 20, 2018.

[17] Additional public comments, information, and questions were sent directly to HSEO's dbedt.vwsettlement@hawaii.gov email address.

Sections 5 and 6.

# 4 HAWAII'S AIR QUALITY AND ENERGY STATUS

This section of the Plan provides an overview of Hawaii's current air quality and energy status. Hawaii's unique geographic location provides a generally good air quality index statewide. While the state is heavily dependent on imported petroleum to meet energy and fuel needs, the air is generally low in pollutants such as carbon monoxide, hydrogen sulfide, nitrogen dioxide, and fine particulate matter, 2.5 microns (size) or smaller. The information in this section includes current NOx emissions and sources within the State and provides insight on areas that bear a disproportionate share of the air pollution which HSEO will look to focus on when facilitating the distribution of Trust funds.

## 4.1 Air Quality in Hawaii

Per the Settlement, Beneficiaries are required to invest in actions that achieve sufficient reductions in NOx emissions by replacing older, high-polluting heavy-duty vehicles, engines, and/or equipment. To ensure the investments and vehicle replacements achieve emissions reductions for Hawaii, Figures 3 and 4 provide an overview of current NOx emissions and sources in the State.

The State of Hawaii Department of Health (DOH) monitors the ambient air quality in Hawaii. The DOH compares the air quality to the National Ambient Air Quality Standards (NAAQS), numerical thresholds below which no health impacts are expected. Areas designated as "non-attainment" by the EPA are areas where pollution levels have not met the NAAQS for criteria air pollutants. When an area has pollutant levels lower (i.e., better) than the standards, that area is said to be in "attainment" of the NAAQS. Due to its low levels of criteria pollutants, the State of Hawaii receives an "in-attainment" status from the U.S. Environmental Protection Agency (EPA). Unlike other "in-attainment" states, Hawaii is not subject to stricter air pollution rules[18] and is not required by federal law to measure NOx or test for smog from mobile sources, however the US EPA measures NOx emissions along with other criteria air pollutants for the National Emissions Inventory; which was used to calculate Hawaii's NOx emissions found in figures 3 and 4 below.

Figure 3 indicates that fuel combustion sources (e.g. utility power plants) produce 44 percent of Hawaii's NOx emissions, while mobile sources (i.e. transportation sector) contribute to 40 percent of the total NOx emissions for the state. Figure 4 breaks down the NOx emissions produced by mobile sources for the state. Forty-seven percent of mobile emissions are

[18] On the East coast, states are subject to the Cross-State Air Pollution Rule even though they are in-attainment. CSAPR; https://www.epa.gov/csapr

produced by on-road non-diesel light duty vehicles; aircraft produce 16 percent; non-road diesel equipment produces 13 percent; and on-road diesel heavy duty vehicles produce 11 percent of Hawaii's total NOx emissions.

**Figure 4: NOx Emissions in Hawaii[19]**

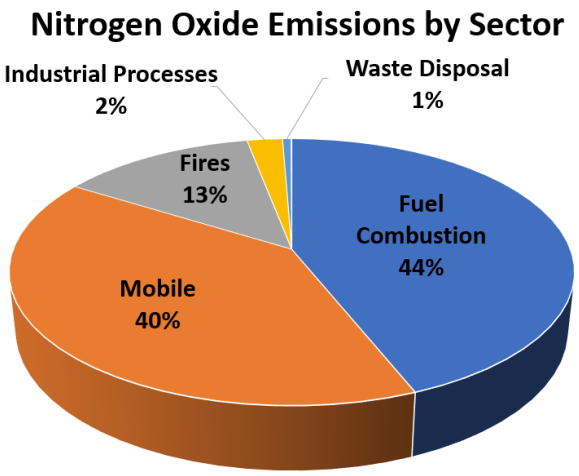
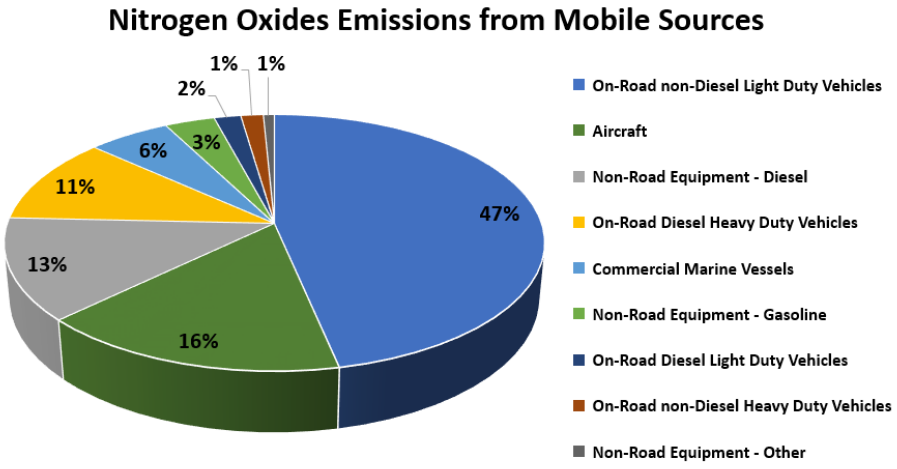



**Figure 5: NOx Emissions from Mobile Sources in Hawaii[20]**



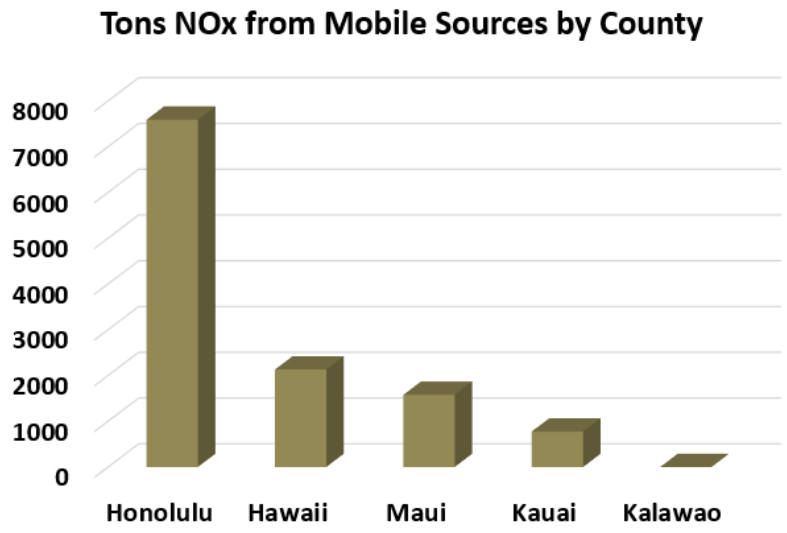

[19] 2014 National Emissions Inventory, US EPA (https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data)

[20] 2014 NEI – Data Queries, Sector Summaries Criteria and Hazardous Air pollutants by 60 EIS emission. https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data

### 4.1.1 Areas that Bear a Disproportionate Share of the Air Pollution Burden

Per the Trust, the Beneficiary Mitigation Plan must describe how each Beneficiary will consider the potential beneficial impact of the selected Eligible Mitigation Actions on air quality in areas that bear a disproportionate share of the air pollution burden within its jurisdiction[21]. The available data shows there are no regions within Hawaii that do not meet air quality standards; however, there are some lower-income census tracts[22] located within the areas showing higher levels of NOx from stationary or non-mobile sources. Figure 5 displays NOx emissions from mobile sources across each county, with the greatest NOx emissions (roughly 7,000 tons) found in the City and County of Honolulu.

**Figure 6: NOx Emissions from Mobile Sources by County**




[21] During Settlement negotiations, the U.S. Department of Justice (DOJ) received public comments emphasizing that mitigation projects funded by the Trust should target environmental justice communities of concern, historically disadvantaged communities and densely populated regions that are designated as not meeting air quality standards. In response to these comments, the DOJ added this requirement to the beneficiary mitigation plan. See Exhibit 5 to United States Motion for Entry of Partial Consent Decree, Document 1973-12, p. 29 of 33, filed Sept. 30, 2016.

[22] See Appendix 7.3: Percent of Persons Below Poverty Level by Census Tract.

**Figure 7: Map of Nitrogen Oxides Emissions from Stationary Sources by Zip Code[23]**

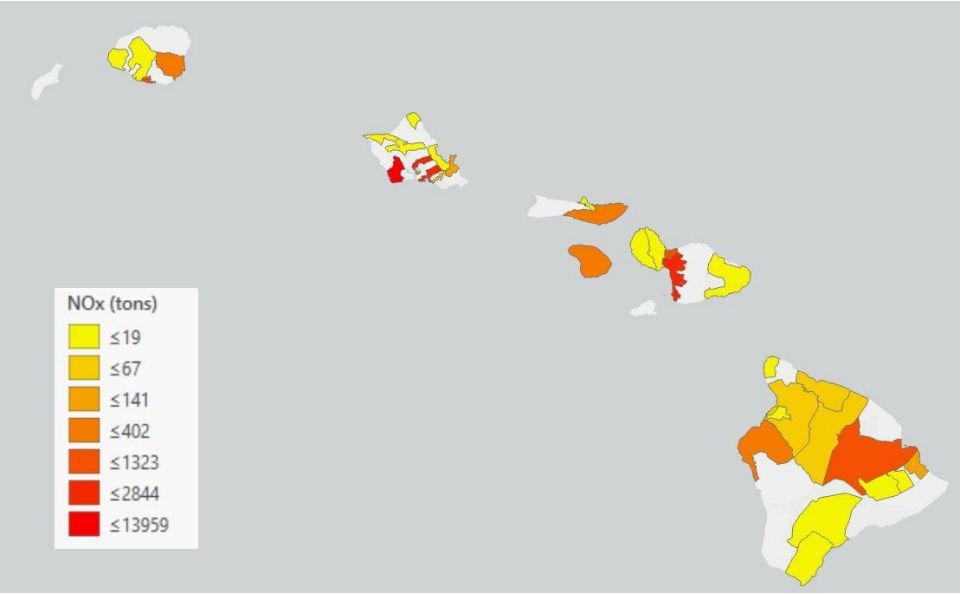



Figure 6 shows NOx emissions across the state from stationary or non-mobile sources. HSEO will take this analysis into consideration when evaluating the locations in which the selected Eligible Mitigation Actions will be deployed.

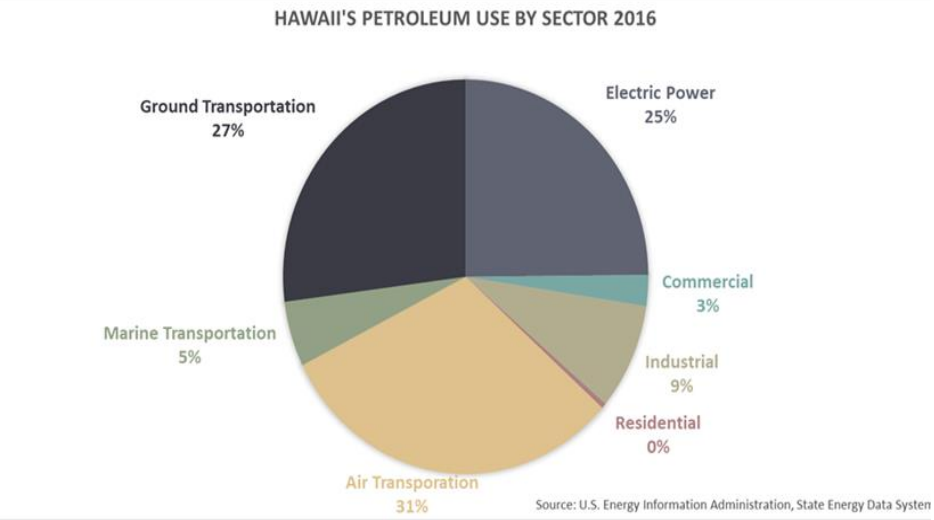
While deployment location will ultimately determine how the pursued Eligible Mitigation Actions impact air quality in those locations, HSEO estimates to expend nearly 70 percent of its Trust allocation on Eligible Mitigaiton Actions supporting the electrification of public transit, school buses, or government-owned transportation fleets that may be utlitzed by historically disadvantgaged communites, environmental justice communiteis of concern, and densely populated regions, regardless of deployment location.

[23] 2014 National Emissions Inventory, US EPA (https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data) Stationary emissions sources include electricity generation via combustion, airports, municipal waste combustors, petroleum refineries, quarries, and industrial facilities. As opposed to mobile emissions sources, stationary sources are more easily quantified and gives a broad understanding of areas and populations disproportionately affected by emissions before accounting for mobile sources. Figure 6 shows the areas in Hawaii most impacted by major stationary emissions sources.

## 4.2 Energy and Fuel Dependency

Hawaii's economy relies on imported fossil fuels for more than ninety percent of its total energy needs, making Hawaii the most petroleum-dependent state in the Union[24]. Hawaii also has electricity prices which are roughly two times higher than the national average[25]. Figure 7 shows that more than a quarter of all fossil fuel consumption in the State is consumed by the ground transportation sector.

**Figure 8: Hawaii's Petroleum Use by Sector 2016**




## 4.3 State Policies & Leadership

The challenges that come with such a high dependency on imported fuel have influenced Hawaii to take a strong stand on policies which support clean energy and the environment. Hawaii's clean energy transformation began with the establishment of the State Energy Office in 1978. Hawaii's current clean energy transformation policy is built on the foundation of the Hawaii Clean Energy Initiative (HCEI) which was launched in 2008 under a landmark partnership between the State of Hawaii and the U.S. Department of Energy. The initiative was reaffirmed in 2014 as a means of addressing and minimizing the State's reliance on imported fossil fuels.

[24] Hawaii Clean Energy Initiative, http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/state-and-regional-policy-assistanc-2; U.S. Energy Information Administration, https://www.eia.gov/state/analysis.cfm?sid=HI

[25] US Energy Information Administration. Electricity prices are highest in Hawaii but expenditures are highest in South Carolina. https://www.eia.gov/todayinenergy/detail.php?id=34932#

In 2015 the Hawaii State Legislature set a statutory provision to achieve 100 percent renewable energy in the electricity sector via a 100 percent Renewable Portfolio Standard (RPS) by 2045. The State is also aggressively pursuing energy efficiency to complement its renewable energy goals, and is increasingly focused on decarbonizing the ground transportation sector[26]. In support of these clean energy goals, Hawaii is committed to reducing greenhouse gas emissions in alignment with the principles adopted in the Paris Agreement[27]. In 2018 Governor Ige signed into law the following:

- Statewide carbon neutrality by 2045
- Statewide carbon offset program to reduce carbon emissions
- Greenhouse Gas Sequestration Task Force to identify policies and practices that increase sequestration and promote healthy natural and working lands

Governor Ige also declared his intention to join the Powering Past Coal Alliance[28] which brings together a diverse range of governments, businesses and organizations that are united in taking action to accelerate clean growth and climate protection through the rapid phase-out of traditional coal power.

The State's commitment to meeting a zero emissions clean economy by 2045 is aimed to mitigate greenhouse gas emissions by both reducing and sequestering atmospheric carbon and greenhouse gases produced within the State. The clean economy target is supportive of the State's commitment to the Paris Agreement, and, of specific relevance to the transportation sector, Hawaii's Act 38 which pursues "the ultimate elimination of Hawaii's dependence on imported fuels for electrical generation and ground transportation"[29]. Material progress towards the elimination of fossil fuels in ground transportation will greatly reduce the total

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[26] Energy planning objective of the Act 38, 2015, amendment of HRS 226-18 (a) (2) to read "Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawaii's dependence on imported fuels for electrical generation and ground transportation." http://www.capitol.hawaii.gov/hrscurrent/Vol04_Ch0201-0257/HRS0226/HRS_0226-0018.htm

[27] Hawaii is joining at least 12 other states that have formed the U.S. Climate Alliance and promised to remain committed to the goals in the Paris deal. In 2015, 195 countries agreed in Paris to set individual targets for reducing greenhouse gas emissions, with the shared goal of limiting the rise in average global temperatures to less than 2 degrees Celsius. https://www.capitol.hawaii.gov/session2017/bills/GM1132_.PDF https://www.capitol.hawaii.gov/session2017/bills/GM1132_.PDF

[28] Power Past Coal Alliance: Declaration. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/660041/powering-past-coal-alliance.pdf

[29] Pursuant to HRS 226-18(a)(2), planning for the State's facility systems regarding energy shall be directed toward the achievement of the following objectives, giving due consideration to increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawaii's dependence on imported fuels for electrical generation and ground transportation. https://www.capitol.hawaii.gov/hrscurrent/Vol04_Ch0201-0257/HRS0226/HRS_0226-0018.htm

volume of local carbon sequestration projects that would need to be sited and funded to achieve the 2045 clean economy target.

### 4.3.1 County Proclamations

Local county initiatives seek to build on Hawaii's state legislative actions. Most significantly, the mayors of Hawaii's four main counties jointly pledged to eliminate fossil fuels use from ground transportation by 2045 – mirroring the 100 percent RPS time frame, and pledged to transition all county fleet vehicles to 100 percent renewable power[30,31] by 2035.

# 5 HAWAII'S OVERALL GOAL FOR USE OF TRUST FUNDS

While the primary goal of the Trust is to reduce NOx emissions, beneficiaries may choose to consider how environmental mitigation trust funds could help achieve additional goals and policies related to economic development, health, fuel security, greenhouse gas emissions, energy, renewable portfolio standards, and benefits to vulnerable populations. Hawaii may adjust its goals and spending plans based on lessons learned during the implementation of the Trust. In accordance with the Trust agreement, beneficiaries may adjust their goals and specific spending plans at their discretion and, if they do so, shall provide the Trustee with updates to their Beneficiary Mitigation Plan[32].

In addition to fully mitigating the excess lifetime NOx emissions of the VW vehicles subject to the Settlement, the State of Hawaii's overall goal for the funds is to support projects which will aid the State in meeting many of Hawaii's clean energy goals including supporting "the ultimate elimination of Hawaii's dependence on imported fuels in ground transportation" per the State's planning goal[33].

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[30] City and County of Honolulu. Joint Press Release: Hawaii mayors commit to shared goal of 100 percent renewable ground transportation by 2045. December 2017. http://www.honolulu.gov/cms-csd-menu/site-csd-sitearticles/985-site-csd-news-2017-cat/29848-12-12-17-hawai%CA%BBi%E2%80%99s-mayors-commit-to-shared-goal-of-100-percent-renewable-ground-transportation-by-2045.html

[31] DBEDT's Hawaii Clean Energy Initiative Transportation Energy Analysis (HTEA) report, published in 2015, recommended 22 tactics that could potentially provide a reduction of 72 million gallons per year in fossil fuel consumption by 2030. The report identified procure EVs and efficient vehicles for public fleets has potential to reduce 0.4 to 1.0 million gallons of petroleum a year.

[32] DBEDT will create and maintain a public website for the duration of the Trust exclusively for its Trust activities: energy.hawaii.gov, under the Testbeds & Initiatives – Hawaii VW Environmental Mitigation Trust webpage. Attachment to "Certification for Beneficiary Status Under Environmental Mitigation Trust Agreement" Paragraph 7. Publicly Available Information, See appendix

[33] Pursuant to HRS 226-18(a)(2), planning for the State's facility systems regarding energy shall be directed toward the achievement of the following objectives, giving due consideration to increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawaii's dependence on imported fuels for electrical generation and ground transportation.

To support this goal, HSEO will prioritize Eligible Mitigation Actions that will make a transformational investment in Hawaii's clean energy economy with special emphasis on projects that facilitate the adoption and deployment of grid-connected EVs. Accelerating the adoption of EVs will reduce Hawaii's dependence on imported fossil fuels and serve as a high-visibility catalyst in advancing Hawaii's leadership in decarbonization of the electric and ground transportation sector. A focus on transformative investments, such as transitioning Hawaii's ground transportation from internal combustion engines to more fuel-efficient engines that can be powered by indigenous renewable resources, such as EVs, is a critical component to support Hawaii's carbon neutral and clean energy economy goals, reach 100 percent RPS, and fulfil the State's planning goals including the ultimate elimination of imported fuels in ground transportation.

# 6 HAWAII'S PROPOSED MITIGATION ACTIONS & PROGRAM ALLOCATIONS

This section of the Plan describes a high-level vision for the use of Hawaii's mitigation funds including categories of Eligible Mitigation Actions that Hawaii anticipates will be appropriate to achieve its stated goals, and Hawaii's preliminary assessment of the funds anticipated to be used for each Eligible Mitigation Action category[34].

HSEO established the categories and allocation amounts based on the following objectives:

- Availability of zero-emission technology;
- Impact on the transition toward the ultimate elimination of imported fuel in ground transportation; and,
- Present feasibility and market interest in Hawaii.

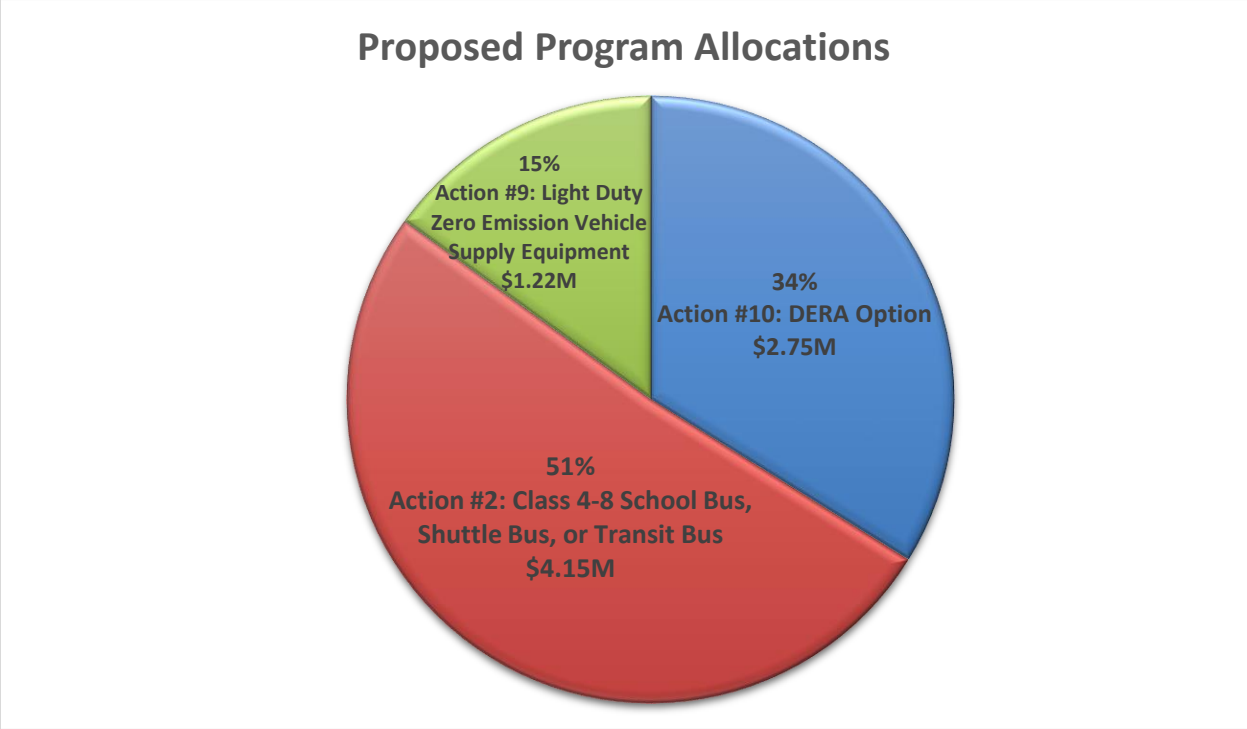
## 6.1 Proposed Mitigation Actions

HSEO proposes to allocate funds to three of the 10 Eligible Mitigation Action provided for by the Trust:

- Action #2: Class 4-8 School Bus, Shuttle Bus, or Transit Bus
- Action #9: Light Duty Zero Emission Vehicle Supply Equipment
- Action #10: Diesel Emission Reduction Act (DERA) Option

[34] The Trustee shall have no duty to monitor or supervise the use of Trust Funds paid in accordance with the Beneficiary's Eligible Mitigation Action Certification (Appendix D-4) and Funding Direction forms or any Beneficiary's compliance with an Eligible Mitigation Action. The Trustee may rely upon, with no further duty of inquiry, and shall be protected in acting upon, the certifications made by and delivered to it by the Beneficiaries. (See paragraph 3.5.4 of the Trust).

**Figure 9: Proposed Program Allocations for VW Trust Funds**




## 6.2 Program Allocations

HSEO's allocations of Trust funding provide an equitable opportunity to invest across a variety of geographic regions which encompass disadvantaged communities and densely populated regions of the State, aiding in the electrification of transportation.

HSEO is proposing to allocate:

- 51 percent for projects which electrify Class 4-8 School Buses, Shuttle Buses, or Transit Buses
- 34 percent for projects which contribute to Hawaii's Diesel Emission Reduction Act (DERA)

- 15 percent[35] for projects which facilitate the deployment of Light Duty Zero Emission Vehicle Supply Equipment[36]

Throughout the deployment of the Plan, funding may be reallocated to better meet demand, goals and objectives[37] and HSEO will submit Beneficiary Mitigation Plan updates to the Trustee as required. Also, during Plan implementation, HSEO will monitor Trust funds and each funding request will be made available to the public on HSEO's VW settlement webpage[38].

## 6.3 Proposed Mitigation Actions: Program Details, Impacts & Emission Benefits

This section describes the expected ranges of emission benefits Hawaii estimates would be realized by the implementation of the Eligible Mitigation Actions identified in the Plan and how Hawaii will consider the potential beneficial impact of the selected Eligible Mitigation Actions on air quality in areas that bear a disproportionate share of the air pollution burden within its jurisdiction.

### 6.3.1 Proposed Program: Electrification of Buses

Hawaii is proposing to allocate approximately 51 percent or $4.15 Million of its allocation of Trust Funds to Action #2: Electrify Class 4-8 School Buses, Shuttle Buses, or Transit Buses. HSEO is proposing to distribute Trust funds to County and/or State agencies based on their readiness to facilitate public transit or school bus electrification projects (battery electric buses). The demonstrated ability to sustainably operate, store, and maintain these projects over the long term also is a determining factor. Ideally these projects will be scalable and provide knowledge to assist with future bus electrification projects in Hawaii. As noted above, the affirmative goals and commitments in this sector promise to address a material component of the ground transportation sector which is available to serve a broad sector of the population, including environmental justice communities of concern, historically disadvantaged communities, and densely populated regions.

Promoting the electrification of government-owned transportation fleets through accelerated battery electric bus adoption: 1) is a tactic directly within the State's control; 2) demonstrates the State's leadership with action; and 3) is an essential step toward the decarbonization of

[35] Per the State Trust Agreement, fifteen percent of trust fund allocation is the maximum allowable amount that can be used on light duty electric vehicle charging infrastructure.
[36] For any Action, beneficiaries may use up to 15% of trust funds for administrative expenditures associated with implementing each Action. The allotted 15% administration cost has been incorporated into each Action investment noted in the "Proposed Program Allocations" chart in section 6.1.
[37] Note sections 5, 6.
[38] Hawaii DBEDT-HSEO. Volkswagen Settlement Overview webpage. http://energy.hawaii.gov/vw-settlement/vw

ground transportation in Hawaii. The State can efficiently create momentum for electrification by leveraging the VW funding to target mass transit which has market ready technology and 2035 fleet conversion goals by the counties. These funds can act as a catalyst in the ground transportation sector, spurring greater adoption and increasing confidence in the stability of the market and technology.

The desire is to leverage the Trust Funds to the extent feasible by covering the incremental cost of a battery electric transit or school bus. For government-owned eligible transit and school buses and privately-owned school buses under contract with a public school district, beneficiaries may draw funds from the Trust for 100 percent of the cost of a new battery electric bus, including associated charging infrastructure[39]. While project benefits and requirements will be evaluated individually, HSEO will look to the partnering agencies to contribute the funds that they would have otherwise spent on replacement combustion engine vehicles. With the assumption of a 75 percent cost match[40] by benefiting agencies, the allocated VW funds could result in up to 14 battery electric buses ($4.15 Million ÷ $300,000 ≈ 14 buses). The new battery electric buses must replace older diesel-powered buses to contribute to the Plan goals to improve air quality and provide socioeconomic benefits to communities in Hawaii. Therefore, partner agencies must dispose of the equipment (bus) to be replaced by Trust-funded project(s). The uses and geographic areas in which the new replacement buses will be operating will be identified in partnership with HSEO and the respective agency.

The electrification of buses program will be scalable in scope to demonstrate that owning and operating a battery electric public transit bus or battery electric school bus is viable. Projects with the electrification of buses program will help demonstrate the feasibility of converting to all electric buses in Hawaii and will aid the counties' commitments to decarbonize public transit by 2035[41].

The timing of the electrification of buses procurements will be coordinated with state and county agencies depending on their readiness. The priority is to work with government fleets.

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[39] Case 3:16-cv-00295-CRB Document 51-1 Filed 10/02/17 Page 55 of 80. https://www.vwenvironmentalmitigationtrust.com/sites/default/files/2018-05/Final%20Filed%20Dkt%2051-1%20%20State%20Beneficiary%20Trust%20Agreement_0.pdf

[40] Note that the 75% cost match is illustrative in nature and assumes Trust funds will be used to cover the incremental cost of purchasing a battery electric bus over a diesel bus. This assumes a battery electric bus cost of $750,000 and a diesel bus cost of $500,000; utilizing Trust funds to cover the incremental cost of roughly $250,000. A 20% contingency factor is then applied to account for supply equipment as well as administrative costs for a proposed contribution of Plan funds of roughly $300,000. The exact percentage of cost match that will be targeted will be the result of additional due diligence for specific projects with the participating agencies and market participants.

[41] City and County of Honolulu Proclamation, December 2017. https://static1.squarespace.com/static/59af5d3cd7bdce7aa5c3e11f/t/5aa968fcc8302559ab8fdcab/1521051904681/Honolulu%2BProclamation%2B100%2525%2BRenewable%2BGround%2BTransportation%5B1%5D.pdf

If, however, circumstances and market demand necessitate, the battery electric program will explore private fleets.

It is the intention of the electrification of buses program to build on lessons learned throughout the deployment. To that end the collection and reporting of operating information and best practices will be incorporated where appropriate.

#### 6.3.1.1 Activities to Date

Electric transit buses are a market ready segment of the eligible medium-duty and heavy-duty vehicles in the VW settlement which have a significant footprint in public fleets and are being actively explored in Hawaii.

According to the California Air Resource Board's (CARB) most recent assessment, both transit and shuttle e-buses have reached the commercial stage. CARB reports that all major North American bus makers are producing full-sized battery-electric transit buses, and nearly 20 different models are available[42]. CARB characterizes these transit buses as a "beachhead technology" that will serve as a launch point for development of battery electric shuttle buses, school buses, and delivery vehicles[43].

In 2017 the Honolulu City Council directed the Department of Transportation Services to adopt an electric bus transition plan[44]. Also in 2017 the City and County of Honolulu was awarded a Federal Transit Administration (FTA) Low or No-Emission (Low-No) Bus Program grant to fund Gillig battery electric buses with depot chargers in the Honolulu area as their inaugural project to transition their fleet to zero emission. This grant project is unique in that the buses will be charged during the day to take advantage of the renewable energy made available by the abundant solar and wind energy available on the island[45]. In early 2018 the City and County of Honolulu demonstrated its first battery electric buses on loan from Proterra, Inc., and BYD. In 2018 The Hawaii State Department of Transportation was awarded a Low-No Bus Program grant to purchase battery electric buses and charging stations to support battery electric buses in rural areas statewide[46].

The Hawaii State Department of Education (HIDOE) contracts most of its bus service needs through private vendors, none of which are currently using electric school buses, and current

[42] California Air Resources Board, 2017. "Proposed Fiscal Year 2017-18 Funding Plan for Clean Transportation Incentives" https://www.arb.ca.gov/msprog/aqip/fundplan/proposed_1718_funding_plan_nal.pdf (p. 17)
[43] ibid p. II-36
[44] City Council City and County of Honolulu, Resolution No 17.237. "Urging the City Administration to Implement a Pilot Program, adopt a Comprehensive Transition Plan and Move to all Zero-Emission Electric Buses."
[45] https://www.transit.dot.gov/funding/grants/fiscal-year-2017-low-or-no-emission-low-no-bus-program-projects
[46] https://www.transit.dot.gov/funding/grants/fiscal-year-2018-low-or-no-emission-low-no-bus-program-projects

State contract agreements do not prescribe electric buses. HIDOE, however, has expressed a willingness and sincere interest to explore opportunities with HSEO to electrify school buses.

Hawaiian Electric Company (HECO) is currently collaborating with the Electric Power Research Institute to conduct a 3-year pilot project to test and demonstrate a battery electric school bus. HECO will work in partnership with a private bus service provider, contracted to provide mobility services for the HIDOE, with the provider operating the electric school bus on two different fixed commuter routes to collect performance and energy utilization data. The electric school bus then will be provided to an independent private school to be used on two different fixed commuter routes.

#### 6.3.1.2 Expected Impacts and Benefits

Battery electric buses of all types have strong potential to support the early adoption of zero-emission technology, increase economies of scale to help bring down local operational costs, and reduce harmful exposure for some of the State's most sensitive populations: children, elderly, disabled, and disadvantaged citizens who depend on public transportation in some manner for their living needs. By investing in transit and school bus electrification, Hawaii would be providing direct benefits to populations that may not most directly benefit from EV charging of individually owned light-duty EVs. Heavy-duty battery electric buses can provide both direct and indirect public health and social welfare benefits for transportation users and many surrounding communities[47].

Battery electric vehicles have zero tailpipe emissions; however the reduction in NOx emissions achieved by switching from diesel to EVs will vary based on the fuel mix of the electric power generation supplied to the grid. The analysis conducted for this Plan utilized the Energy Information Administration's (EIA) NOx emissions factor for power generation in Hawaii (3.6 lbs NOx per MWh). NOx emissions reduction ranges for transit buses and school buses are estimated below using both tailpipe emissions and power generation emissions. It is important to note as the state moves to 100% renewable energy in the electric sector, NOx emissions from power generation will be further reduced.

**Tailpipe Emissions**

Emissions reduction estimates for the replacement of a diesel transit bus and diesel school bus with a battery electric transit/school bus were calculated using the EPA's Diesel Emissions Quantifier (DEQ) online tool[48]. The DEQ calculates emissions as tailpipe emissions (zero for electric buses) and does not include emissions from power generation. Essentially, with the

[47] Emissions from diesel engines contribute to the production of ground-level ozone which is created by chemical reactions between NOx and volatile organic compounds.

[48] Diesel Emissions Quantifier, US EPA, https://cfpub.epa.gov/quantifier/index.cfm?action=main.home

DEQ, emissions reductions achieved with an electric bus are equal to the emissions from the bus that is being replaced.

Using the baseline assumptions of a model year 1998 diesel transit bus, 25,000 annual vehicle miles traveled and 7,000 gallons of annual diesel fuel usage,[49] a battery electric transit bus replacement would result in an annual NOx reduction of 0.644 tons/year. Using baseline assumptions of a model year 1998 diesel bus, 7,800 annual vehicle miles traveled and 1,300 gallons of annual diesel fuel usage,[50] a battery electric school bus replacement would result in an annual NOx reduction of 0.13 tons/year (see Figures 10 and 11).

**Power Generation Emissions**

When factoring in the emissions from power generation in Hawaii,[51] it is estimated that a battery electric transit bus, driven 25,000 miles per year, would account for annual NOx emissions in the range of 0.07 – 0.09 tons, which is less than 15 percent of the emissions of the baseline diesel vehicle. It is estimated that an electric school bus being driven 7,800 miles per year would account for emissions of nitrogen oxides in the range of 0.02 – 0.022 tons, which is less than 20 percent of the emissions of the baseline diesel vehicle.

As power generation reduces emissions through the achievement of renewable energy goals, battery electric buses will become increasingly cleaner to operate.

**Figure 10: Diesel Emissions Quantifier for Transit Bus Replacement**

| Transit Bus Annual Emissions | Tons NOx (per vehicle) | Tons NOx (14 buses) |
|---|---|---|
| **Diesel Transit Bus** | 0.644 | 9.016 |
| **Battery Electric Transit Bus (tailpipe emissions)** | 0 | 0 |
| **Battery Electric Transit Bus (accounting for power generation emissions)** | 0.07 – 0.09 | 0.98 – 1.26 |
| **Transit Bus NOx Savings Range** | 0.554 – 0.644 | 7.756 – 9.016 |

**Figure 11: Diesel Emissions Quantifier for School Bus Replacement**

| School Bus Annual Emissions | Tons NOx (per vehicle) | Tons NOx (14 buses) |
|---|---|---|
| **Diesel School Bus** | 0.13 | 1.82 |

[49] VMT and fuel usage assumptions for a transit bus from the *Hawaii Four Counties Draft VW Funding Concept*.
[50] Assumptions based on total VMT, total fuel consumption, and average age of school bus fleet provided by DOE.
[51] Based on EIA 2016 Hawaii statistics, Hawaii Electricity Profile 2016, EIA (https://www.eia.gov/electricity/state/hawaii/). Nitrogen Oxide emissions are 3.6 lbs/MWh

| | | |
|---|---|---|
| **Battery Electric School Bus (tailpipe emissions)** | 0 | 0 |
| **Battery Electric School Bus (accounting for power generation emissions)** | 0-.020 – 0.022 | 0.28 – 0.308 |
| **School Bus NOx Savings Range** | 0.108 - 0.13 | 1.512 – 1.82 |

There are additional benefits to the electrification of ground transportation in Hawaii. If electric vehicle charging loads are synchronized with periods of high renewable energy generation, ground transportation can be fueled with renewable energy that may otherwise be curtailed. Smart charging of ground transportation also may help reduce the need for grid-scale energy storage, potentially lowering the cost of achieving 100 percent renewable energy in the electric sector.

### 6.3.2 Proposed Program: Expansion of EV Charging Equipment

HSEO plans to allocate 15 percent or $1,218,750 of its Trust fund allocation on the costs necessary for, and directly connected to, the acquisition, installation, operation and maintenance of new EV charging stations, for projects described in Action #9: Light Duty Zero Emission Vehicle Supply Equipment[52].

Hawaiian Electric Company's Electrification of Transportation (EoT) "Strategic Roadmap" estimates that 55 percent of personal light-duty vehicles on Oahu roads in 2045 are projected to be fully electric, supported by approximately 2,200 public charging ports. Achieving 55 percent will reduce annual fossil fuel consumption on Oahu for light-duty transportation by 56 percent in 2045[53].

For EVs to be a ubiquitous option for Hawaii's drivers, there needs to be an infrastructure of publicly available EV chargers in a diversity of locations, understanding that 1) not all EV drivers have access to residential or workplace parking (and thereby associated EV charging) and, 2) it

[52] Appendix D-2 of the State 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. 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).

[53] In March 2018 the Hawaiian Electric Companies submitted their Electrification of Transportation (EoT) Strategic Roadmap (Roadmap). The Roadmap describes a number of steps to accelerate the EoT, including: (1) increasing EV adoption by helping to lower costs and educating customers; (2) accelerating the buildout of EV charging infrastructure; (3) supporting the electrification of buses and other heavy equipment; (4) incentivizing EV charging to align with grid needs and save drivers and utility customers money; and (5) coordinating with ongoing grid modernization and planning efforts to help maximize the use of renewable resources. https://www.hawaiianelectric.com/Documents/clean_energy_hawaii/electric_vehicles/201803_eot_roadmap.pdf

is a strategic investment to fill in critical gaps in the public charging network in locations where there has not been a business case for third-party providers to install and reliably maintain charging[54].

HSEO understands there is a current shortage of EV charging stations across the State; for every 12.5 EVs there is one publicly available EV charging port. These ratios are high relative to the EoT Roadmap and DBEDT[55] future EV and charging station port forecasts/targets[56]. EV charging installations will need to keep on pace to align with the projected EV adoption rate.

HSEO will consider the following when allocating funds to EV charging infrastructure projects[57]:

i) Support statewide EV charging network connectivity infrastructure needs:

HSEO looks to allocate a portion of the Trust funding to support the expansion of Hawaii's EV charging network, specifically to areas not yet serviced, ideally along Hawaii's federally recognized Alternative Fuel Corridors[58] within the City and County of Honolulu, County of Hawaii, and Maui County[59]. HSEO, in partnership with Kauai County, is actively seeking ways to create an alternative fueling corridor on the island of Kauai to allow for increased adoption of EVs and alternative fuel transportation options. Funding allocation for EV charging infrastructure will be determined on a project-by-project basis, taking into consideration EV adoption rates, existing charging station ports, and stakeholder engagement.

ii) Support State of Hawaii's light-duty fleet transition to EVs:

HSEO looks to allocate a portion of the Trust funding to support EV charging infrastructure in strategic locations which support the state and county governments' fleets transition to EVs. Consideration will be given to EV charging site locations that serve the needs of both public fleets and private personal EVs to maximize the use of the infrastructure and increased EV adoption.

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[54] Hawaiian Electric Company, Inc. March 2018. "Electrification of Transportation – Strategic Roadmap" (Page 86)

[55] Hawaii Clean Energy Initiative Transportation Energy Analysis Final Report August 2015

[56] Hawaiian Electric Company, Inc. March 2018. "Electrification of Transportation – Strategic Roadmap" 55 percent of personal LDVs on Oahu roads in 2045 are projected to be fully electric, supported by approximately 2,200 public charging ports.

[57] DBEDT supports a near term investment in *both* Level 2 and Fast Charging infrastructure

[58] "Additional Hawaii Roadways Designated as Alternative Fuel Corridors". March 2018. http://dbedt.hawaii.gov/blog/18-24/

[59] U.S. Department of Transportation Federal Highway Administration. Alternative Fuel Corridors – All Designated Corridors by State. https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/all_corridors/

EV charging infrastructure locations may include, but are not limited to:

- State or county government employee workplace charging, [60]
- State or county-owned public lots, and
- EV fast charging plazas/hubs to be shared and made available to both State fleets and private vehicles.

#### 6.3.2.1 Activities to date

HSEO has taken a leadership role in advancing the adoption of clean transportation across Hawaii, including facilitation of the deployment of zero emission vehicles and associated charging infrastructure which directly contribute to reduced petroleum consumption and emissions in the transportation sector[61]. To achieve the transition to a decarbonized transportation sector, HSEO works with federal, state and county agencies, energy stakeholders, clean transportation stakeholders, and the local community to encourage and facilitate adoption of clean transportation.

Hawaii's EV sales rank second in the nation behind California in the percentage of total State passenger vehicle sales[62]. In July 2018, the number of passenger EVs in the state was 7,497, an increase of 1,413 vehicles, 23 percent, from 2017, and an increase of 148 vehicles, 2 percent, from June 2018. To date, Hawaii has over 250 EV charging stations yielding roughly 478 charging ports[63].

Listed below are laws, and regulations related to EVs for Hawaii[64,65]:

- Free parking is provided in state and county government lots, facilities, and at parking meters.
- Vehicles with EV license plates are exempt from High Occupancy Vehicle lane restrictions.

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[60] US DOE data suggests that employees with workplace charging are six times more likely to purchase an EV. Supporting workplace charging complements efforts of renewable integration and lower distribution grid impacts

[61] Funded by the American Recovery and Reinvestment Act (ARRA), in 2012 HSEO completed The Hawaii EV Ready program which provided 455 rebates for EVs, and 279 charger rebates. The Program also facilitated the installation of over 230 charging sites at more than 95 public locations statewide.

[62] Alliance of Automobile Manufacturers. https://autoalliance.org/economy/consumer-choice/electric-vehicles/HI/, Additional information is also available at: https://autoalliance.org/energy-environment/advanced-technologyvehicle-sales-dashboard/

[63] Based on numbers provided by the U.S. DOE Alternative Fueling Station Locator & DBEDT's EV Stations Hawaii

[64] Hawaii DBEDT-HSEO. State and Federal Laws and Incentives webpage. http://energy.hawaii.gov/testbeds-initiatives/ev-ready-program/laws-incentives

[65] Hawaiian Electric Company. Electric Vehicles webpage. https://www.hawaiianelectric.com/clean-energy-hawaii/electric-vehicles

- Parking lots with at least 100 public parking spaces are required to have at least one parking space, equipped with an EV charging system, reserved exclusively for EVs.
- Non-EVs parked in a space designated and marked as reserved for EVs shall be fined not less than $50 nor more than $100.
- Hawaiian Electric Company offer EV Time of Use Rates designed to incentivize customers, through lower rates, to charge their EVs during off-peak times of day.
- Multi-family residential dwellings or townhomes cannot prohibit the placement or use of EV charging systems altogether.

#### 6.3.2.2 Expected Impacts & Benefits

It is estimated that EVs will reduce annual fossil fuel consumption on Oahu for light-duty transportation by 56 percent in 2045[66]. The expected benefits of increasing investments in light-duty EV charging infrastructure is emission reductions associated with increased EV adoption and usage[67]. The actual amount of emissions reduction EVs provide is dependent on when and where drivers charge the vehicles. Continued analysis of charging behavior contributes to an understanding of the degree to which a particular electric charging pattern, vehicle type, and renewable energy portfolio composition impact emissions from light-duty EVs[68]. To avoid double-counting emission benefits, this plan will not quantify direct NOx reductions which is consistent with California's beneficiary mitigation plan[69].

### 6.3.3 Proposed Program: Diesel Emission Reduction Act

HSEO proposes to leverage roughly 34 percent, $2.75 million, of its Trust allocation to Action #10: Diesel Emission Reduction Act (DERA) option to take advantage of the US Environmental Protection Agency (EPA) matching bonus incentive. Under the DERA option, beneficiaries can leverage DERA funds to replace diesel buses, trucks, and off-road vehicles with low-emitting alternatives. Under the DERA option, beneficiaries may match the annual allocation dollar-for-dollar and receive a bonus amount of EPA DERA funding (50 percent of the base allocation).

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[66] Hawaiian Electric Company, Inc. March 2018. "Electrification of Transportation – Strategic Roadmap" Page 38, Analysis by E3 using Hawaiian Electric's EV adoption forecast.

[67] U.S. DOE Office of Energy Efficiency and Renewable Energy, "Reducing Pollution with Electric Vehicles," https://energy.gov/eere/electricvehicles/reducing-pollution-electric-vehicles. EPRI, September 2015, "Environmental Assessment of a Full Transportation Portfolio, Volume 3: Air Quality Impacts," https://www.epri.com/#/pages/product/3002006880/

[68] Emissions Associated with Electric Vehicle Charging: Impact of Electricity Generation Mix, Charging Infrastructure Availability, and Vehicle Type Joyce McLaren, John Miller, Eric O'Shaughnessy, Eric Wood, and Evan Shapiro National Renewable Energy Laboratory Prepared under Task No. VTP2.0100

[69] California Air Resources Board. Volkswagen Settlement – Environmental Mitigation Trust for California webpage. https://www.arb.ca.gov/msprog/vw_info/vsi/vw-mititrust/vw-mititrust.htm

HSEO intends to leverage Hawaii's annual DERA allocation [70] by using Trust funds as the non-federal *voluntary* match to receive the DERA EPA match incentive. HSEO has allocated enough funds to provide for the incremental cost associated with roughly 16 buses[71]. By taking advantage of the EPA match incentive to receive an additional 50 percent of the voluntary match from the EPA, HSEO could increase the overall funds coming to Hawaii by roughly 17 percent or $1.375 million. Adding the DERA EPA match incentive to the Plan budget for the DERA Program of $2.75 million results in incremental contribution to the procurement of battery electric buses in Hawaii of $4.125 million.

#### 6.3.3.1 Activities to Date

The EPA's Clean Diesel Program provides funding from the Diesel Emissions Reduction Act[72] to support projects that protect human health and improve air quality by reducing harmful emissions from diesel engines. Under DERA, 30 percent of appropriation is allocated to states and territories to fund projects and rebate and grant programs to replace diesel buses, trucks, and off-road vehicles with low-emitting alternatives. Base funding is distributed to states and territories using a formula based on overall participation. The Hawaii State Department of Health's Clean Air Branch (DOH-CAB) administers the DERA grant funds for the State of Hawaii and has received DERA program allocations since 2008[73].

Hawaii DOH-CAB submitted project proposals for 2017 and 2018 DERA funds, which will provide up to 45 percent of the cost to replace three government-owned heavy-duty diesel vehicles (such as transit buses, school buses, or shuttle buses) with battery electric transit buses.

#### 6.3.3.2 Expected Impacts & Benefits

Currently Hawaii DOH-CAB has a proposed project to replace three heavy-duty diesel vehicles aims to reduce emissions, improve air quality, and protect public health in targeted residential, rural, and school zones in Hawaii that are more susceptible to criteria air pollutants. Exposure to diesel exhaust can lead to serious health conditions such as asthma and respiratory illnesses and can worsen existing heart and lung diseases, especially in children and the elderly. According to the most recent Hawaii Health Survey, the prevalence of asthma in those 65 years and older has steadily increased since 1998[74]. Diesel vehicle and engine replacements would

[70] DERA state allocations. https://www.epa.gov/cleandiesel/2008-2017-state-allocations-agencies
[71] This assumes that roughly 85% of the incremental costs would be a direct result of funding from the Plan with the remaining 15% provided through the DERA EPA Base Allocation funds.
[72] Energy Policy Act of 2005. https://www.gpo.gov/fdsys/pkg/PLAW-109publ58/pdf/PLAW-109publ58.pdf
[73] Hawaii did not participate in 2012 and 2013. https://www.epa.gov/cleandiesel/2008-2017-state-allocations-agencies
[74] Hawaii Health Survey 2012. Number of Persons with Asthma. http://health.hawaii.gov/hhs/files/2015/07/4.2.-Number-of-Persons-With-Asthma-%E2%80%93-Age-By-Gender-and-Ethnicity-%E2%80%93-Population-of-Hawaii-Table-and-Figure.pdf

reduce diesel particulate matter and greenhouse gas emissions benefitting this group of elderly residents and improving Hawaii's air quality. The resulting emissions benefits from the EPA match incentive resulting from the utilization of the Plan's DERA program for non-federal voluntary match could effectively increase the Plans DERA Program emission benefits by 50 percent.

The estimated reduction in NOx emissions can be found in the tables below:

**Figure 12: Diesel Emissions Quantifier for Transit Bus Replacement**

| Transit Bus Annual Emissions | Tons NOx (per vehicle) | Tons NOx (16 buses) |
|---|---|---|
| **Diesel Transit Bus** | 0.644 | 10.304 |
| **Battery Electric Transit Bus (tailpipe emissions)** | 0 | 0 |
| **Battery Electric Transit Bus (accounting for generator emissions)** | 0.07 – 0.09 | 1.12 – 1.44 |
| **Transit Bus NOx Savings Range** | 0.554 – 0.644 | 8.864 – 10.304 |

**Figure 13: Diesel Emissions Quantifier for School Bus Replacement**

| School Bus Annual Emissions | Tons NOx (per vehicle) | Tons NOx (16 buses) |
|---|---|---|
| **Diesel School Bus** | 0.13 | 2.08 |
| **Battery Electric School Bus (tailpipe emissions)** | 0 | 0 |
| **Battery Electric School Bus (accounting for generator emissions)** | 0-.020 – 0.022 | 0.32 – 0.352 |
| **School Bus NOx Savings Range** | 0.108 - 0.13 | 1.728 – 2.08 |

# 7 APPENDIX

# 7.1 Request for Public Comment regarding Volkswagen Environmental Mitigation Trust

# Request for Public Comment regarding Volkswagen Environmental Mitigation Trust

In 2017 the U.S. District Court Northern District of California approved the Trust Agreement settling claims by the U.S EPA and the Federal Trade Commission against German automaker, Volkswagen Group (VW). The civil complaint filed against VW claimed that the automaker installed software in its 2.0 and 3.0 liter diesel engine vehicles to disable emission controls under normal use and to turn on emission controls only when the vehicle was being tested. This "defeat device" was designed to show better real world fuel mileage and driving performance, but in reality resulted in the release of thousands of tons of nitrogen oxide (NOx) emissions in excess of roughly 40 times the amounts allowed under the U.S. Clean Air Act regulated limits. As part of a multi-billion dollar settlement, the United States v. Volkswagen Group of America et al., requires VW to invest $2.7 billion in an independently administered Environmental Mitigation Trust, which will fund projects to reduce diesel emissions. The Environmental Mitigation Trust Agreement for State Beneficiaries provides a list of the mitigation projects eligible for funding.

The Environmental Mitigation Trust fund is distributed among states, territories, and federally recognized Indian tribes based on the proportion of affected VW diesel vehicles registered in each jurisdiction. The Department of Business, Economic Development, and Tourism (DBEDT) has been designated by Governor Ige to serve as the Lead Agency on behalf of Hawaii as a Beneficiary, and the Hawaii State Energy Office, a division of DBEDT, will administer Hawaii's $8.125 million Environmental Mitigation Trust allocation, including the determination and execution of the eligible mitigation projects to be funded by the Trust. The Settlement requires Trust funds to be allocated towards projects that replace or retrofit medium and heavy-duty vehicles or equipment with cleaner options. Additionally, up to 15% of the funds can be used to install electric vehicle charging stations around the state.

The Hawaii State Energy Office has developed the following online questionnaire to solicit and consider public input, prior to the filing of its Plan, regarding Hawaii's utilization of Volkswagen Environmental Mitigation Trust fund. Public input submitted is for the purpose of gathering initial input on how these funds could be used and will be considered and incorporated as practicable. Names and identifying information, if provided in the optional responses below, will be kept confidential. All submitted comments will be aggregated and made available as a public resource.

More information about the settlement and submitted input can be found at energy.hawaii.gov/vw,

---

## DEMOGRAPHIC INFORMATION

1. **Name (optional)**

2. **E-mail (optional)**

3. **Zip Code**

4. **Are you employed in the public, private, or non-profit sector?**

- ○ Public
- ○ Private
- ○ Non-Profit
- ○ N/A

## ELIGIBLE FLEET PROJECT TYPES

Through the Environmental Mitigation Trust, Hawaii may support projects that fall within ten eligible mitigation action categories. Most of the mitigation actions revolve around repowering and replacing medium and heavy marine and land vehicles with new vehicles or engines that use a variety of fuels. While the primary goal of the environmental mitigation trust is to reduce NOx emissions, beneficiaries may choose to consider how Environmental Mitigation Trust funds could help achieve additional goals and policies related to economic development, health, fuel security, greenhouse gas emissions, energy, renewable portfolio standards, and benefits to vulnerable populations. The State looks to apply Trust funds to make market transformative investments that will reduce NOx emissions in the transportation sector, and reduce Hawaii's dependency on imported fossil fuels within the transportation sector.

5. **Which of the following Eligible Mitigation Action categories should Hawaii consider for Trust funding? (Rank in order of priority, 1 – Highest Priority, 8 – Lowest Priority)**

- ○ Class 8 Local Freight Trucks and Port Drayage Trucks (Eligible Large Trucks)
- ○ Class 4-8 School Buses, Shuttle Buses, or Transit Buses
- ○ Freight Switchers (not applicable to Hawaii)
- ○ Ferries/Tugs
- ○ Ocean Going Vessels Shorepower
- ○ Class 4-7 Local Freight Trucks (Eligible Medium Trucks)
- ○ Airport Ground Support Equipment
- ○ Forklifts and Port Cargo Handling Equipment
- ○ Light Duty Zero Emission Vehicle Supply Equipment
- ○ Diesel Emission Reduction Act (DERA) Option (Beneficiaries may use Trust Funds for their non-federal voluntary match eligible of the DERA grant)

6. **To reduce and utlimately eliminate Hawaii's dependence on imported fuels for electrical generation and ground transportation, which of the following**

transportation alternative fuels and advanced technologies **should Hawaii give priority to? (Rank in order of priority, 1 – Highest Priority, 5 – Lowest Priority)**

- ○ Biodiesel
- ○ Electricty
- ○ Ethanol
- ○ Hydrogen
- ○ Natural Gas
- ○ Propane

7. **What specific fleets should be targeted for Trust funding? (Rank in order of priority, 1 – Highest Priority, 7 – Lowest Priority)**

- ○ Nonprofit fleets
- ○ County government fleets
- ○ State government fleets
- ○ Federal government fleets
- ○ Private business fleets
- ○ Other _____

**Please submit any additional comments and/or information regarding Eligible Mitiagation Project Types below (limit 200 words):**

| |
|---|
| |

## ELIGIBLE CONSUMER PROJECTS

Up to fifteen percent (15%) of Hawaii's allocation of Environmental Mitigation Trust funds can be directed towards the costs necessary for, and directly connected to, the acquisition, installation, operation and maintenance of new light duty zero emission vehicle supply equipment. 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).

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.

8. **Which of the following sites would best help to fill the gaps in Hawaii's electric vehicle charging network? (Rank in order of priority, 1 – Highest Priority, 6 – Lowest Priority)**

- ○ Charging at apartment buildings, townhomes, or other multi-family housing
- ○ Charging at work
    - ○ Private employee parking
    - ○ Public employee parking
    - ○ Commerical parking – daily parking lots
- ○ Charging at private businesses (grocery stores, shopping centers, etc)
- ○ Charging at municipal and state parking lots (Iolani Palace, regional parks, State Capitol, etc)
- ○ Expanding charging ports (adding additional chargers) at existing charging locations
- ○ Other _____

**9. For the #1 priority site you selected above, what level of charging would be preferred?**

- ○ **Level 1 Charger** – 120 volt outlet, usually taking 8-20 hours to fully charge a plug-in electric vehicle (PEV)
- ○ **Level 2 Charger** – 240 volt electric circuit, usually taking 4-8 hours to fully charge a PEV
- ○ **Level 3 (DC Fast Charger)** – 480 volt electric circuit, usually taking 30-40 minutes to fully charge a PEV

**Please submit any additional comments and/or information regarding ZEV Investments below (limit 200 words):**

## ENVIRONMENTAL MITIGATION TRUST PROJECT GOALS

While the primary goal of the Environmental Mitigation Trust is to reduce NOx emissions, beneficiaries have a unique opportunity to invest in forward thinking projects that have the potential to transform markets and achieve significant gains in clean transportation. Beneficiaries may choose to consider how environmental mitigation trust funds could help achieve additional goals and policies related to economic development, health, fuel security, greenhouse gas emissions, energy, renewable portfolio standards, and benefits to vulnerable populations.

**10. Which of the following goals should Hawaii give the highest priority to? (Rank in order of priority, 1 – Highest Priority, 4 – Lowest Priority)**

- ○ **Transformation** – Market transformation and tranformative investments of energy efficiency, renewable energy, and integrated transportation technologies (i.e. connectivity between different tansport modes and services) supporting the transformation to a clean energy economy.
- ○ **Electrification** – With the state's goal to reach 100 percent renewable energy generation by 2045, looking at the adoption and widespread deployment of electric drive vehicles, alternative transportation (e.g. walking and biking), and multi-modal transportation (e.g. public transit and ride-sharing) solutions will help to address the challenges of modernizing our energy system and building a clean transportation future
- ○ **Greenhouse Gas Reduction** - In 2007, Hawaii became the second state in the Nation to set a binding cap on greenhouse gas (GHG) emissions through Act 234, which declared a policy to reduce GHG emissions statewide to 1990 levels by the year 2020. Additionally in 2017, Act 032 commits the state to reducing GHG emissions to align with the principles and goals of the Paris Agreement.
- ○ **Nitrogen Oxide Reduction** – A primary emission of concern produced by the non-compliant vehicles, Nitrogen Oxide, is a significant health concern that contributes to the formation of smog and is linked to numerous respiratory and cardiovascular related health effects.
- ○ **Environmental Justice** – Give priority to environmental justice concerns in relation to low and moderate income areas and areas with elevated occurrences of childhood asthma

## ADDITIONAL COMMENTS

**11. May we contact you for future information on clean transportation?**

- ○ Yes
- ○ No

**Please submit any additional comments and/or information regarding Hawaii's VW settlement below (limit 200 words):**

**If you would like to provide more feedback to the HSEO as we develop our plan, please send your comments to dbedt.vwsettlement@hawaii.gov.**

## 7.2 NOx Emissions Calculations

**Transit Bus**

*DEQ Results – Diesel Transit Bus replacement with Electric Transit Bus*

Emissions reductions estimates for the replacement of a diesel transit bus with a battery electric bus transit bus were first calculated using the EPA's Diesel Emissions Quantifier (DEQ) online tool[1]. Using baseline assumptions of a model year 1998 diesel bus, 25,000 annual vehicle miles traveled and 7,000 gallons of diesel annual usage[2], an electric transit bus replacement would result in an annual NOx reduction of 0.6443 short tons/year (see DEQ results below). The DEQ calculates emissions for a replacement electric transit bus as tailpipe emissions and does not include emissions from the electric grid.

| **Annual Results (tons)** | **NOx** |
|---|---|
| Diesel Transit Bus Baseline | 0.644 |
| Electric Transit Bus Tailpipe Emissions | 0 |

*Nitrogen Oxide Emissions from Operating Electric Bus Replacement Powered by Electric Grid*

When factoring in the emissions from power generation in Hawaii[3] (based on EIA 2016 Hawaii statistics), it is estimated that an electric transit bus being driven 25,000 miles per year would account for annual emissions of nitrogen oxides in the range of 0.07 – 0.09 tons or under 15% of the emissions of the baseline diesel vehicle. As power generation reduces emissions through the achievement of renewable energy goals, electric buses will become increasingly clean to operate.

| **Annual Results (tons)** | **NOx** |
|---|---|
| Electric Transit Bus Emissions | 0.07 - 0.09 |

*Calculations*[4]

$$Tons\ NOx/vehice/yr\ = \frac{\left(\frac{VMT}{range}\right) * kWh\ full\ charge}{1000} * \left(\frac{3.6\ lbs\ NOx}{MWh}\right) * \left(\frac{453.6\ g}{lb}\right) * \left(\frac{ton}{907{,}200g}\right)$$

*TheBus Fleet*

| | |
|---|---|
| Fixed Route Buses | 542 |
| Less than 40' | 38 |
| Standard Bus 40' | 389 |
| Articulated Bus 60' | 115 |
| Average Age | 9.5 |
| TheHandi-Van Fleet | 180 |

[1] Diesel Emissions Quantifier, US EPA (https://cfpub.epa.gov/quantifier/index.cfm?action=main.home)
[2] VMT and fuel usage assumptions for a transit bus from the *Hawaii Four Counties Draft VW Funding Concept*.
[3] Hawaii Electricity Profile 2016, EIA (https://www.eia.gov/electricity/state/hawaii/). Nitrogen Oxide emissions are 3.6 lbs/MWh.
[4] Range of NOx emissions calculated using Proterra and BYD 40' EV Transit Bus specifications.

**School Bus**

*DEQ Results – Diesel School Bus replacement with Electric School Bus*

Emissions reductions estimates for the replacement of a diesel school bus with a battery electric bus school bus were calculated using the EPA's Diesel Emissions Quantifier (DEQ) online tool. Using baseline assumptions of a model year 1998 diesel bus, 7,800 annual vehicle miles traveled and 1,300 gallons of diesel annual usage[5], an electric school bus replacement would result in an annual NOx reduction of 0.13 short tons/year (see DEQ results below). The DEQ calculates emissions for a replacement electric school bus as tailpipe emissions and does not include emissions from the electric grid.

| **Annual Results (tons)** | **NOx** |
|---|---|
| Diesel School Bus Baseline | 0.13 |
| Electric School Bus Tailpipe Emissions | 0 |

*Nitrogen Oxide Emissions from Operating Electric Bus Replacement Powered by Electric Grid*

When factoring in the emissions from power generation in Hawaii (based on EIA 2016 Hawaii statistics), it is estimated that an electric school bus being driven 7,800 miles per year would account for emissions of nitrogen oxides in the range of 0.02 – 0.022 tons or under 20% of the emissions of the baseline diesel vehicle. As power generation reduces emissions through the achievement of renewable energy goals, electric buses will be even cleaner to operate.

| **Annual Results (tons)** | **NOx** |
|---|---|
| Electric School Bus Emissions | 0.020 - 0.022 |

*Calculations*[6]

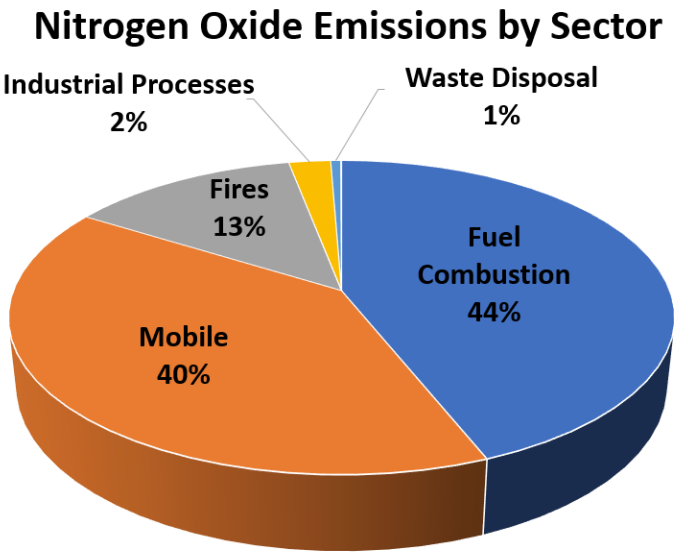
$$Tons\ NOx/vehice/yr\ = \frac{\left(\frac{VMT}{range}\right) * kWh\ full\ charge}{1000} * \left(\frac{3.6\ lbs\ NOx}{MWh}\right) * \left(\frac{453.6\ g}{lb}\right) * \left(\frac{ton}{907{,}200g}\right)$$

*School Bus Fleet*

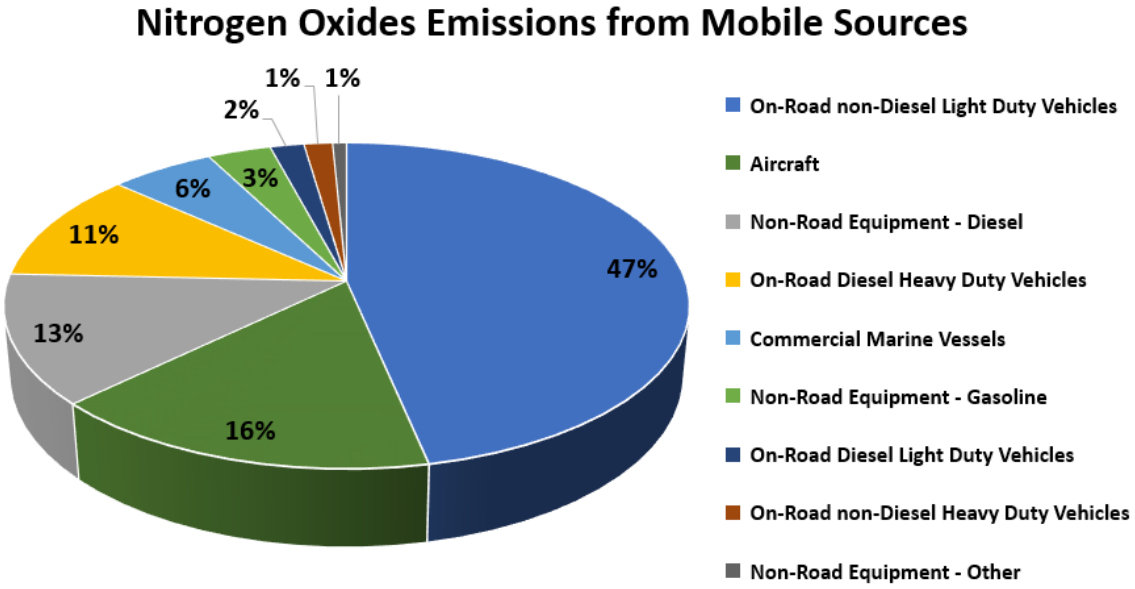
| | Eligible Buses |
|---|---|
| Oahu | 113 |
| Hawaii | 83 |
| Molokai | 15 |
| Maui | 122 |

[5] Assumptions based on total VMT, total fuel consumption, and average age of school bus fleet provided by DOE.
[6] Range of NOx emissions calculated using Lion, Daimler, and Blue Bird EV School Bus specifications.

**Emissions in Hawaii**[7]




**Stationary Nitrogen Oxide Emissions Sources by Zip Code**[8]




[7] 2014 National Emissions Inventory, US EPA (https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data)
[8] 2014 National Emissions Inventory, US EPA (https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data

## EIA Hawaii Electricity Profile [9]

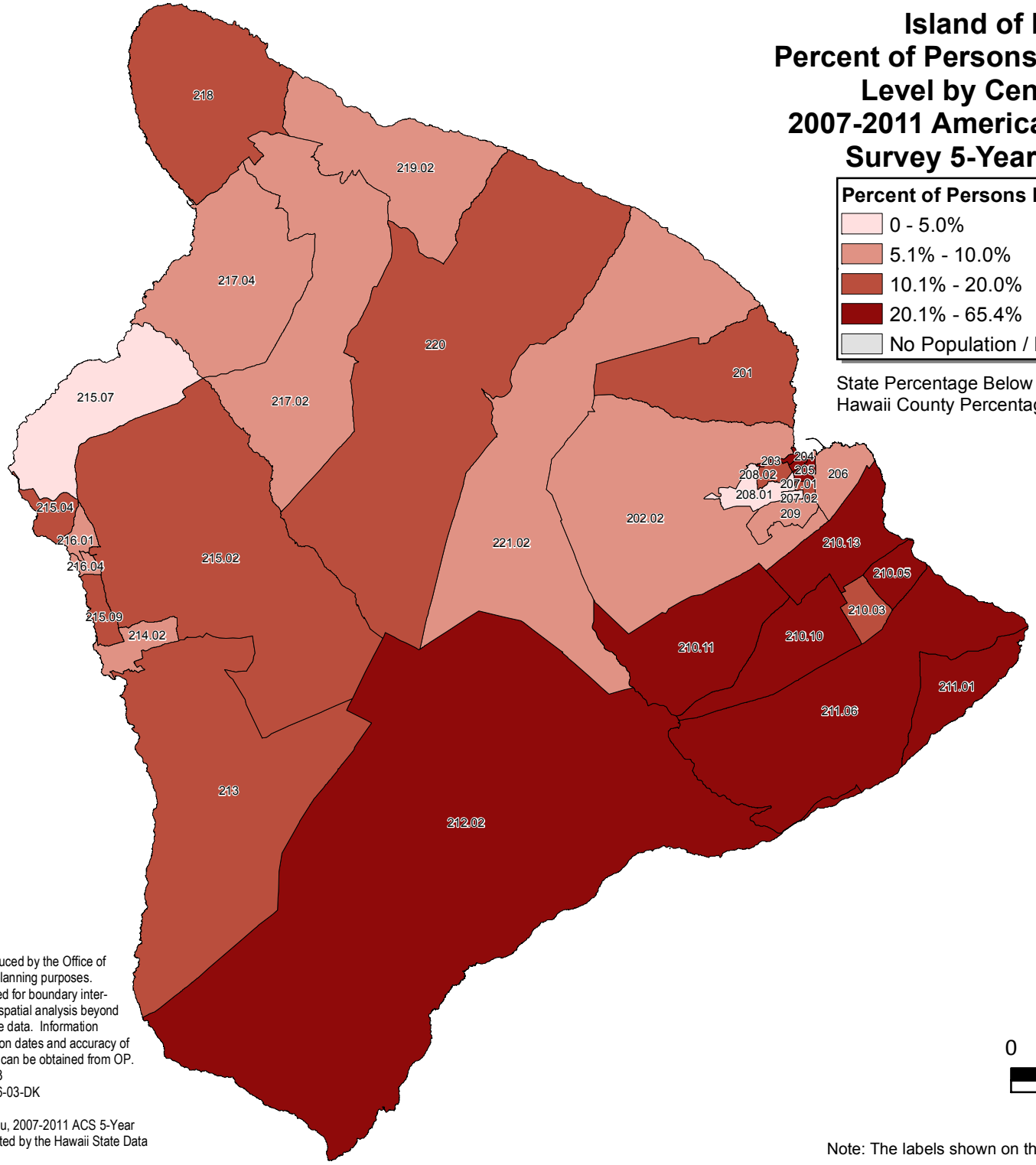
Table 1. 2016 Summary statistics (Hawaii)

| Item | Value | Rank |
|---|---|---|
| **Primary energy source** | | **Petroleum** |
| **Net summer capacity (megawatts)** | **2,645** | **48** |
| Electric utilities | 1,737 | 40 |
| IPP & CHP | 908 | 45 |
| **Net generation (megawatthours)** | **9,948,845** | **46** |
| Electric utilities | 5,218,132 | 39 |
| IPP & CHP | 4,730,713 | 40 |
| **Emissions** | | |
| Sulfur dioxide (short tons) | 19,602 | 29 |
| Nitrogen oxide (short tons) | 17,955 | 33 |
| Carbon dioxide (thousand metric tons) | 7,257 | 42 |
| Sulfur dioxide (lbs/MWh) | 3.9 | 1 |
| Nitrogen oxide (lbs/MWh) | 3.6 | 3 |
| Carbon dioxide (lbs/MWh) | 1,605 | 8 |
| **Total retail sales (megawatthours)** | **9,445,389** | **48** |
| Full service provider sales | 9,445,389 | 44 |
| Energy-only provider sales | | |
| **Direct use (megawatthours)** | **733,841** | **32** |
| **Average retail price (cents/kWh)** | **23.87** | **1** |

[9] Hawaii Electricity Profile 2016, EIA (https://www.eia.gov/electricity/state/hawaii/). Nitrogen Oxide emissions are 3.6 lbs/MWh.

## 7.3 Percent of Persons Below Poverty Level by Census Tract

# Island of Hawaii
# Percent of Persons Below Poverty Level by Census Tract
# 2007-2011 American Community Survey 5-Year Estimates




**Percent of Persons Below Poverty Level**

- 0 - 5.0%
- 5.1% - 10.0%
- 10.1% - 20.0%
- 20.1% - 65.4%
- No Population / No Data Available

State Percentage Below Poverty Level: 10.2%
Hawaii County Percentage Below Poverty Level: 15.8%

HAWAII STATEWIDE GIS PROGRAM
HAWAII STATE OFFICE OF PLANNING

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Map Date: 01/16/13
Map No.: 20130116-03-DK
Source:
U.S. Census Bureau, 2007-2011 ACS 5-Year Estimates; extracted by the Hawaii State Data Center, DBEDT.

N

0 5 10 20
Miles

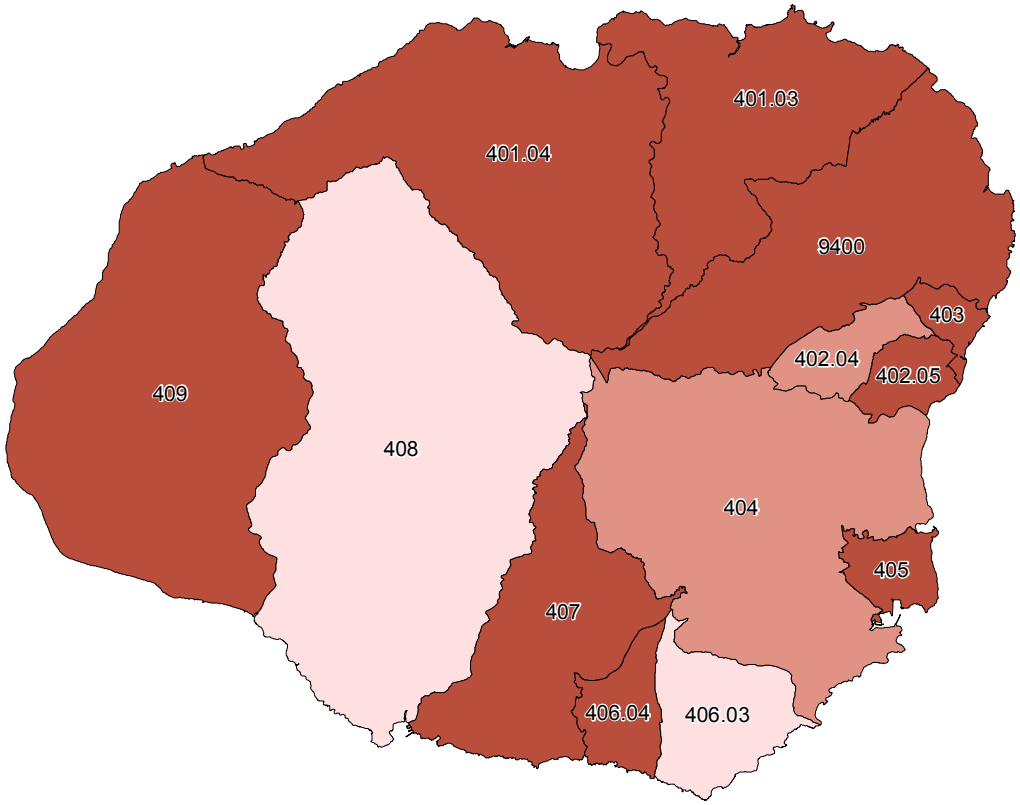
Note: The labels shown on the map are census tract numbers.

# Islands of Kauai and Niihau
# Percent of Persons Below Poverty Level by Census Tract
# 2007-2011 American Community Survey 5-Year Estimates

**Percent of Persons Below Poverty Level**

- 0 - 5.0%
- 5.1% - 10.0%
- 10.1% - 20.0%
- 20.1% - 65.4%
- No Population / No Data Available

State Percentage Below Poverty Level: 10.2%
Kauai County Percentage Below Poverty Level: 10.0%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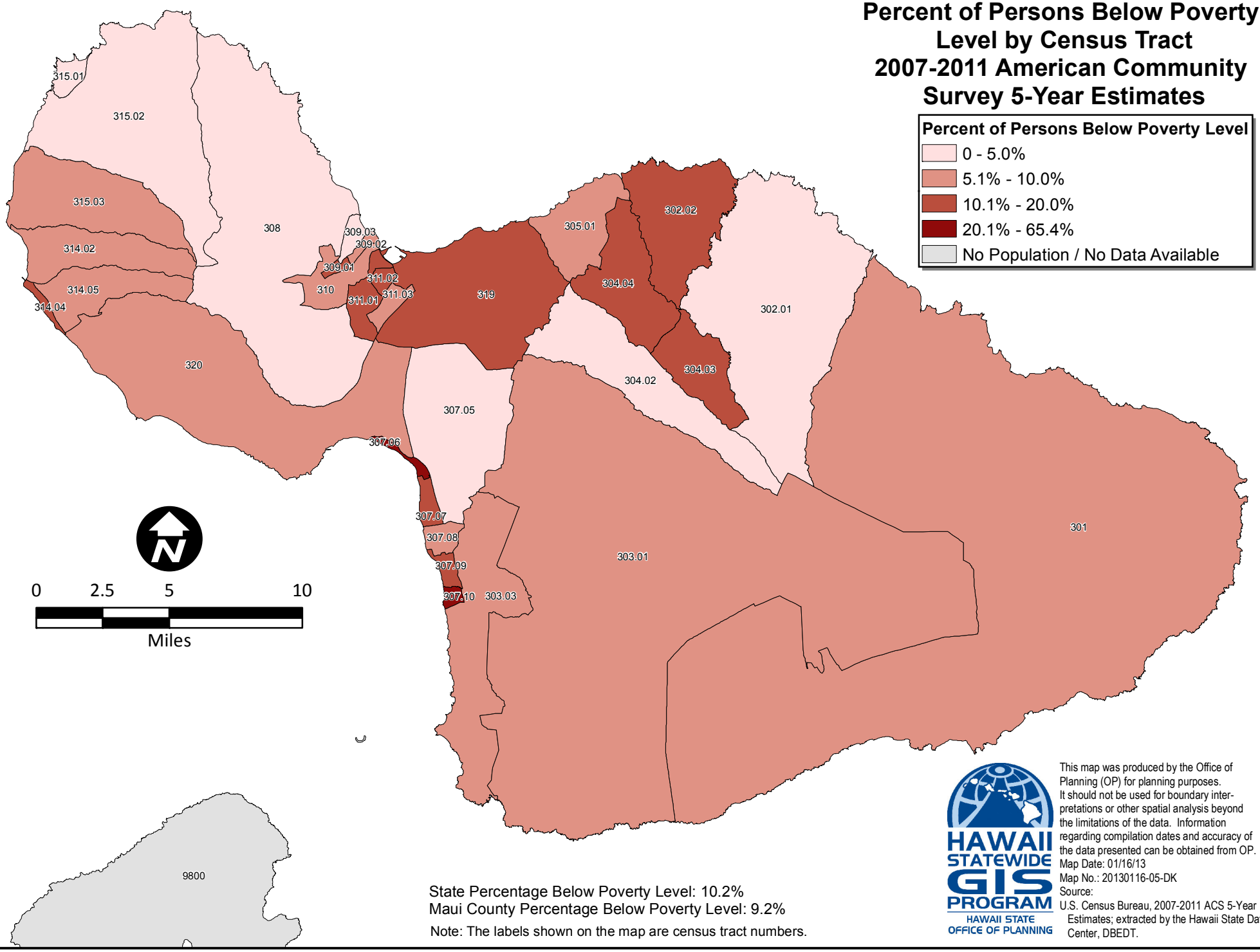
Map No.: 20130116-04-DK
Source:
U.S. Census Bureau, 2007-2011 ACS 5-Year Estimates; extracted by the Hawaii State Data Center, DBEDT.

Note: The labels shown on the map are census tract numbers.

N

0 2.5 5 10
Miles

# Island of Maui
# Percent of Persons Below Poverty Level by Census Tract
# 2007-2011 American Community Survey 5-Year Estimates




State Percentage Below Poverty Level: 10.2%
Maui County Percentage Below Poverty Level: 9.2%

Note: The labels shown on the map are census tract numbers.

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HAWAII STATE OFFICE OF PLANNING

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Source:
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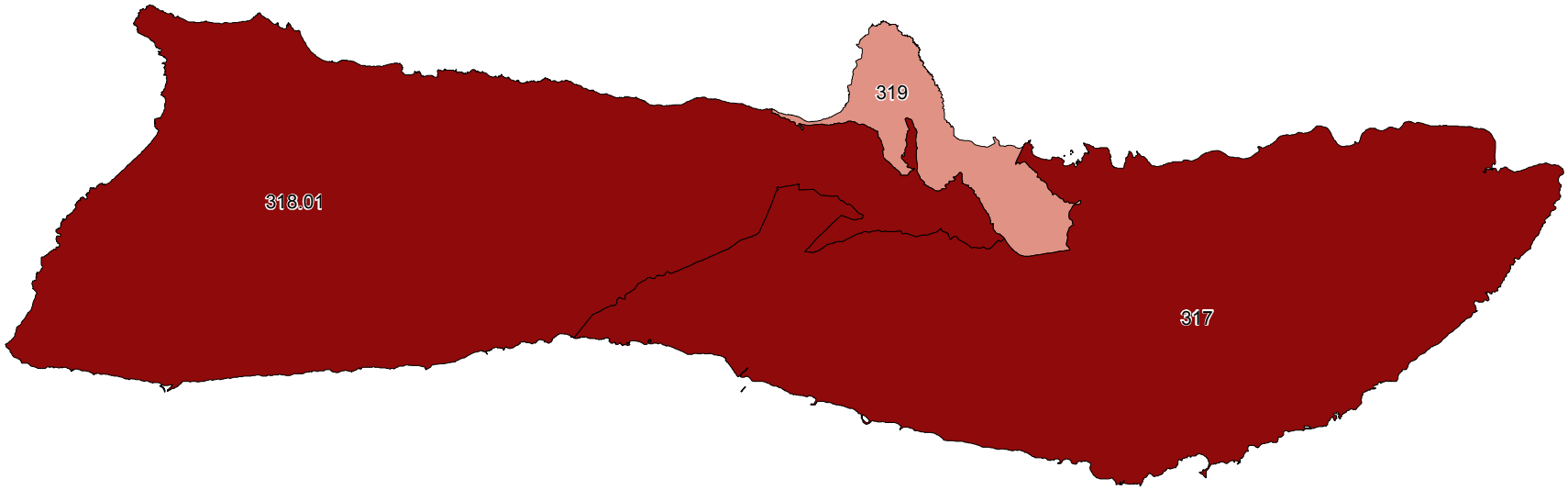



# Islands of Molokai and Lanai
# Percent of Persons Below Poverty Level by Census Tract
# 2007-2011 American Community Survey 5-Year Estimates

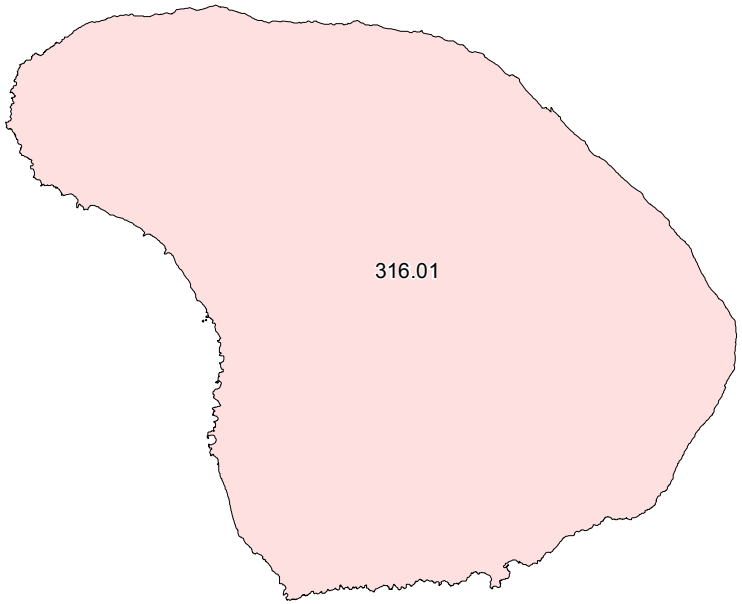
**Percent of Persons Below Poverty Level**

- 0 - 5.0%
- 5.1% - 10.0%
- 10.1% - 20.0%
- 20.1% - 65.4%
- No Population / No Data Available

State Percentage Below Poverty Level: 10.2%
Maui County Percentage Below Poverty Level: 9.2%
Note: The labels shown on the map are census tract numbers.

N

0 2.5 5 10
Miles

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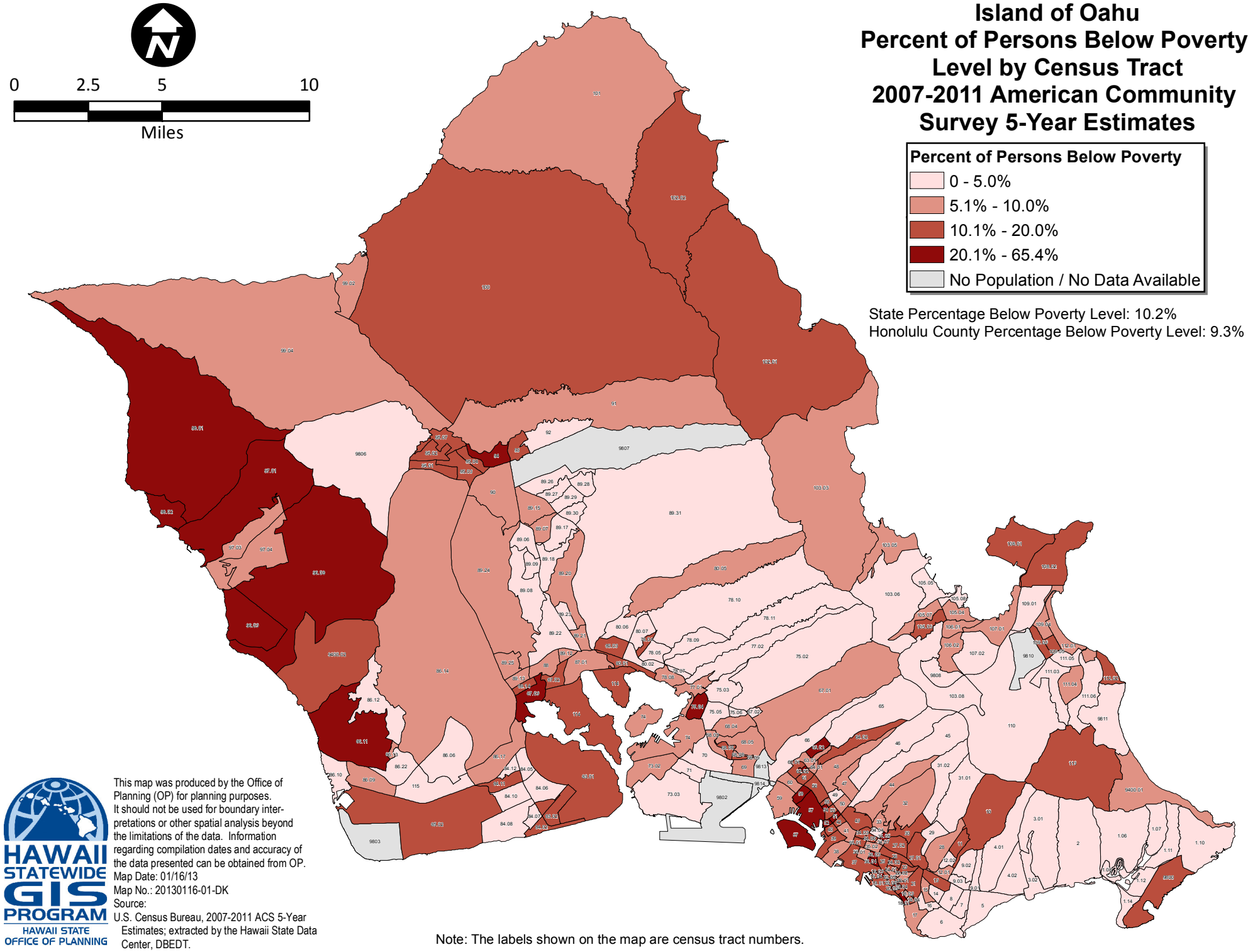
0
2.5
5
10
Miles
Island of Oahu
Percent of Persons Below Poverty Level by Census Tract
2007-2011 American Community Survey 5-Year Estimates
Percent of Persons Below Poverty
0 - 5.0%
5.1% - 10.0%
10.1% - 20.0%
20.1% - 65.4%
No Population / No Data Available
State Percentage Below Poverty Level: 10.2%
Honolulu County Percentage Below Poverty Level: 9.3%
HAWAII STATEWIDE GIS PROGRAM
HAWAII STATE OFFICE OF PLANNING
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Map Date: 01/16/13
Map No.: 20130116-01-DK
Source:
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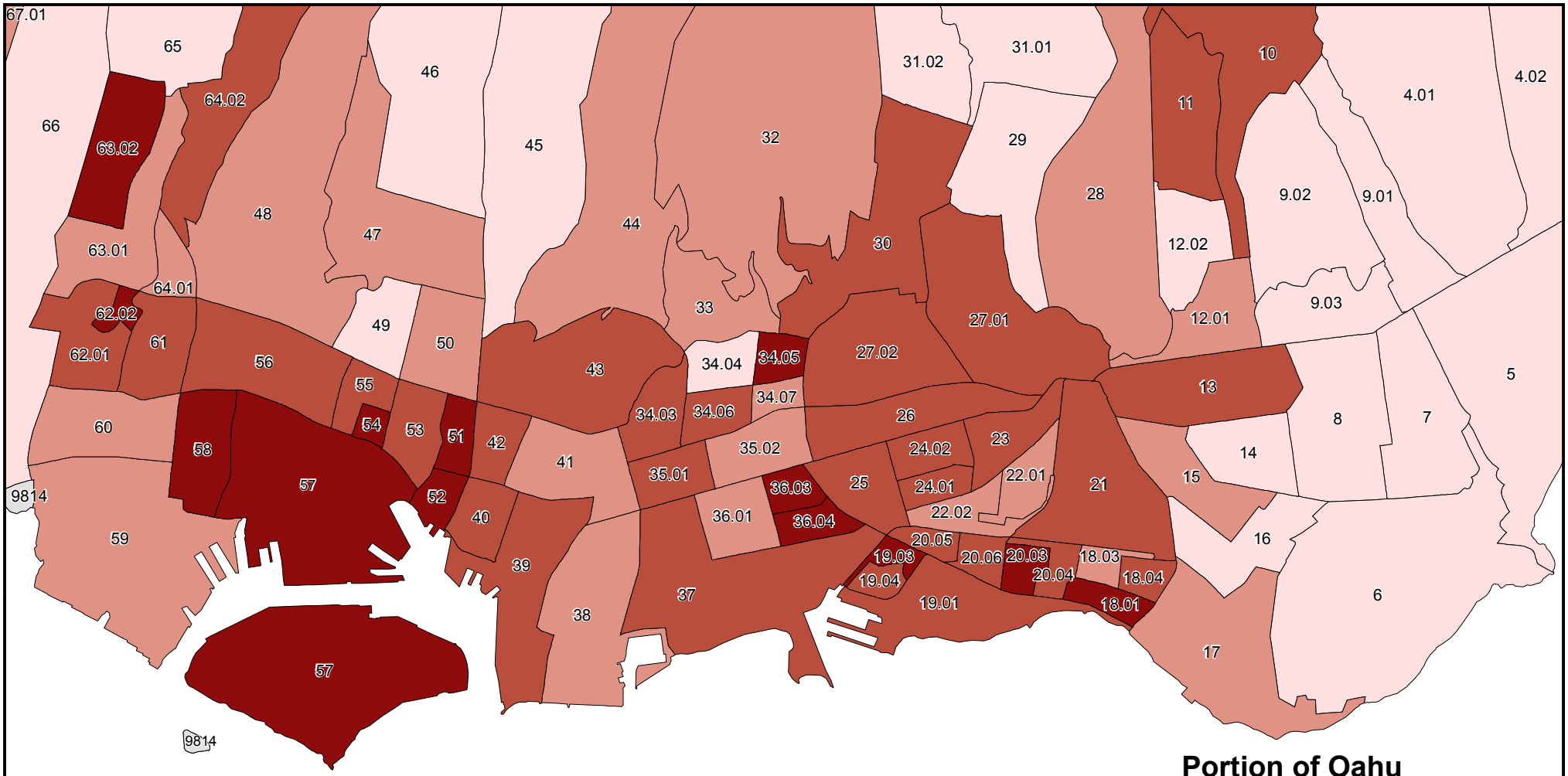
Note: The labels shown on the map are census tract numbers.

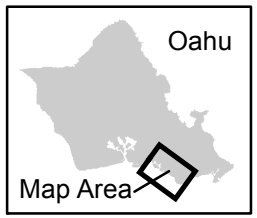



# Portion of Oahu
# Percent of Persons Below Poverty Level by Census Tract
# 2007-2011 American Community Survey 5-Year Estimates

**Percent of Persons Below Poverty Level**

- 0 - 5.0%
- 5.1% - 10.0%
- 10.1% - 20.0%
- 20.1% - 65.4%
- No Population / No Data Available

State Percentage Below Poverty Level: 10.2%
Honolulu County Percentage Below Poverty Level: 9.3%
Note: The labels shown on the map are census tract numbers.




0 0.5 1 2
Miles

HAWAII STATEWIDE GIS PROGRAM
HAWAII STATE OFFICE OF PLANNING

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Map Date: 01/16/13
Map No.: 20130116-02-DK
Source:
U.S. Census Bureau, 2007-2011 ACS 5-Year Estimates; extracted by the Hawaii State Data Center, DBEDT.

## 7.4 Paragraph 7. Publicly Available Information

Attachment to
CERTIFICATION FOR BENEFICIARY STATUS UNDER ENVIRONMENTAL MITIGATION TRUST AGREEMENT

**Paragraph 7. Publicly Available Information**

**STATE OF HAWAII**

The Department of Business, Economic Development, and Tourism (DBEDT) has been designated as the Lead Agency for purposes of the State of Hawaii's participation as a Beneficiary of the Volkswagen (VW) Environmental Mitigation Trust (Trust). In accordance with Hawaii's CERTIFICATION FOR BENEFICIARY STATUS UNDER ENVIRONMENTAL MITIGATION TRUST AGREEMENT, Paragraph 7, Publicly Available Information, DBEDT will maintain and make publicly available all documentation and records: (i) submitted by DBEDT in support of each funding request (Eligible Mitigation Action); and, (ii) supporting all expenditures of Trust Funds until the Consent Decree Termination Date, unless the laws of the Beneficiary require a longer retention period. The purpose of the public outreach component of the Trust is to promote transparency and offer opportunity for community engagement so that interested stakeholders and communities, including those with any environmental justice concerns, can provide input on the eligible mitigation projects that best serve the needs of the respective communities and the State of Hawaii.

**The following explains how the State of Hawaii will comply with Paragraphs 7(i), (ii), and (iii):**

Paragraph 7(i) – The procedures by which the records may be accessed, which shall be designed to support access and limit burden for the general public.

DBEDT will maintain all required Trust records in accordance with all applicable laws and procedures. In order to provide easy access and limit the burden to the general public and other interested stakeholders, DBEDT will create and maintain a public website for the duration of the Trust exclusively for its Trust activities: energy.hawaii.gov, under the Testbeds & Initiatives – Hawaii VW Environmental Mitigation Trust webpage. This website will provide all documentation and records required to be made publicly available by the Trust, including but not limited to:

- Records submitted by the State of Hawaii in support of each funding request
- Records supporting all expenditures of the Trust Funds by the State of Hawaii
- Any other records and documentation required by the Trustee to be made publicly available

DBEDT also intends to provide through its website additional documents and records related to the Trust, including but not limited to the following documents:

- Relevant background documentation (Consent Decree, Court filings, etc.)
- Reports required to be submitted to the Trustee
- Beneficiary Mitigation Plan

Paragraph 7(ii) – The procedures by which public input will be solicited and considered for the Hawaii Beneficiary Mitigation Plan.

Since the public announcement of the Trust settlement, DBEDT has been coordinating with public and private stakeholders, and receiving input for consideration with regard to the development of a Beneficiary Mitigation Plan (Plan). In addition, prior to the filing of its Plan, DBEDT will solicit and

consider public input online via DBEDT's website: energy.hawaii.gov. Public input received will be considered and incorporated as practicable. DBEDT will issue a press release to announce the opportunity for the public to provide input on the Plan. The press release will include instructions and procedures by which public input can be provided online (e.g., online questionnaire or form).

Paragraph 7(iii) – A description of whether and the extent to which the Certification in this Paragraph 7 is subject to the Beneficiary's applicable laws governing the publication of confidential business information and personally identifiable information.

This Certification is not prohibited by State laws, including Chapter 92F, Hawaii Revised Statutes (Uniform Information Practices Act, Modified), which governs public accessibility to government documents: http://www.capitol.hawaii.gov/hrscurrent/Vol02_Ch0046-0115/HRS0092F/HRS_0092F-.htm