



HAWAII STATE
Energy Office

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energy.hawaii.gov

**ENERGY RESOURCES COORDINATOR'S REPORT
ON THE STATUS AND PROGRESS OF
CLEAN ENERGY INITIATIVES AND THE
ENERGY SECURITY SPECIAL FUND**

Prepared by the
Hawaii State Energy Office
Department of Business, Economic Development & Tourism

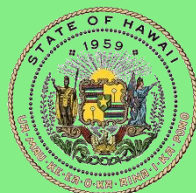


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This report fulfills the reporting requirements for:

- HRS 196-4(11)
- HRS 196-10.5
- HRS 196-41
- HRS 201-12.5
- HRS 201-12.8
- HRS 235-110.31(k)

This annual report required by each of these statutes have been combined into this single, comprehensive report.

Energy Resources Coordinator's Statement

Hawaii is making strides in its pursuit of clean and renewable energy. As we continue to generate a larger and larger share of our electricity from renewable resources finding suitable sites for new clean energy given Hawaii's land constraints will become increasingly challenging. It also will be vital to find the right mix of renewable energy resources and correctly phase investments to ensure that the clean energy transformation is carried out in the most cost-effective way. And this all must all be done while working to make sure we use energy more efficiently in order to minimize the amount of new generation needed.

These are some of the challenges being addressed by the Department of Business, Economic Development, and Tourism (DBEDT) as it fulfills in its statutory duties as the state's Energy Resources Coordinator (ERC). This edition of the annual ERC Report highlights the work done by DBEDT and the Hawaii State Energy Office over the past year to meet those challenges as we continue down the path toward 100 percent renewable energy.

We are pleased to report progress on a host of innovative projects and initiatives, including new tools that make it easier for landowners, developers, residents, and policymakers to assess potential renewable sites statewide. We also completed a study at the request of the Legislature that will provide guidance on which utility ownership and regulatory models could best serve Hawaii.

Hawaii's clean energy movement is fortunate to have the support of a broad coalition of energy stakeholders with a common goal. Operating under the framework of the Hawaii Clean Energy Initiative, a partnership of diverse groups from government, the private sector and nonprofits have been forged that will focus on Hawaii's clean energy future.

We need to continue working together with a commitment to our common objectives. If we can accomplish that, nothing can stop us from building a stronger, more sustainable Hawaii in a new carbon-free world.



State of Hawaii Strategic Energy Goals

Advancing Hawaii’s Clean Energy Goals

Hawaii is the most oil dependent state in the nation spending nearly \$2 billion a year on imported foreign oil. A vision for a clean energy future is not enough to make it happen – it must be paired with a resolute push for policies that promote progress and eliminate obstacles.

- **Energy Efficiency Portfolio Standards (HRS 269-96):** 4,300-gigawatt-hours reduction in electricity use by 2030.
- **Renewable Portfolio Standards (HRS 269-92):** 100% renewable energy in the electricity sector by 2045.

Hawaii State Energy Office Strategic Goals

GOAL 1:

Promote Energy Efficiency

Reduce waste, reduce pollution, save money.

GOAL 2:

Diversify our Energy Portfolio

Hawaii is blessed with abundant renewable energy resources that can power our electricity and our economy.

GOAL 3:

Establish a Grid for the 21st Century

Hawaii’s grid for the 21st century must provide opportunities for customers as well as utilities to efficiently meet energy needs and to maximize the benefits of renewable energy resources.

GOAL 4:

Accelerate Clean Transportation

Hawaii’s transportation transformation involves near-term focus on ground transportation and a long-term perspective on diversifying fuels in aviation and marine transportation.

Collaboration with Stakeholders

Achieving Hawaii’s energy goals requires collaboration with stakeholders. All stakeholders have their roles and responsibilities, and it is only with collaboration and commitment that Hawaii will achieve its goals.



GOAL 1: HSEO Support of Energy Efficiency

Energy Performance Contracting (EPC)

HSEO provides technical assistance to state and county agencies entering into energy performance contracts and projects that include office buildings, community colleges, airports, highways, and prisons.

National leader: (1) Seventh consecutive *Race to the Top* award.

(2) One of seven states in the nation to surpass the half-billion-dollar mark for investment in EPC in 2017.

(3) Investment of \$507.1 million for EPC since 1996 saves estimated \$1.2 billion in electricity costs over the life of the contracts.

- Includes 295 buildings and facilities covering more than 112 million square feet.

- Savings from EPC are equivalent to powering 388,210 homes for one year.

Hawaii Green Business Program (HGBP)

HGBP recruits, provides technical assistance, and recognizes businesses to operate in an environmentally and socially responsible manner.

Partnership of Hawaii's Department of Business, Economic Development, and Tourism; Department of Health; the Board of Water Supply; and the Chamber of Commerce of Hawaii.

Participating businesses' overall savings:

- 22.7 million kWh of energy (equivalent to powering 3,531 Hawaii homes for one year).
- 203.2 million gallons of water.
- \$6.4 million in energy costs.

Hawaii Energy Building Code

HSEO was instrumental in updating the 2015 International Energy Conservation Code. When adopted, the code will provide:

- 30-33% increased efficiency for commercial buildings.
 - 9-10% increased efficiency for residential.
 - \$1.4 billion in savings over the next 20 years.
- Conducted 12 statewide code training sessions and completed a code compliance assessment.

GOAL 2: HSEO Support of Renewable Energy

Hawaii Solar Brightfields Initiative

Contaminated and underutilized sites hold the potential as an alternative for renewable energy development. HSEO is updating the following online resources:

1. **Renewable EnerGIS** on individual sites throughout Hawaii to determine a site's renewable energy development potential. EnerGIS provides site-specific data on:
 - Renewable energy resource potential such as solar, wind, biomass, hydropower, geothermal, and marine.
 - Siting potential such as slope, acres, prime agricultural land, presence of sensitive environments, and flood zone.
 - Applicable regulations and potential permits including state/county zoning, special management area, soil type, and critical habitat.

Analytics from Jan. 8 – Aug. 14, 2018: 709 Users, 1,935 Sessions, 2,296 Pageviews

HSEO plans to upgrade EnerGIS by adding new site contamination and remediation data to develop a renewable energy project at a given site.

2. **Renewable Energy Permitting Wizard** to identify all federal, state, and county permits possibly required for a given renewable energy project at a known location selected by the user. At the end of each evaluation the Wizard produces a 'Permit Plan' showing the potential permits required, estimated timing for each permit, recommended sequencing, and information on each permit and agency.

Analytics from Jan. 1 – Aug. 14, 2018: 183 Users, 274 Sessions, 1,877 Pageviews.

HSEO plans to upgrade the Wizard to reduce processing times, modernize its appearance, update its existing content (questions, answers, permits), and add new information on the permits and approvals required for sites with known or perceived contamination.

Renewable Fuels Production Tax Credit

HSEO conducted verification and certification for the 2018 Renewable Fuels Production Tax Credit. In subsequent years, verification and certification will be done by an independent 3rd party.



GOAL 3: HSEO Support of a 21st Century Grid

Utility Business Model Analysis

- Act 124 (SLH 2016) directs evaluating the costs and benefits of various electric utility ownership models, as well as the viability of various utility regulatory approaches.
- Hosted at least two statewide community meetings. Final report to provide an assessment on utility business and regulatory models.
- Contract completion date is January 2019.

Energy Planning Quantitative and Qualitative Capacity

Developing analytical tools to assist planning and policies for topics such as electric production and delivery, electrification of ground transportation, energy efficiency, customer adoption of distributed energy resources, land use, and energy resiliency. Tools include:

Hawaii Advanced Visualization Environment Nexus (HAVEN) for visualization and analysis of energy system data.

- Format allows users to analyze and understand complex energy data sets and more easily communicate this data and its meaning to stakeholders.
- 1st visualization was completed at the end of 2017.
- Visualization #1 was developed to view the electric system and land use impacts of the Hawaiian Electric Companies' Power Supply Improvement Plan from the present through 2045.
- 2nd visualization is scheduled to be completed by the end of 2018 to incorporate GIS layers such as sea level rise.

Hawaii Energy Visualization Initiative (HEVI) is an analytical model for scenario analysis on Hawaii's comprehensive energy system as well as feed data visualizations for program and policy assessment.

- Beta version of the HEVI model is complete.
- Continue working closely with the National Renewable Energy Laboratory to develop additional modules and functionality.

GOAL 4: HSEO Support of Clean Transportation

State Fleet Electrification Feasibility Analysis

- Analyzing the requirements and steps needed to transition the state's light-duty fleet to electric vehicles.
- Focusing on one state agency.

Volkswagen Settlement

- DBEDT is the lead agency to administer the Volkswagen Settlement's Environmental Mitigation Trustee (Trustee) of \$8.125 million.
- Funds are to be expended over 10 years and overseen by the Trustee.
- HSEO requested public input for the development of the Hawaii's Beneficiary Mitigation Plan in February 2018.
- HSEO anticipates submitting Hawaii's Beneficiary Mitigation Plan to the Trustee by 2018.

In addition to the Trust, Volkswagen must invest \$2 billion over the next 10 years in zero-emission vehicle infrastructure across the United States through its Electrify America initiative. HSEO submitted comments for Electrify America to evaluate opportunities for state fleet electrification in support of the investment of electric vehicle charging infrastructure across Hawaii.

U.S. Department of Transportation Federal Highway Administration (FHWA) designation of Electric Drive Corridors across Oahu and Maui

The FHWA designated two additional State of Hawaii highways as alternative fuel corridors, allowing for signage noting electric vehicle chargers or hydrogen fuel stations. The two corridors are in addition to seven other alternate fuel corridors on Maui and Oahu approved by the FHWA in 2016. The nomination of two Hawaii Island corridors were coordinated by HSEO in cooperation with the Hawaii Department of Transportation, Hawaii Center for Advanced Transportation Technologies, Hawaii Natural Energy Institute, County of Hawaii, the Hawaiian Electric Companies, and EV charging network provider, Greenlots.

Introduction and Overview

State of Hawaii – Legislative Directives

The Legislature recognized and directed energy planning and policies to ensure a clean energy future. There are three major legislative directives that guide the functions of the Energy Resources Coordinator (ERC):

- **HRS 196-1** (Energy Resources; findings and declaration of necessity).
- **HRS 201-12.8** (Department of Business, Economic Development, and Tourism; Energy Security Special Fund; uses).
- **HRS 226-18** (Hawaii State Planning Act; Objectives and policies for facility systems—energy).

I. **HRS 196-1 (Energy Resources; findings and declaration of necessity).**

In the following excerpts from HRS 196-1, the Legislature articulated a clear understanding and direction to the ERC.

- a. HRS 196-1(2) There is a real need for comprehensive strategic planning in the effort towards achieving full use of Hawaii's energy resources and the most effective allocation of energy resources throughout the state. Both short-range and long-range planning will permit the articulation of:
 - i. Broad policies, goals, and objectives;
 - ii. Criteria for measuring and evaluating accomplishments of objectives;
 - iii. Identification and implementation of programs that will carry out such objectives; and
 - iv. A determination of requirements necessary for the optimum development of Hawaii's energy resources.

Such planning efforts will identify present conditions and potential issues relating to energy resources, their exploration, development, production, and distribution. It will show the nature of the present condition and the rate of change, into the foreseeable future based on a projection of current trends.

- b. HRS 196-1(3) The State requires an in-depth understanding of the causes and effects of any transitional issues and trends related to changes in the State's energy resources, systems, and markets.
- c. HRS 196-1(5) There is an ongoing need in this State to coordinate the efforts of statewide industry and government energy interests; maintain the technical capability and adequate capacity to quantitatively and qualitatively evaluate, analyze, develop, and coordinate implementation of private and public sector energy planning efforts; recommend market-based policies to develop Hawaii's energy resources, systems, and markets; establish and coordinate programs to preserve and protect the State's energy security, maintain a robust energy emergency preparedness program, and effectuate the conservation of energy resources to provide for the equitable distribution thereof; and to formulate plans for the development and use of alternative energy sources.

II. **HRS 201-12.8 (Department of Business, Economic Development, and Tourism; Energy Security Special Fund; uses)**

Through HRS 201-12.8 the Legislature further entrusted funding to support planning to ensure a clean energy future. The Legislature's full awareness of Hawaii's high dependence on, and consequent vulnerability to,

imported fossil fuels engendered legislative directives to look to Hawaii's abundant natural energy resources to secure resilient, reliable, environmentally responsible, and economic beneficial solutions.

III. HRS 226-18 (Hawaii State Planning Act; Objectives and policies for facility systems – energy). These concerns and directives also are reflected under HRS 226-18 which calls for “due consideration” to the following:

- a. Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;
- b. 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;
- c. Greater diversification of energy generation in the face of threats to Hawaii's energy supplies and systems;
- d. Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use; and
- e. Utility models that make the social and financial interests of Hawaii's utility customers a priority.

Hawaii Clean Energy Initiative (HCEI) HRS 196-10.5 provides further direction on the delegated duties of the ERC to the Hawaii State Energy Office (HSEO)

(a) There is established within the Department of Business, Economic Development, and Tourism, a Hawaii Clean Energy Initiative program to manage the State's transition to a clean energy economy. The clean energy program shall design, implement, and administer activities that include:

1. Strategic partnerships for the research, development, testing, deployment, and permitting of clean and renewable technologies;
2. Engineering and economic evaluations of Hawaii's potential for near-term project opportunities for the State's renewable energy resources;
3. Electric grid reliability and security projects that will enable the integration of a substantial increase of electricity from renewable-energy resources;
4. A statewide clean energy public education and outreach plan to be developed in coordination with Hawaii's institutions of public education;
5. Promotion of Hawaii's clean and renewable resources to potential partners and investors;
6. A plan, to be implemented from 2011 to 2030, to transition the State to a clean energy economy; and
7. A plan, to be implemented from 2011 to 2030, to assist each county in transitioning to a clean energy economy.

(b) Prior to the initiation of any activities authorized under subsection (a), the Department of Business, Economic Development, and Tourism shall develop a plan of action with the intent of promoting effective prioritization and focusing of efforts consistent with the State's energy programs and objectives.

(c) The Department of Business, Economic Development, and Tourism shall submit a report to the Legislature no later than twenty days prior to the convening of each regular session on the status and progress of new and existing clean energy initiatives. The report also shall include:

- i. The spending plan of the Hawaii clean energy initiative program;
- ii. All expenditures of energy security special fund moneys; and
- iii. The targeted markets of the expenditures, including reasons for selecting those markets, the persons to be served, specific objectives of the program, and program expenditures, including measurable outcomes. [L 2010, c 73, §8]

Executive Summary

Hawaii's clean energy transformation gained momentum over the past year, benefiting from continued growth in renewable energy installations, energy efficiency improvements, advances in energy planning and direction from the Legislature authorizing the creation of programs to reduce carbon emissions via several channels. Hawaii also stepped up efforts to reduce use of petroleum in the transportation sector, aided in part by more than \$8 million allotted to state government in a nationwide settlement with Volkswagen stemming from the car company's 2015 admission that it equipped some of its vehicles with software to circumvent emissions tests.

The Energy Resources Coordinator (ERC), the director of the Department of Business, Economic Development, and Tourism (DBEDT) is responsible for planning, managing and monitoring Hawaii's energy program as mandated by HRS 196. These responsibilities have been delegated to the Hawaii State Energy Office (HSEO) as it works to implement the state's clean energy vision. HSEO is supported in its efforts by a bold policy agenda made possible through the cooperation of a coalition of energy stakeholders under the umbrella of the landmark 2008 Hawaii Clean Energy Initiative.

Hawaii is committed to building an energy system that is clean, diversified and resilient. The innovation needed to make this transformation possible has attracted growth companies who are coming to Hawaii to identify and advance next-generation practices for sustainable energy solutions. This report provides an update on the status of various HSEO-supported programs addressing these issues and facilitating Hawaii's clean energy transformation.

Energy Efficiency

HSEO supports an array of energy efficiency programs that are helping the state meet its energy efficiency portfolio standard (EEPS). The EEPS mandates a 4,300-gigawatt-hour reduction in electricity use by 2030 through efficiency and conservation measures. Hawaii surpassed its 2015 interim EEPS target thanks in part to the robust issuance of energy performance contracts (EPC). With technical assistance from HSEO staff and contractors, Hawaii led the nation in 2018 for the seventh consecutive year in the per capita value of energy savings performance contracts awarded by state and local governments. HSEO also is working with Hawaii's counties to have their councils adopt a new International Energy Conservation Code for new construction that will reduce energy use in buildings by nearly one-third. HSEO was a key player in the Hawaii Building Code Council's adoption of the updated code, which will significantly advance Hawaii's clean energy goals.

Renewable Energy

The share of utility electricity sales from renewable sources, also known as the renewable portfolio standard (RPS), rose to 27.6 percent at the end of 2017, representing a three-fold increase in the RPS from the end of 2010. With an abundance of new renewable energy projects in the pipeline, Hawaii is on track to reach its interim RPS target of 30 percent by 2020. HSEO, through its online Developer & Investor Center and Self-Help Suite, assists renewable energy companies developing renewable energy projects that will help the state achieve its renewable energy targets. Finding suitable sites for renewable energy projects is a challenge for developers. Toward this end HSEO is developing a program that will identify underutilized contaminated sites in Hawaii that could be used for development of large-scale PV projects.

Energy Planning

Thoughtful energy planning is becoming more and more important as Hawaii moves toward an increasingly complex energy system with more renewable resources, flexible power generation and synergies with alternative transportation fueling systems. Energy planning by HSEO takes a holistic perspective to achieve the direction of the Hawaii Clean Energy Initiative in managing the state's transition to a clean energy economy. To assist in this effort HSEO is developing two innovative visualization planning tools: the Hawaii Advanced Visualization Environment Nexus (HAVEN) and the Hawaii Energy Visualization Initiative (HEVI). HAVEN allows stakeholders to visualize the electric system and land use impacts of the HECO Companies' Power Supply Improvement Plan from the present through 2045. HEVI is an analytical model that will perform scenario analyses on Hawaii's comprehensive energy eco-system as well as feed data visualizations for program and policy assessment. HSEO also has undertaken a study at the request of the Legislature that will provide guidance on which utility ownership and regulatory models could best serve Hawaii as it makes the transition to an electricity system that takes full advantage of the state's plentiful clean, indigenous energy resources.

Clean Transportation

Hawaii's efforts to date in reducing its dependence on fossil fuel have focused largely on power generation. However, with transportation accounting for 60 percent of Hawaii's oil consumption, there is a growing recognition that a stronger push is needed to clean up the transportation sector. HSEO has taken a leadership role in that regard, including promoting zero emission vehicles and charging infrastructure that are contributing to reductions of petroleum consumption and emissions. HSEO has submitted a draft plan to spend \$8.125 million under the Volkswagen Settlement's Environmental Mitigation Trust to promote the reduction of vehicle emissions in Hawaii. HSEO also worked with the Federal Highway Administration to have nine Hawaii highways designated as "alternative fuel corridors," clearing the way for the installation of signage that will alert drivers to locations with electric vehicle chargers or hydrogen fueling stations.

Education and Outreach

HSEO's public education and outreach efforts are driven by the need to increase awareness surrounding the Energy Office's key platforms that help the state achieve its clean energy goals. Target audiences are engaged through traditional and modern media vehicles as well as coordinated community outreach efforts. The goal is to provide clear and compelling information to energy stakeholders, while building HSEO's brand in a way that helps keep it a relevant player in Hawaii's clean energy transformation. Among HSEO's vehicles for education and outreach are its participation in the Drive Electric Hawaii coalition focused on eliminating fossil fuel use in ground transportation, maintenance of the HSEO and HCEI websites, representation of the State of Hawaii in regulatory proceedings, serving as a liaison with the military on energy issues, coordinating with organizers of conferences such as the Maui Energy Conference, and publishing resources such as Hawaii Energy Facts & Figures. HSEO also issues press releases and posts on social media platforms to raise awareness and communicate progress of its clean energy efforts.

ENERGY EFFICIENCY

Hawaii's state energy policy is geared toward maximizing cost-effective investments and fostering high impact programs. Hawaii has set an overall goal for energy efficiency to reduce electricity consumption by 4,300 gigawatt-hours by 2030. To achieve this goal the Hawaii State Energy Office (HSEO) works with federal, state, and county agencies, energy stakeholders, and the local community to encourage and facilitate energy efficiency and conservation. The program target audience also includes emerging clean energy producers, businesses, and organizations interested in energy efficiency and key energy stakeholders and policymakers.

Conserving Energy Resources

Pursuant to HRS 196-41, HRS 196-4(3), and HRS-196-4(4), the Energy Resources Coordinator (ERC) shall develop programs to maximize cost-effective conservation measures by state government agencies, assist public and private agencies in implementing energy conservation and efficiency programs, and formulate and recommend specific proposals for conserving energy resources.

Energy Performance Contracting

Energy performance contracting (EPC) allows government agencies to pay for energy efficiency, distributed energy resource upgrades, and renewable energy installations with the savings on their utility bills. HSEO provides technical assistance to state and county agencies entering into energy performance contracts and projects that include office buildings, community colleges, airports, highways, and prisons. To support these efforts HSEO developed an *Energy Performance Contracting Guide* for state and county agencies containing model templates and best practices.

Technical assistance HSEO has provided to state and local government facility decision-makers include:

1. Reviewing energy service company proposals;
2. Evaluating investment grade audits;
3. Reviewing contracts and financing packages;
4. Conducting educational/technical training sessions; and
5. Providing ongoing assistance and support services.

HSEO's involvement in state agency EPC has supported the Daniel K. Inouye International Airport (HNL) attain Airport Carbon Accreditation from the Airports Council International – North America for 2016 and 2017. Airport Carbon Accreditation recognizes efforts of airports to manage and reduce their CO2 emissions. Inventories of greenhouse gas emissions of HNL's annual operations have shown that their energy performance contract has allowed the airport to both reduce greenhouse gas emissions and generate clean renewable energy through the installation of solar photovoltaic panels.

As a result of HSEO's efforts to support EPC:

- Hawaii received its seventh consecutive *Race to the Top* award from the Energy Services Coalition in 2018 for being the all-time per capita investment leader in EPC at \$372.81.
- Hawaii also received a second *Race to the Top* award from the Energy Services Coalition in 2018 for having the most EPC investment per capita for 2017.
- Hawaii surpassed the half-billion-dollar mark for investment in EPC in 2017, making it only one of seven states in the nation to achieve this milestone.

- The \$507.1 million of energy performance contracts put in place since 1996 will save the state an estimated \$1.2 billion in electricity costs over the life of the contracts.
- Since 1996 energy performance contracts signed by state and local government agencies include 295 buildings and facilities covering more than 112 million square feet.
- The estimated savings from the energy performance contracts are equivalent to powering 388,210 homes for one year.
- The State Department of Transportation, Airports Division, was recognized for awarding the single largest state contract in the nation for performance contracting. With change orders and the addition of Phase II to the project, the contract has increased to over \$215 million. Over 20 years, the energy saved could power 144,998 homes. Estimated jobs generated/supported each year was 867 for the first two years (construction/installation period); an average of 63 jobs generated/supported each year during the next 18 years of the performance period.

STATE AND COUNTY ENERGY PERFORMANCE CONTRACTS

Agency	Year(s)	Contract Amount (\$)	Estimated Savings Over Life of Contract (\$)
UH-Hilo	1996-2012	\$6,402,695	\$14,630,066
County of Hawaii	1997-2026	\$2,215,546	\$8,157,880
County of Kauai	1998-2012	\$525,965	\$1,205,990
City and County of Honolulu	2001-2025	\$11,900,205	\$36,066,761
Hawaii Health Systems Corporation	2002-2022	\$21,936,997	\$55,766,364
Judiciary	2003-2012	\$1,474,406	\$9,785,036
Department of Accounting and General Services Phase I	2009-2029	\$36,873,266	\$72,580,767
Department of Public Safety	2010-2030	\$25,511,264	\$57,211,112
University of Hawaii Community Colleges	2012-2032	\$34,207,392	\$37,000,000
City and County of Honolulu, Kailua Wastewater Treatment Plant	2013-2033	\$6,054,178	\$13,693,910
Department of Accounting and General Services Phase II	2013-2033	\$17,400,000	\$28,000,000
Department of Transportation (Airports/Highways/Harbors)	2013-2034	\$309,506,592	\$795,560,746
City and County of Honolulu, Board of Water Supply	2016-2036	\$33,125,398	\$56,846,668
Total		\$507,133,904	\$1,186,505,300

Hawaii Green Business Program

The Hawaii Green Business Program (HGBP) recruits, provides technical assistance, and recognizes businesses that strive to operate in an environmentally and socially responsible manner. HGBP is a partnership among the state Department of Business, Economic Development, and Tourism (DBEDT), state Department of Health, the Board of Water Supply, and the Chamber of Commerce of Hawaii. The program recognizes businesses that go beyond

compliance and are dedicated to creating a sustainable Hawaii. From 2009-2017, over 100 business and government entities have benefited from the program, including sectors such as hospitality, commercial office, retail, restaurant, food services, grocery, venue, and green events.

The participating businesses overall savings amounts to:

- 22.7 million kWh of energy (equivalent to powering 3,531 homes for one year in Hawaii)
- 203.2 million gallons of water
- \$6.4 million in energy costs

Hawaii Energy Building Code

Pursuant to HRS 107-22(4), HSEO shall be a voting member and an active participant on the State Building Code Council.

HSEO testified at national hearings on the International Energy Conservation Code (IECC), in support of maximizing energy efficiency. The hearings resulted in adding the tropical climate zone to the national IECC allowing specification of design features unique to warm-weather tropical locales. Buildings built to the tropical code can realize construction cost savings and energy savings up to 48 percent compared to conventional code-compliant buildings. HSEO also chairs the Council and the Council's Investigative committee for the IECC and proposes amendments to the national IECC which ensures additional energy savings. In 2017, HSEO was instrumental in advocating for the adoption of the 2015 IECC Chapter 3-181.1 State Energy Conservation Code Hawaii Administrative Rules which Gov. David Ige signed into law on March 20, 2017. HSEO is working with the counties to have their county councils adopt the 2015 IECC with Hawaii amendments and will testify in support of the 2015 IECC when the county councils hold public hearings on their adoption. The counties were supplied with additional amendment proposals, written by HSEO and approved by the Council, that offer greater energy savings while often reducing construction costs. To facilitate code adoption, HSEO provided statewide training for over 300 public sector code officials and private sector engineers, architects, builders, and vendors, and provided technical assistance by answering code-related questions. HSEO also conducted a study to measure the level of compliance with energy code provisions. A detailed compliance report was issued, including a compliance checklist to assist plan checkers, building designers and builders with a means of ensuring that all applicable code provisions are addressed. Finally, short compliance signature block forms were created to be included on building plans to ensure that all applicable core code requirements were covered.

As a result of HSEO's efforts:

- The estimated net savings from the 2015 IECC with Hawaii amendments is 12,962 MWh in 2016; 1,083,590 MWh in 2026 (year 10); 1,991,059 MWh in 2030; and 4,702,738 MWh in 2036 (year 20).

Solar Water Heater Variances

Pursuant to HRS 196-6.5, effective on January 1, 2010, the ERC shall issue and publicize hot water heater variances, may adopt rules pursuant to chapter 91, and may collect fees to cover the costs of administering variances under this section.

HSEO posts information on solar water heater variances on its website: energy.hawaii.gov/resources/solar-water-heater-variance. Additionally, on August 14, 2018, Gov. Ige approved the adoption of Administrative Rules Title 15, Chapter 37, "Solar Water Heater Variance," to develop an online application to submit solar water heater

variance requests and charge a fee to process variance requests. A public hearing on the administrative rule was conducted on Nov. 1, 2017. Prior notification of the public hearing was publicized Sept. 29, 2017 in the *Honolulu Star-Advertiser*, *Hawaii Tribune-Herald*, *West Hawaii Today*, *The Maui News*, and *The Garden Island*. The hearing was also publicized on the HSEO website and on placards posted in the HSEO office and at the permitting offices of the four counties. After the approved rule was filed with the Office of the Lieutenant Governor, in accordance with HRS §91-4, it was put into effect on Sept. 4, 2018. DBEDT began accepting online submissions of solar water heater variance requests on that day. HSEO also has updated its solar water heater variance website, model, and request form, all of which are available online.

From January 2010 through August 2018, HSEO processed 6,469 solar water heater variance requests. The following table shows the distribution of the solar water heater variance requests by island and option:

January 2010 - October 2018						
		#1 Impracticable or Cost-Prohibitive	#2 Renewable Energy System	#3 On-demand Gas	Denied	Percentage
HAWAII	4,218	1	127	4,078	12	63.8%
KAUAI	828	7	24	793	4	12.5%
MAUI	507	7	62	432	6	7.7%
MOLOKAI	34	0	2	32	0	0.5%
OAHU	1,028	7	122	895	4	15.5%
TOTALS:	6,615	22	337	6,230	26	100.0%
		0.3%	5.1%	94.2%	0.4%	100.0%

State Agency Electricity Consumption

Pursuant to Act 160 (SLH 2006), Section 168.5, establishes mandates to incorporate energy efficiency and conservation in government facilities, fleets and personnel practices.

Hawaii state agencies' electricity consumption declined 16.1 percent from 2005 (the baseline year) through 2018, but costs increased 43.3 percent during the same period due to rising electricity prices. Electricity costs, however, would have been even higher had electricity consumption not decreased.

Leadership in Energy and Environment Design (LEED)

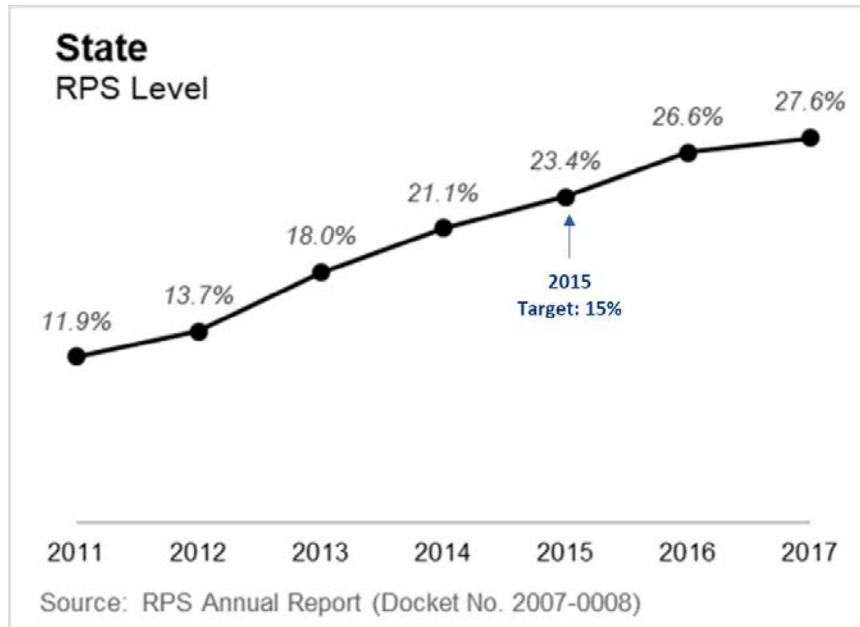
HSEO remains an active member of the U.S. Green Building Council (USGBC), the non-profit entity that administers the LEED program. Using less energy and water, LEED-certified spaces can save money for families, businesses and taxpayers; reduce carbon emissions; and contribute to a healthier environment for residents, workers, and the larger community. All new construction and major renovation of state buildings must meet LEED Silver standards, to the extent possible. As of September 2018, Hawaii had 197 LEED certified projects and 239 registered projects. The 436 total projects have a gross square footage of over 50.5 million gross square feet (USGBC's State Market Brief-Hawaii, September 2018). In 2018 Hawaii was back among the top 10 states for LEED certified project square footage per capita. With 4.5 million LEED-certified gross square footage, Hawaii rated

fourth highest state in the U.S. this year. The certified buildings included numerous private developments, as well as federal, state, and county public buildings.

As a member of the USGBC, HSEO helps to coordinate and plan the annual Hawaii Build and Buy Green Conference that features LEED-certified and net-zero energy projects in Hawaii. HSEO also continues to promote LEED and other green building training opportunities. Hookele Elementary School, Moana Surf Rider, Sheraton Waikiki, and The Royal Hawaiian were recently LEED-certified. The Hawaii Convention Center achieved LEED Gold status with new recycling and water conservation measures along with energy retrofits.

RENEWABLE ENERGY

When Gov. David Ige signed Act 97 into law in 2015, Hawaii became the first state in the nation to enact a renewable portfolio standards (RPS) mandate to generate 100 percent of electricity sales from renewable sources by 2045. Act 97 also set interim RPS targets for 2020 (30 percent), 2030 (40 percent), and 2040 (70 percent). Hawaii has exceeded its 2015 interim RPS of 15 percent by more than 8 percent and is on track to reach its 2020 interim target of 30 percent.



The Hawaii State Energy Office (HSEO) supports the deployment of investments to meet Hawaii’s RPS targets in the most cost-effective way possible. As DBEDT’s lead agency on energy matters, HSEO is tasked by the Legislature under HRS 196-41 to support the private sector’s attainment of Hawaii’s RPS and “develop a program to maximize the use of renewable energy and cost-effective conservation measures by state government agencies.” To achieve this goal, HSEO works with state and county agencies, energy stakeholders, and local communities to encourage and facilitate appropriate renewable energy development and conservation. The program target audience also includes emerging renewable energy producers, businesses and organizations interested in renewable energy, and key energy stakeholders and policy makers.

Renewable Energy Permitting and Siting Resources

Pursuant to HRS 196-4(4), HRS 196-4(5), HRS 196-4(6), HRS 196-4(7), HRS 196-4(12), HRS 196-4(13), HRS 196-41, and HRS 201-12.5, the Energy Resources Coordinator (ERC) shall encourage the exploration and development of indigenous energy resources, educate the public of Hawaii’s energy situation, facilitate the permitting of renewable energy projects, identify geographic areas with renewable energy resource potential, assist public agencies in the development of indigenous energy resources, and coordinate with federal energy programs and political subdivisions of the state (the counties).

Renewable Energy Projects Directory

energy.ehawaii.gov/epd/public/energy-projects-map.html

The Renewable Energy Projects Directory is the only interactive online map managed by the State of Hawaii that identifies all large-scale renewable energy projects and innovative energy projects in Hawaii and distinguishes them by development status: either existing/operational or proposed/under development. The Directory provides value by (1) demonstrating Hawaii's progress towards 100 percent renewable energy, (2) attracting more renewable energy investments in Hawaii by showcasing successful projects and innovations, (3) informing regulatory agencies, permitting, and policy decisions, and (4) informing interested communities and stakeholders of proposed and existing projects. The Directory was launched in 2012 and is updated periodically by HSEO as new project information becomes publicly available. As of November 2018, the Directory featured 108 projects with 72 existing/operational projects and 36 projects proposed or under development. The Directory recorded 15,639 pageviews from July 1, 2017, to June 30, 2018.

Developer & Investor Center and Self-Help Energy Suite

energy.hawaii.gov/developer-investor

The interactive Developer & Investor Center and Self-Help Energy Suite provide comprehensive information on the siting, permitting, and development of renewable energy facilities in Hawaii, which can be used by project proponents, regulatory agencies, interested communities, and other stakeholders. Launched in 2012, the Center and Suite offer technical assistance, self-help permitting tools, and permitting assistance through its Project Permitting Assistance and Resources website, which provides a guidebook on permitting renewable energy projects in Hawaii and individual briefs on approximately 200 county, state, and federal permit processes. The Center and Suite support informed project siting and design, which can lessen project impacts to the environment and surrounding communities while leading to more efficient project development. Smartly planned and sited projects can reduce project permitting and development soft costs and translate into lower electricity costs to the ratepayer. HSEO aims to regularly update these resources as requirements, policies, and procedures change.

Renewable EnerGIS

energy.hawaii.gov/resources/renewable-energis-map

Renewable EnerGIS provides geographic information system (GIS) data related to the renewable energy resource potential and siting of renewable energy projects at specific sites selected by the user. Developed in partnership with the Hawaii Office of Planning's Statewide GIS Program, EnerGIS supports efficient and low-cost initial project due diligence, which enables more appropriate renewable energy project siting and informed project planning and permitting; thereby decreasing project development timelines, costs, and impacts. By identifying site-specific attributes, EnerGIS informs regulatory agencies and other stakeholders of potential project impacts and permits. Originally built in 2012, HSEO released an upgraded version of EnerGIS on January 8, 2018, including new features, data, and graphics. EnerGIS recorded 3,757 pageviews from July 1, 2017, to June 30, 2018.

Renewable Energy Permitting Wizard

wizard.hawaiicleanenergyinitiative.org/

The Renewable Energy Permitting Wizard helps all stakeholders (developers, regulatory agencies, landowners, communities, etc.) understand the county, state, and federal permits that may be required for individual renewable energy projects in Hawaii, including procedures and prerequisites that dictate the sequence of approvals. By identifying approximately 200 permits, the Wizard supports informed project planning, which

reduces project development timelines, costs, and impacts. The Wizard supports community engagement by identifying opportunities for public participation as required by individual permit processes. Launched in 2011 and periodically updated by HSEO, the Wizard is now available in an open source software environment so it can be replicated by other jurisdictions. The Wizard recorded 2,397 pageviews from July 1, 2017, to June 30, 2018.

[e-Permitting Portal \(Hawaii Department of Health\)](#)

eha-cloud.doh.hawaii.gov/epermit/

The e-Permitting Portal provides online access to environmental permits administered by the Hawaii Department of Health's Environmental Health Administration (EHA), including land, air, and water permits required for renewable energy and other projects. e-Permitting provides access to environmental permit applications, related instructions and information, and allows for online application compilation and submission, online application fee payment and online submission tracking. HSEO provided early funding support for e-Permitting, which was launched in 2012-2013 and is currently managed by EHA. e-Permitting currently offers 24 online application forms. A total of 2,146 permit applications and revisions were submitted and processed through e-Permitting from July 1, 2017, to June 30, 2018, totaling \$308,450 in permit fees to EHA.

[Electronic Permitting and Asset Management \(Hawaii Department of Land and Natural Resources\)](#)

inforps-dp.hawaii.gov/DLNRInvPermitting/#/login

In partnership with the Department of Land and Natural Resources (DLNR), HSEO provided funding support for the development of electronic permitting and asset management systems for three DLNR programs involved in the permitting of renewable energy projects and the management of Hawaii's renewable energy resources: Dams Safety, Geothermal, and Native Invertebrates. These tools are designed to enable DLNR to electronically receive, process, and catalog permits for these programs, as well as electronically inventory and manage assets under their supervision. Launched in 2016, DLNR manages these resources. For DLNR's Engineering Division, 32 permits and 132 dams are entered into the system and over \$500,000 in annual fees have been invoiced with assistance from the new software platform. In FY18 the software expedited the issuance of 45 Native Invertebrate Permits by Division of Forestry and Wildlife (DOFAW). DOFAW also made the decision to expand the permit system to allow users to apply for statewide Rare/Endangered Plant Permits and Natural Area Reserves Special Use Permits. The compilation of these permits into a single interface has benefitted researchers, land managers, educators and consultants who are required to apply for permits, as well as the state staff and administrators responsible for reviewing and approving them.

Hawaii Solar Brightfields Initiative

To facilitate and investigate the reuse of underutilized contaminated sites in Hawaii for photovoltaic (PV) development, HSEO and the Hazard Evaluation and Emergency Response Office (HEER) within the Hawaii Department of Health are developing a database and GIS map of sites in Hawaii with known or perceived contamination and information relevant to screen individual sites for utility-scale PV development potential; i.e., solar resource, estimated output, slope, acreage, proximity to transmission, zoning, presence of sensitive environments, contamination/cleanup status, required monitoring/site controls, etc. When published, these resources will enable decisionmakers to easily conduct preliminary site due diligence to inform site development, compliance, and management needs, and support analysis to estimate potential site revenues and financial feasibility based on site capacity for energy output.

In 2018 HSEO secured cost-free technical assistance from the National Renewable Energy Laboratory (NREL) to create a master database of contaminated sites in Hawaii by combining numerous Hawaii and federal (U.S. Environmental Protection Agency) databases of sites in Hawaii with known or perceived contamination and information relevant to screen individual sites for utility-scale PV development potential. In June 2018 NREL delivered the master database and a methodology to site PV on contaminated sites. In July 2018 HSEO conducted a workshop to discuss the initiative with key stakeholders and to get input on how the state can best support reuse of underutilized lands for renewable energy development. The next steps planned for this initiative are to continue conducting stakeholder outreach, verify and update the data as needed in the master database for publication, develop a GIS map of contaminated sites, and update HSEO's existing tools (e.g., EnerGIS and Wizard) to include relevant contaminated site data.

Renewable Fuels Production Tax Credit

Pursuant to HRS 235-110.31(k) to establish a \$3 million/year renewable fuels production tax credit (RFPTC), HSEO was assigned the following duties and responsibilities associated with the RFPTC: (1) Verification and certification duties associated with the RFPTC in 2017; (2) Creation of forms to administer the RFPTC (i.e., Notice of Intent/Notice to Start Production and Credit Certificate forms); (3) Administer the RFPTC \$3 million/year aggregate cap limit; (4) Collect annual data related to the RFPTC (i.e., number of British thermal units (BTUs) produced and sold, types of fuels produced, number of facility employees and state of residency and projections for next year's BTU production); and, (5) Create and submit written reports to the Governor and Legislature.

Since its inception, the RFPTC legislation has been amended twice, once during SLH 2017 as Act 142 and again in SLH 2018 as Act 143.

- The main amendments Act 142 (SLH 2017) made to HRS 235-110.31(k) are as follows: (1) The term "credit period" was updated to cover the "calendar year"; (2) The term "renewable fuels" was updated to require that the renewable fuel is sold in Hawaii and meets the relevant ASTM International specification or other industry specifications for the "particular fuel" being produced; and (3) HSEO verification and certification duties under HRS 235-110.31(k) was replaced with a requirement that the RFPTC pursuing taxpayer obtaining an independent, third-party certified statement, at the taxpayer's expense, for the RFPTC being claimed. To this end, HSEO would then acknowledge receipt in writing to the taxpayer and issue a certificate back to the taxpayers that they can present with its tax filing to claim the RFPTC.
- The main amendments Act 143 (SLH 2018) made to Act 142 (SLH 2017) are as follows: (1) The term "renewable feedstock" was expanded to include "other renewable organic material, including, but not limited to logs, wood chips, wood pellets, and wood bark;" and (2) The minimum qualifying amount of renewable fuels that must be produced and sold to qualify for the RFPTC was reduced from 15 billion BTUs to 2.5 billion BTUs. All of HSEO's other aforementioned duties and responsibilities remained the same.

In 2018 HSEO created and published Notice of Intent/Notice to Start Production and Credit Certificate forms and are presently in the process of verifying and certifying the results of the single taxpayer claiming the RFPTC for Calendar Year 2018. At the same time, and in compliance with HRS 235-110.31(k) reporting requirements, we are reporting that the number and location of renewable fuels production facilities in the state and outside the state that have claimed the RFPTC for Calendar Year 2018 is: One facility located in the State of Hawaii at 16-240 Mikahala Street, Keaau, HI 96749. Additionally, the projected number of BTUs of renewable fuels production for

the succeeding year (2019) is anticipated to be 803,276,500,000 BTUs. The remaining outstanding reporting requirements—the total production of renewable fuels at the production facilities in the state and outside the state that have claimed a credit and the total number of BTUs of renewable fuels, broken down by type of fuel, produced and sold during the previous year—will be provided to the Legislature through subsequent reporting after completion of the verification and certification of the taxpayer’s RFPTC.

Regulatory Intervention

Pursuant to HRS 196-4(2) and HRS 196-4(17), the ERC shall conduct analysis of existing and proposed energy resource programs, evaluate the analysis conducted by government agencies and other organizations and recommend programs that represent the most effective allocation of resources for the development of energy resources and develop proposals for, and assess the effectiveness of policy and regulatory decisions.

Community-Based Renewable Energy (CBRE)

Act 100 (SLH 2015), codified as HRS 269-27.4, established a CBRE program to make the benefits of renewable energy generation more accessible to a greater number of Hawaii residents. Pursuant to Act 100 (SLH 2015), Hawaii’s electric utilities should collaborate with DBEDT and other stakeholders from the renewable energy industry and environment advocacy community on the development of a community-based renewable energy (CBRE) program in Hawaii. HSEO participated in the PUC regulatory proceedings for CBRE and provided relevant analysis and comments, helping to ensure that the state’s energy directives and interest are appropriately considered in the PUC’s decision-making process towards CBRE program implementation. Pursuant to the PUC’s Decision and Order dated June 29, 2018, the Hawaiian Electric Companies’ CBRE tariff, disclosure checklist, standard form contract, and Interconnection Agreement and Subscriber Form were approved. Additionally, the Hawaiian Electric Companies has launched the first phase of the CBRE program and since July 20, 2018, received 12 total applications across Oahu (4), Maui (4), Hawaii Island (3), and Molokai (1).

Throughout this regulatory process, HSEO participation included nine filings to the PUC, seven CBRE hearings and technical conferences, and 21 meetings to facilitate collaboration with key stakeholders and other related meetings associated with HSEO.

Distributed Energy Resources (DER) Proceeding – Technical

In response to PUC Order No. 35563 under Docket No. 2014-0192, HSEO submitted comments to the PUC pertaining to the Hawaiian Electric Companies’ “Proposed Revisions to Rule 14H and NEM Plus Tariffs.”¹ HSEO comments were focused on general support for the Proposed NEM Plus Tariff but requested that the PUC consider whether certain aspects pertaining to inverter requirements and system requirements were indeed consistent with the PUC’s prior ruling. In terms of Rule 14H, our comments highlighted the need for further clarity regarding the definitions of program system size and technical system size relative to the interconnection process. On October 21, 2018 the PUC issued an order on this proceeding in which it approved the Proposed NEM Plus Tariff in part and adopted HSEO’s recommendations regarding modifications to the definitions of Program System Size and Technical System Size definitions under Rule 14H intended to remove ambiguity.

¹ The Hawaiian Electric Companies filed “Proposed Revisions to Rule 14H and NEM Plus Tariffs” with the PUC on August 27, 2018 under Docket No. 2014-0192.

ENERGY PLANNING

Energy planning by the Hawaii State Energy Office (HSEO) takes a holistic perspective to achieve the statutory direction of the Hawaii Clean Energy Initiative (HRS 196-10.5) of managing the state’s transition to a clean energy economy. To achieve this objective planning activities include developing and maintaining “...a comprehensive and systematic quantitative and qualitative capacity to analyze the status of energy resources, systems, and markets,... and to recommend, develop proposals for, and assess the effectiveness of policy and regulatory decisions, and conduct energy emergency planning;” (HRS 196-4(17)). HSEO utilizes this capacity to “Conduct systematic analysis of existing and proposed energy resource programs, evaluate the analysis conducted by government agencies and other organizations and recommend programs that represent the most effective allocation of resources for the development of energy resources;” (HRS 196-4(2)). Energy planning requires addressing the interdependencies across energy sectors such as electricity² and transportation³, and supply channels for renewable and fossil fuel, and integrated with issues such as affordability, environmental sustainability, energy assurance and resiliency. Planning the transition to a clean energy economy includes activities that are both direct, related to the energy systems such as the grid and fuels infrastructure, and indirect, relating to supporting innovation and the business community. To achieve the transition to a clean energy economy HSEO works with state and county agencies, energy stakeholders and the local community to encourage and facilitate clean energy economy. The program target audience also includes emerging clean energy producers, businesses and organizations interested in energy efficiency and key energy stakeholders and policy makers.

Utility Business Model Analysis

Pursuant to HRS 196-4(11) the Energy Resources Coordinator (ERC) shall prepare and submit reports as may be requested to the governor and to the Legislature and Act 124 (SLH 2016) which directs HSEO to study and evaluate utility ownership and regulatory models and prepare a report to be submitted to the Legislature.

The goal of the utility business model study is to evaluate utility ownership and regulatory models in Hawaii by county and the ability of each model to: (1) Achieve state energy goals; (2) Maximize consumer cost savings; (3) Enable a competitive distribution system in which independent agents can trade and combine evolving services to meet customer needs; and, (4) Eliminate or reduce conflicts of interest in energy resource planning delivery, and regulation. The study will aid in understanding: (1) The long term operational and financial costs and benefits of electric utility ownership and regulatory models to serve each county of the state; (2) The process to be followed to form such ownership and regulatory models and; (3) If establishing such models would create synergies that are not currently available, particularly in the areas of: (a) Increasing local control over energy sources serving each county; (b) The ability to diversify energy resources; (c) Economic development; (d) Reducing greenhouse gas emissions; (e) Increasing system reliability and power quality and; (f) Lowering costs to all consumers. Through a competitive sealed proposals procurement, HSEO contracted London Economics International, LLC, to perform the study to evaluate utility and regulatory models for Hawaii. The study will engage a wide range of stakeholders and perspectives across all islands, providing multiple opportunities for input and participation. HSEO hosted a series of community meetings across the state to solicit community input for a study being done on future models for utility ownership and regulation in Hawaii. HSEO’s contractor, London Economics International, and

² 100 percent RPS Statute

³ Act 38 HRS ... “planning for the ultimate elimination of imported fuels for electric generation and ground transportation”.

subcontractor Meister Consultants Group, led the community workshops. The workshops were held statewide October 9-13, 2017, and June 13-22, 2018. The first set of meetings addressed the topic of utility ownership models exploring both the structure of the ownership model as well as what assets are owned by which entity within the ownership model. The second round of workshops focused on utility regulatory models with a focus on performance-based regulation.

The final report will be used to provide an unbiased assessment that will inform positions and future decisions on utility business models by the governor, Legislature, and public utilities commission and stakeholders. The estimated contract completion date is January 2019.

Energy Planning Quantitative and Qualitative Capacity

Pursuant to HRS 196-4(17), the ERC shall develop and maintain a comprehensive and systematic quantitative and qualitative capacity to analyze the status of energy resources, systems, and markets, both in-state and those to which Hawaii is directly tied, particularly in relation to the state's economy, and to recommend, develop proposals for, and assess the effectiveness of policy and regulatory decisions, and conduct energy emergency planning.

In support of this directive, HSEO is developing analytical tools to provide a holistic assessment of Hawaii's energy eco-system and the interrelationships of sectors and policies such as electric production and delivery, electrification of ground transportation, energy efficiency, customer adoption of distributed energy resources, land use, and energy resiliency.

Hawaii Advanced Visualization Environment Nexus (HAVEN)

HAVEN is focused on the visualization and analysis of energy system data. HAVEN is supported by a two-year \$225,076 grant from the U.S. Department of Energy (USDOE), in partnership with the University of Hawaii Laboratory for Advanced Visualization and Applications (LAVA) and the Hawaiian Electric Companies. Starting in 2017, the team developed Visualization #1 which visualizes the electric system and land use impacts of the Hawaiian Electric Companies' Power Supply Improvement Plan from the present through 2045. The format allows users to quickly analyze and understand complex energy data sets and more easily communicate this data and its meaning to stakeholders which should lead to better informed decision-making. Visualization #1 was constructed to be flexible and modular and, as such, provides a platform for future work. The first visualization was completed at the end of 2017. The second visualization, which will incorporate GIS layers such as sea level rise, is scheduled to be completed by the end of 2018.

HAVEN utilizes HSEO's recently completed Cyber-enabled Collaboration Analysis Navigation and Observation Environment (CyberCANOE) to provide a large, high-resolution platform for the visualizations. This environment will serve as the central platform for all visualization design, collaboration and presentation at HSEO. The visualization technologies incorporated into the CyberCANOE at LAVA and the techniques used by the CyberCANOE for other disciplines will be leveraged for the HAVEN project. As more CyberCANOEs and similar tools are developed, more opportunities to collaborate meaningfully with other groups nationally and internationally will become reality.

Hawaii Energy Visualization Initiative (HEVI)

HSEO's ongoing interaction with the USDOE has led to the creation of HEVI, an analytical model that will perform scenario analysis on Hawaii's comprehensive energy eco-system as well as feed data visualizations for program

and policy assessment. Through support from the USDOE's National Renewable Energy Laboratory (NREL), HEVI will further develop HSEO's quantitative and qualitative capacity to assist the development and assessment of regulatory and policy proposals and to conduct energy emergency planning. A beta version of the HEVI model is complete and HSEO continues to work closely with NREL to develop additional modules and functionality.

Petroleum Supply Monitoring

HSEO is utilizing tools that better organize and characterize existing petroleum reporting datasets in a format that provides historical context of normal petroleum operations during emergencies and helps identify potential fuel shortage situations. HSEO has made progress this year in increasing the effectiveness of these energy supply situational awareness tools to ensure consistency in information and databases.

Energy Assurance and Security

Pursuant to HRS 127A-3, the Hawaii Emergency Management Agency shall coordinate the activities of the agency with county and state emergency management agencies and other energy stakeholders. The Department of Business, Economic Development, and Tourism (DBEDT), as the designated Primary and Coordinating agency for State Emergency Support Function (ESF) #12 – energy, has a responsibility to support all state energy emergency response and recovery.

DBEDT Emergency Operations Plan

Pursuant to Gov. David Ige's Administrative Directive No. 15-01 and HRS 196-4(17), which directs the ERC to conduct energy emergency planning, HSEO provided input to DBEDT's Emergency Operations Plan (EOP).

The DBEDT EOP identifies key energy functions that must be maintained throughout a disaster, identifies energy emergency roles and responsibilities, and explains how HSEO will fulfill requirements listed in the State of Hawaii Emergency Support Function Annex for Energy (ESF #12).

As a result of this program activity, an essential HSEO energy assurance and energy emergency management plan was developed, substantially improved, and supported with in-house resources.

HSEO Emergency Operational Guidelines

HSEO is developing an Operations Guide to document specific operational steps to increase DBEDT's readiness to respond to emergency events which could result in an energy supply emergency. The guide is designed to aid staff, who may not have deep expertise in energy assurance, supporting the state response to a catastrophic incident so that they can activate critical energy assurance activities and work smoothly within an incident command framework. Working closely with numerous stakeholders across the state, the Operations Guide is scheduled to be completed by end of 2018.

Critical Energy Infrastructure Interdependencies MOU

USDOE, U.S. Department of Homeland Security, State of Hawaii Department of Defense, DBEDT, and U.S. Indo-Pacific Command signed the Critical Energy Infrastructure Interdependencies Memorandum of Understanding (MOU) to enhance collaboration among the parties to identify comprehensive and integrated critical risk assessment and mitigation approaches towards enhancing grid and critical infrastructure resilience throughout Hawaii.

As a result of its geographic isolation and energy ecosystem, Hawaii does not possess the same level of resiliency and redundancy present in the contiguous United States. Reducing threats to critical infrastructure is a shared goal among the MOU's state and federal partners. One of the MOU's strengths is its ability to leverage the partners' authorities, capabilities, and resources.

HSEO Training and Exercise Plan

Pursuant to HRS 127A, the State Catastrophic Hurricane Plan, and the State of Hawaii Emergency Support Function Annex, HSEO is implementing staff training and exercises focused on energy shortage emergencies.

Building and maintaining staff's energy emergency response expertise is a critical and ongoing process. As such, key staff participated in coordinated emergency management trainings that better prepare them to respond to critical needs in real world disaster response.

The value of reliable energy and the need to develop staff capabilities to prepare and respond to emergencies is of increasing importance as seen from the barrage of recent local weather and geological events (Hurricane Lane, Tropical Storms Olivia and Hector, and the Kilauea Eruption), as well as the devastation seen in national and international natural disasters. As a result of the training and exercise planning HSEO is in a better position to fulfill statutory responsibilities in the event of a natural or man-made disaster.

Updated Hawaii Energy Assurance Statutory Guidance

Pursuant to HRS 125C-1, the ERC, as the governor's authorized representative for energy shortages, has the authority to control the distribution and sale of petroleum products in times of shortage.

Given the current statutes are inadequate to meet the needs of government, industry, and the public, HSEO recommended a legislative measure to improve the state's ability to establish situational awareness on the status of energy supplies under a state of emergency. HSEO coordinated with industry, and county and state agency stakeholders to address deficiencies in Hawaii's fuel shortage response and energy emergency (energy assurance) statutes. The measure provides policy guidance on preserving the state's energy security and to ensure that fuel products and energy resources are made available to emergency services and the public in an orderly, efficient, and safe manner.

Regulatory Activities

Pursuant to HRS 196-4(2) and HRS 196-4(17), the ERC shall recommend, develop proposals for, and assess the effectiveness of policy and regulatory decisions, conduct systematic analysis of existing and proposed energy resource programs, evaluate the analysis conducted by government agencies and other organizations, and recommend programs that represent the most effective allocation of resources for the development of energy resources.

The following are regulatory activities which HSEO has actively provided support in relation to its responsibilities pertaining to planning for Hawaii's transition to a clean energy economy.

Hawaiian Electric Companies Integrated Grid Planning (Docket No. 2018-0165)

The Hawaiian Electric Companies filed their "Planning Hawaii's Grid for Future Generations, Integrated Planning Report", on March 1, 2018 ("IGP Report"). On July 12, 2018 the Hawaii Public Utilities Commission filed Order No. 35569 "Instituting a Proceeding to Investigate Integrated Grid Planning" noting that "with their IGP Report, the

HECO Companies propose an ambitious and holistic new approach to power system planning. If implemented successfully, this new IGP process could accelerate the state's progress towards a clean energy future.”⁴ With the IGP, the Hawaiian Electric Companies proposed to integrate the three previously distinct planning processes of generation, transmission, and distribution while simultaneously incorporating solution procurement as a component of the merged process. The goal of this innovative approach is to incorporate the diverse set of emerging technology solutions from all three planning areas based on current market pricing in order to optimize the transition to a clean energy system.

A central component of the planning process is stakeholder engagement including the IGP Stakeholder Council (“Council”) of which the HSEO is a member. The Council represents relevant government agencies, utility customers as well as local and national market stakeholder groups. The Council is a key element of and one of several stakeholder groups in the overall stakeholder engagement process for the IGP two-year process. The first Council meeting was held on August 30, 2018.

Energy Industry Information Reporting Program (EIIRP)

Pursuant to HRS 486J, the Energy Industry Information Reporting Act defines the industry entities that are affected by this reporting statute, the establishment of an energy data collection program and system, and details on the handling of any confidential data.

DBEDT collects and manages data from the petroleum industry including volumes of imported, refined, manufactured, exported, and distributed fuel by liquid fuel type to meet the requirements of government and industry, while promoting sound policy making, energy planning, energy assurance planning, and energy security under HRS 196-1(17).

Participation in the National Association of State Energy Officials (NASEO)

Pursuant to HRS 196-4(5), the ERC shall coordinate the state's energy programs with those of the federal government and other state governments.

HSEO attended a joint NASEO, National Association of Regulatory Utility Commissioners, and USDOE training on Distribution Systems and Planning in 2018. The sessions covered the physical components and functionality of distribution level resources and their interactions with user devices and upstream impacts to the system as well as policy and regulatory mechanisms for shaping the distribution system of the future. The training brought together State Energy Offices and Public Utilities Commissions from around the country with a focus on states’ engagement in the distribution planning process. Additionally, HSEO participated in NASEO's Energy Policy Outlook 2018 Conference and the NASEO 2017 Annual Meeting to connect and learn from state energy officials working on innovative energy policies and programs, and to engage with federal officials on priority energy issues. The conference convened the 56 State and Territory Energy Offices and policy leaders from the public and private sectors to learn about what new federal leadership may mean for energy policy, markets, states, and the future of energy infrastructure across the electricity, fuels, natural gas, manufacturing, efficiency, renewables, transportation, and building sectors.

⁴ Order No. 35569 “Instituting a Proceeding to Investigate Integrated Grid Planning” page 2

HSEO staff are active members of the NASEO Energy Security Committee which provides a forum for discussing energy data collection and analysis issues in relation to energy assurance, the Transportation Committee which examines electric and hybrid-electric, hydrogen, natural gas, propane, biodiesel, and ethanol vehicles and infrastructure, as well as the energy implications of automated and shared vehicles and serve as co-chair of the Fuels and Grid Integration Committee which focuses on issues related to the production, distribution, and consumption of electricity and liquid and gas fuels.

Innovation Strategic Plan and Innovation Center

Pursuant to HRS 196-4(1), 196-4(2), and 196-4(6), the ERC shall conduct analyses and formulate plans to recommend programs that promote the most effective allocation of resources for the development of indigenous energy that will benefit the state.

HSEO contracted with Cascadia Consulting Group, Inc., (Cascadia) to develop a strategic plan for clean energy innovation. Cascadia assessed the clean energy landscape in Hawaii through research and stakeholder engagement with 34 organizations to develop recommendations for how HSEO can catalyze innovation towards the state's mandated clean energy goals. The report identified key opportunities for HSEO to support clean energy innovation and included strategies and actions for this support. The three overall strategies for HSEO were: (1) Continuously monitor statewide energy needs and innovation opportunities; (2) Provide services to foster partnerships, set milestones, and fill gaps; and (3) Position Hawaii as a hub for innovation and collaboration.

Cascadia also looked into the possibility of developing a physical energy innovation center. Cascadia recommended against the development of a physical center at this time due to a lack of certainty of plans and partnerships and uncertain benefits of a center relative to the opportunity cost. The consultant, however, did recommend that HSEO continue its efforts to provide services such as advocating public and private partnerships, convening energy industry stakeholders, and support partnerships that could offer testing and showcasing clean energy innovations despite not developing a physical center.

Concurrently, HSEO had contracted with the architecture firm Perkins + Will, Inc., (Perkins + Will) to assess the potential space need for a physical clean energy innovation center. Perkins + Will's final deliverable report included an estimate of probable cost based on space requirements expressed by potential partners and recommendations for the U.S. Green Building Council's Leadership in Energy and Environmental Design compliance.

Energy-Related Economic Indicators

Pursuant to 196-4(1), the ERC shall develop criteria to measure the accomplishment of objectives for the optimum development of Hawaii's energy resources.

HSEO contracted with the University of Hawaii Economic Research Organization (UHERO), using funds from USDOE, to identify energy-related economic indicators with corresponding visualizations relevant to the state's energy goals. UHERO developed an initial set of indicators which was vetted by Hawaii energy data stakeholders. This initial set was refined to 13 indicators, four related to the electricity sector, four related to transportation, and five related to the overall economy. Visualizations were developed for these 13 indicators that were reviewed by the same Hawaii energy data stakeholders that did the initial vetting. UHERO's final deliverable is a data manual describing the selected indicators, specific data sources used, the method for selecting the final set of

indicators, notes to interpret graphs of indicators, and a chart identifying existing energy indicators published by other organizations.

CLEAN TRANSPORTATION

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.

The Hawaii State Energy Office (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. 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.

U.S. Department of Transportation Federal Highway Administration designation of Electric Drive Corridors across Oahu and Maui

Pursuant to HRS 196-4(1) and HRS 196-10.5, the Energy Resources Coordinator (ERC) shall formulate plans for the optimal development of Hawaii's energy resources and develop plans to assist the state and counties in the transition to a clean energy economy through the Hawaii Clean Energy Initiative (HCEI) program respectively.

The Federal Highway Administration (FHWA) designated two additional state of Hawaii highways as alternative fuel corridors. The nomination of two Hawaii Island corridors were coordinated by HSEO in cooperation with the Hawaii Department of Transportation (HDOT), Hawaii Center for Advanced Transportation Technologies, Hawaii Natural Energy Institute, County of Hawaii, the Hawaiian Electric Companies, and EV charging network provider, Greenlots.

The two new corridors are in addition to seven other alternate fuel corridors on Maui and Oahu approved by the FHWA in 2016 (I-H1/Hwy 72, I-H2/Hwy 99, and I-H3 on Oahu and Highway 30, Highway 311, Highway 31, Highway 32, Highway 36, and a portion of Highway 37 on Maui).

Hawaii Island's Highway 19 from Kailua-Kona to Hilo (Queen Kaahumanu Highway/ Kawaihae Road/ Hawaii Belt Road) and Highway 190 from Kailua-Kona to Waimea (Mamalahoa Highway) received the alternative fuel corridor designation because they meet the FHWA's criteria for placement of EV charging and hydrogen fueling stations along major highways. Hawaii Island's alternative fuel corridors have EV charging stations that are no further than 50 miles from each other and no more than 1 mile from the highway with plans for a hydrogen fueling station that will be located at the National Energy Laboratory of Hawaii Authority campus at Keahole Point just off Highway 19.

Volkswagen Settlement

Environmental Mitigation Trust

Pursuant to HRS 196-4(2), the ERC shall conduct systematic analysis of existing and proposed energy resource programs, evaluate the analysis conducted by government agencies and other organizations, and recommend programs that represent the most effective allocation of resources for the development of energy resources.

Gov. David Ige has designated the Department of Business, Economic Development, and Tourism (DBEDT) as the lead agency for purposes of administering the State of Hawaii's \$8.125 million allocation per the Volkswagen Settlement's Environmental Mitigation Trust. HSEO is the primary state agency charged with expending and executing the Eligible Mitigation Actions funded by the Trust.

In February 2018 HSEO initiated the public process required for developing Hawaii's Beneficiary Mitigation Plan by posting the "VW Request for Public Input" questionnaire on HSEO's Volkswagen Settlement website (energy.hawaii.gov/vw). 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. A total of 148 questionnaires from Oahu, 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.

Public input gathered from the questionnaire, data collection, analysis, and stakeholder engagement will be considered in developing the Beneficiary Mitigation Plan. In accordance with the VW Environmental Mitigation Trust agreement, the Beneficiary Mitigation Plan must include (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, and (4) expected ranges of emission benefits Hawaii estimates would be realized by implementation of the Eligible Mitigation Actions identified in the plan.

HSEO anticipates submitting Hawaii's Beneficiary Mitigation Plan to the VW Settlement Environmental Mitigation Trust's Trustee by end of 2018.

Zero Emission Vehicle Investment

Pursuant to HRS 196-4(5) and 196-4(8), the ERC shall coordinate the state's energy programs with the political subdivisions of the state and serve as consultant to public agencies and private industry on energy-related matters.

In addition to the Environmental Mitigation Trust, Volkswagen must invest \$2 billion over the next 10 years in zero emission vehicle (ZEV) infrastructure across the United States through its Electrify America initiative. ZEV Investment funding is a valuable catalyst to advance Hawaii's leadership in decarbonizing both its electric and transportation sector and can boost consumer confidence for a market sector eager to make sustainable investments in Hawaii's communities. HSEO submitted comments for Electrify America's Cycle 2 investments to evaluate opportunities for state fleet electrification in support of the investment of electric vehicle charging infrastructure across Hawaii.

State Energy Program (SEP) Formula Grant State Fleet Electrification Feasibility Study

Also supporting light duty vehicle investment (2018 new) Pursuant to HRS 103D-412 – Light-duty motor vehicle requirements for county and state agencies. HSEO initiated project work on a SEP Formula Grant, approved by the U.S. Department of Energy (USDOE), to develop a State of Hawaii fleet electrification feasibility study and implementation plan. This plan directly aligns with USDOE SEP Program priorities, addressing the need to develop/implement best practice clean fleet implementation plans and analysis. The project allows HSEO to work with one state agency to assess the feasibility of improving the efficiency of Hawaii’s local and state government light-duty fleet by analyzing the requirements and steps needed to transition the state’s light-duty fleet to electric vehicles.

Hawaii Department of Transportation Sustainable Transportation Forum

Pursuant to HRS 196-4(5) and 196-4(8), the ERC shall coordinate the state’s energy programs with those of the federal government, other state governments, and governments of nations with interest in common energy resources, and serve as consultant to public agencies and private industry on energy-related matters.

HSEO supports HDOT in the Sustainable Transportation Forum which provides stakeholders of various transportation sectors discussion opportunities to ensure that environment, social, and economic considerations are factored into decisions affecting transportation activities. Fuel and emission reducing tactics are addressed in the forum including, but not limited to, multi-modal solutions and reducing vehicle miles traveled. HSEO attends Sustainable Transportation Forum meetings annually. HSEO engages with an estimated 50 clean transportation stakeholders annually via its participation the Sustainable Transportation Forum.

HSEO also provides technical support to the Alternate Fuels Ground Transportation Working Group per the Department of Navy and State of Hawaii Memorandum of Understanding. Read more about this initiative in the Education and Outreach section under Military Collaboration.

Hawaii Climate Change Mitigation and Adaptation Commission

In 2016 Gov. Ige signed Act 32 Session Laws of Hawaii, 2017, making Hawaii the first state to enact legislation supporting implementation of the Paris Agreement. The Paris Agreement was signed by 195 nations on November 4, 2016, and is the largest, concerted global effort to combat climate change to date. Act 32 amended Hawaii Revised Statutes (HRS) Chapter 225P by renaming the Interagency Climate Adaptation Committee the “Hawaii Climate Change Mitigation and Adaptation Commission” (Climate Commission) as well as assigning various tasks to the Climate Commission related to climate change mitigation and adaptation.

The DBEDT Director is a member of the Climate Commission which provides direction, facilitation, coordination and planning among state and county agencies, federal agencies, and other partners about climate change mitigation (reduction of greenhouse gases) and climate change resiliency strategies, including, but not limited to, sea level rise adaptation, water and agricultural security, and natural resource conservation. The Climate Commission is placed under the Department of Land and Natural Resources for administrative purposes and is headed jointly by the Chairperson of the Board of Land and Natural Resources and the Director of the Office of Planning, or their designees. In addition to responsibilities as a member of the Climate Commission DBEDT-HSEO participates on the Permitted Interaction Group on Ground Transportation Emissions Reduction providing

technical support related to statewide clean ground transportation including potential fossil fuel reduction tactics and research on issues including emission and fuel economy standards for Hawaii.

Review of Emission and Fuel Economy Standards for Hawaii

To achieve the statewide transition to a decarbonized transportation sector, HSEO developed a white paper, “Review of Emission and Fuel Economy Standards for Hawaii.” In the white paper, HSEO researched Hawaii’s ability to adopt its own fuel economy standards or become a Section 177 Zero Emission Vehicle (ZEV) state by adopting California’s stricter emissions standards - both of which would encourage greater deployment and higher market penetration of electric vehicles across the state. It has been determined that Hawaii is unable to adopt its own fuel economy standards and is ineligible to become a Section 177 ZEV state due to its U.S. Environmental Protection Agency (EPA) “in-attainment” air quality status. States with EPA “in-attainment” status are states that currently meet the National Ambient Air Quality Standards. Due to Hawaii’s “in-attainment” status, the state also is ineligible to be a signatory to the Multi-State ZEV Memorandum of Understanding which commits to coordinated action to ensure implementation of ZEV programs.

Public Education Programs: Drive Electric Hawaii, HSEO Web Tools

Public awareness and education are key to the adoption of emerging technologies such as electric vehicles. Pursuant to HRS 196-4(7), the ERC shall conduct public education programs to keep the public informed of available resources and charging infrastructure to support the adoption of EVs. HSEO supports clean transportation stakeholder and industry groups that utilize public education to advance clean transportation adoption across Hawaii.

Drive Electric Hawaii

DBEDT is a member of Drive Electric Hawaii, a coalition of public and private entities dedicated to eliminating fossil fuel in ground transportation by focusing on supporting the electrification of ground transportation. Other state partners include the Division of Consumer Advocacy, Department of Transportation. Private sector partners include the Hawaiian Electric Companies, Kauai Island Utility Cooperation, Ulupono Initiative, and Blue Planet Foundation. The Drive Electric Hawaii partners meet monthly in addition to subcommittee meetings to coordinate activities.

HSEO Webpage and EV Stations App

HSEO responds to public inquires relating to clean transportation, while managing public-facing web resources, including the EV Stations Hawaii app and HSEO’s EV webpage (electricvehicle.hawaii.gov). These tools provide charging station and network locations and details, electric vehicle industry updates, and laws and regulations, respectively. EV Stations Hawaii app has 1,500 users and has recorded 7,300 user sessions in the past 12 months.

HSEO has built quantitative and qualitative capacity in clean transportation and consistent with HRS 196-4(8) serves as consultant to the governor, public agencies, and private industry on related issues. HSEO responds to inquiries from the governor, public agencies, the media, and private industry regarding clean transportation projects including electric vehicle adoption, charging station installation deployment and compliance with following statutes:

- HRS 291-71, which covers the designation of parking spaces for electric vehicles; charging systems; free electric vehicle parking; and exemptions from HOV lanes;

- HRS 196-2.5, which covers the placement of electric vehicle charging system- multi-family residential dwelling or townhouse unit; and
- HRS 103D-412, which covers light-duty motor vehicle requirements for county and state agencies.

Support of Regulatory Proceedings

Pursuant to HRS 196-4(2) and HRS 196-4(17), the ERC shall recommend, develop proposals for, and assess the effectiveness of policy and regulatory decisions, and conduct systematic analysis of existing and proposed energy resource programs, evaluate the analysis conducted by government agencies and other organizations, and recommend programs that represent the most effective allocation of resources for the development of energy resources. To advance clean energy goals and pursuant to HRS 196-4, HSEO submitted comments to the public utilities commission in response to Hawaiian Electric Companies (Companies) Electrification of Transportation Strategic Roadmap (EoT Roadmap).

In Docket No. 2016-0168 the Hawaiian Electric Companies stated their intent "to submit a programmatic filing with the Hawaii Public Utilities Commission (PUC) that will identify the value and opportunities associated with increased adoption of EVs, which "will lay the foundation for various levels of Company participation in the EV space and identify the Companies' EV strategy." In Order No. 34592, the PUC set a March 31, 2018, deadline for the Hawaiian Electric Companies to file their Electrification of Transportation (EoT) Roadmap. The Hawaiian Electric Companies filed their EoT Roadmap on March 29, 2018, in Docket No. 2016-0168. In Docket No. 2018-0135, the PUC invited public comments and established a comment period to address the Hawaiian Electric Companies' EoT Roadmap's prioritization of initiatives, specifically 1) Which specific actions should be prioritized by the Hawaiian Electric Companies in the near-term to encourage the growth and development of the EV market; and 2) Have the EoT Roadmap's recommendations properly prioritized near-term versus long-term utility initiatives.

HSEO submitted comments per Docket No. 2018-0135 stressing that access to smart charging will be central to the development of an EV market and will complement the pathway to 100 percent renewables in the electric sector. HSEO highlighted the EoT Roadmap identified initiatives which focus on smart charging, and initiatives which focus on access to charging, should be prioritized by the Hawaiian Electric Companies in the near-term as they are foundational elements to the strategic development of the EV market in which Hawaiian Electric can play a critical role.

EDUCATION AND OUTREACH

Pursuant to HRS 196-4(5) and HRS 196-4(7), the Energy Resources Coordinator (ERC) shall conduct public education programs and coordinate with federal government, other state governments, and governments of nations. The Hawaii State Energy Office (HSEO) conducts a myriad of collaborative public education and outreach activities to promote and promulgate the state's clean energy goals. HSEO's education and outreach initiatives reach a global audience and promote Hawaii's aggressive clean energy goals. HSEO's education and outreach target audience includes local and international energy stakeholders, policy makers, regulators, non-profits, and the community to help educate on the importance and progress of Hawaii's clean energy goals and initiatives.

Hawaii Clean Energy Initiative

Pursuant to HRS 196-10.5, there is established within Department of Business, Economic Development, and Tourism (DBEDT) a Hawaii Clean Energy Initiative (HCEI) program to manage the state's transition to a clean energy economy.

HCEI Overview

January 2018 marked the 10-year anniversary of HCEI. A proclamation event was held to acknowledge those that have been integral in leading the way to a clean energy future. With the support of U.S. Department of Energy (USDOE), the National Renewable Energy Laboratory in coordination with HSEO, a brochure and visual media were created to memorialize the achievements to date.

Hawaii-Okinawa Memorandum of Understanding (MOU)

Pursuant to HRS 196-4(5), the ERC shall coordinate the state's energy programs with those other state governments of nations with interest in common energy goals.

The Hawaii-Okinawa MOU for Clean and Efficient Energy Development and Deployment was signed by the USDOE; Ministry of Economy, Trade and Industry of Japan; State of Hawaii; and Prefecture of Okinawa in June 2010. The partnership fosters the development of clean and energy efficient technologies needed to solve global energy security and climate change challenges. In June 2015 the original signatories extended the MOU through 2020 for further collaboration on mutual shared interests in developing and deploying renewable energy, clean transportation, grid modernization, and energy efficiency measures.

The collaboration has resulted in the development of four committees: Okinawa Hawaii Clean Energy Promotion Project Committee, Ocean Thermal Energy Conversion Workshop Committee, Power System Technical Exchange Promotion Committee, and the Island Energy Technical Study Committee. HSEO has convened other energy stakeholder's participation including the Hawaiian Electric Companies, the Hawaii Natural Energy Institute, and the Pacific International Center for High Technology Research, as well as academia and utility representatives in Japan to support and promote clean energy activities in the established committees.

For fiscal year 2018, HSEO attended two Island Energy Technical Committee meetings in Naha Okinawa and participated in three business-to-business exchanges to promote clean energy innovation and economic development. In September of 2018, HSEO supported the 9th Ocean Energy and Economic Development Symposium & Workshop by providing a poster exhibit and video of Hawaii's clean energy goals and initiatives.

Military Collaboration

Pursuant to HRS 196-4(5), the ERC shall coordinate the state's energy programs with those of the federal government, other state governments, and the political subdivisions of the state with interest in common energy resources.

HSEO staffs the activities under the Department of the Navy (DON)–State of Hawaii Memorandum of Understanding (MOU) covers the period from June 21, 2016, through December 31, 2020.

The MOU established the partnership to collaborate on energy related issues of mutual benefit, in an effort to coordinate goals and build partnerships, as the parties have similar energy goals relating to the reduction of greenhouse gases, fossil fuel use reduction, energy efficiency, water consumption, use of renewable energy, and alternative fueled vehicles usage. As the DON is one of the largest employers in Hawaii and one of the top energy users, the partnership is a natural step for the two parties to take. The partnership established the following three working groups that meet regularly: Alternative Fuels in Ground Transportation, Renewable Energy, and Resiliency/Reliability.

The Alternate Fuels Ground Transportation Working Group, led by Navy Region Hawaii, focuses on integrating alternative fuel vehicles and fuel saving technologies which will cultivate an environment encouraging employees and organizations to adopt clean energy transportation solutions. The working group discusses strategies and opportunities to transition government-owned vehicles to an electric drive fleet and personally-owned electric vehicle fueling station management options on government property.

The Renewable Energy Working Group (REWG), led by HSEO's Renewable Energy Program manager, focuses on the viability of renewable energy options. REWG has been focused on three projects:

- Hawaii Solar Brightfields Initiative – As described earlier in this report, the purpose of this project is to consolidate and make use of data from U. S. Environmental Protection Agency and Hawaii Department of Health to facilitate and investigate the reuse of underutilized contaminated sites in Hawaii for photovoltaic (PV) development. As such, HSEO has been collaborating with REWG to obtain early consultation with the Navy, validate contaminated Navy sites, and to the extent possible, identify potential priority contaminated or underutilized lands in Hawaii for solar development.
- Waste to Hydrogen Energy Pilot Project – Navy Region Hawaii (NRH) is gathering preliminary data on potential waste streams to support justifying deployment of a pilot incineration system for testing. As part of the REWG, HSEO provided NRH relevant environmental and permitting information for waste to energy siting in Hawaii. All project partners and collaborators met in March 2018, to discuss technology overview, environmental, permitting, and regulatory considerations in support of a business and market study. NRH anticipates receipt of final business and market study, inclusive of waste stream analysis, by the end of 2018. Subsequently, it will decide if it ought to continue with the deployment of the test incineration system. Should the project move forward, HSEO plans to collaborate with REWG to identify best practices and issues from the permitting and emissions perspectives and develop a deployment and implementation plan which includes identification of funding.

The Resiliency/Reliability Working Group, led by the Marine Corps Base Hawaii (MCBH), focuses on the facilitation of information sharing in common interests, plans, and actions that promote energy resiliency and reliability with increasing intermittent renewables. One point of common interest is resiliency on the windward side of Oahu.

Alternative solutions to provide clean power generation on the windward side of Oahu can help both the state and MCBH restore power in the face of increasingly frequent hurricanes and other natural or man-made disasters.

Additionally, an Executive Committee convenes for briefings by the working groups and to provide additional information of similar projects in other jurisdictions.

2018 VERGE Hawaii: Asia Pacific Clean Energy Summit (VERGE Hawaii)

Pursuant to HRS 196-4(7), the ERC shall conduct public education programs to inform the public of the state's progress towards its clean energy goals. One of the education programs is the VERGE Hawaii: Asia Pacific Clean Energy Summit.

HSEO provided technical and outreach support for the 2018 VERGE Hawaii summit. This third annual event was held in June 2018 in Honolulu. This year's program highlighted Hawaii's role as an energy innovation leader and international test bed and included stakeholders from high school students to corporate Chief Executive Officers.

VERGE Hawaii drew nearly 700 energy stakeholders who participated in dozens of plenary and breakout sessions covered a wide range of topics such as decarbonizing Hawaii's ground transportation, lessons learned from Hurricane Maria's devastation of Puerto Rico, scaling the benefits of distributed energy resources, and a special session on sustainable tourism.

A highlight of the conference was a group of high school students appearing on the main stage to offer their vision of Hawaii's clean energy future in a session moderated by Luis Salaveria, DBEDT director. Students from Molokai, Hawaii Island, and Kauai were part of a group of students selected by the economic development boards in their respective counties to take part in this year's VERGE Hawaii.

A breakout session moderated by HSEO Administrator Carilyn Shon brought together a panel of experts to explore what Hawaii's energy system, economy and environment might look like in 2030 and 2045 as the state's clean energy transformation progresses.

HSEO Website

energy.hawaii.gov

Pursuant to HRS 196-4(7), the ERC shall conduct public education programs to inform the public of the state's progress towards its clean energy goals. A conduit of public outreach and education is HSEO's dedicated website that educates visitors on Hawaii's growing clean energy economy and HSEO's vision, role, and programs. The HSEO website provides information on the initiatives, activities, and programs of the energy office. Visitors can find information on energy planning, renewable energy, energy efficiency, and EVs. In February 2018 subpages were created for the Volkswagen Environmental Mitigation Trust. DBEDT was designated as the lead agency for purposes of administering the state's Trust allocation and HSEO is the primary agency charged with expending the Trust funds and executing the environmental mitigation projects funded by the Trust. The VW Settlement subpages provides information on the expending and executing of the Eligible Mitigation Actions funded by the Trust.

In fiscal year 2018 there were 185,882 page views to energy.hawaii.gov. The top five countries that visited the HSEO site were United States, Canada, Japan, South Korea, and United Kingdom. The top five pages visited were

the homepage, Developer & Investor Center, EV Stations Hawaii app and HTML5, EVs Charging Networks, and the Hawaii Energy Building Code.

Hawaii Clean Energy Initiative Website

hawaiicleanenergyinitiative.org

Pursuant to HRS 196-10.5 and HRS 196-4(7), there is established within DBEDT a Hawaii Clean Energy Initiative program to manage the state's transition to a clean energy economy with public education programs to inform the public of the state's progress towards its clean energy goals.

HSEO maintains the dedicated website for HCEI that educates visitors on the history of HCEI, goals and objectives, organizational structure, project teams, and legislative updates. The HCEI website informs visitors about the program that launched in 2008 as a partnership between the State of Hawaii and the USDOE. HSEO continues to make enhancements that include graphics and infographics, as well as simplifying pages and content. In 2018, the Progress Through Policy page was utilized during the legislative session to share highlights of key energy legislative proposals that were relevant to the HCEI stakeholders.

In fiscal year 2018 there were 21,039 page views to hawaiicleanenergyinitiative.org. The top five pages visited were the homepage, About page, Progress Through Policy, Goals and Objectives, and 2018 legislative measures page. The top five countries that visited the HCEI site were United States, Japan, Canada, China, and South Korea.

HSEO Press Releases, Publications, and Collateral

Pursuant to HRS 196-4(7), the ERC shall conduct public education programs to inform the public of the state's progress towards its clean energy goals. HSEO raises awareness and communicates clean energy progress via multiple communication channels.

HSEO issues press releases on newsworthy information and events that were sent to over 60 local and mainland media organizations as well as Hawaii policymakers. HSEO news releases consisted of public interest topics including online mapping tools, fuels production tax credit, online application for solar water heater variance requests, and the designation of alternative fuel corridors. HSEO press releases garnered media coverage as well as numerous social media hits.

HSEO develops and distributes publications and collateral material to raise awareness and communicate progress of clean energy efforts of HSEO and HCEI. To educate and update stakeholders on Hawaii's constantly changing energy landscape, HSEO distributes a quarterly e-newsletter, an annual report on Hawaii's energy data, and various collateral pieces.

In fiscal year 2018 quarterly e-newsletters and e-blasts communications were sent to over 13,000 subscribers. HSEO's e-newsletters stories focused on current, newsworthy subjects such as energy efficiency stakeholder charrettes, the Drive Electric Hawaii coalition, and Hawaii's new energy code. E-blast communications were used to notify the public of community meetings and public input surveys.

HSEO actively participates in its social media platform – Facebook, Twitter, and LinkedIn. HSEO posts daily messages on the office's activities to its 1,500+ followers.

In fiscal year 2018 HSEO's annual energy data update, Hawaii Energy Facts & Figures, was sent to 400 policymakers and local and international energy stakeholders. The energy report is a comprehensive collection of data on Hawaii's energy landscape and triggered numerous media stories.

Hawaii Energy Facts & Figures 2018 edition can be viewed at:

energy.hawaii.gov/wp-content/uploads/2018/06/HSEO_2018_EnergyFactsFigures.pdf

Promotional material was utilized to communicate initiatives and program messages. HSEO's new brochure, *State of Hawaii Strategic Energy Plan*, gives an overview of the state's four strategic goals: promoting energy efficiency, diversifying our energy portfolio, establishing a 21st century grid, and accelerating clean transportation. The foldout format provides an easy-to-read informational piece on the state's bold commitments that will require perseverance, hard work, and innovative thinking.

See brochure at:

energy.hawaii.gov/wp-content/uploads/2018/07/EnergyPlan-Brochure_June2018.pdf

2018 marks the 10th anniversary of the Hawaii Clean Energy Initiative. To commemorate the event, HSEO collaborated with the National Renewable Energy Laboratory to produce the *Celebrating 10 Years of Success* brochure and video. Both pieces highlight the leading-edge vision of HCEI with its mission of transforming Hawaii into a world model for energy independence and sustainability.

See brochure at:

hawaiicleanenergyinitiative.org/wp-content/uploads/2018/01/HCEI-Brochure_FINAL_Jan2018.pdf

View video at:

www.youtube.com/watch?v=Xaw4MysKsQ

ENERGY PROGRAM FUNDING

Funding for the Hawaii Clean Energy Initiative (HCEI) program is derived primarily from the Energy Security Special Fund (ESSF), established under HRS 201-12.8. The ESSF consists of:

- (1) The portion of the Environmental Response, Energy, and Food Security Tax specified under HRS 243-3.5;
- (2) Moneys appropriated to the fund by the Legislature;
- (3) All interest attributable to investment of money deposited in the fund; and
- (4) Moneys allotted to the fund from other sources, including under HRS 196-6.5.

In the fiscal year ended June 30, 2018, ESSF revenues were \$3,891,655, up 1.7 percent from the preceding fiscal year. The Hawaii State Energy Office's (HSEO) allocation of the Environmental Response, Energy, and Food Security Tax ("Barrel Tax") to the ESSF is critical for supporting HCEI, given Hawaii's aggressive goal to achieve 100 percent renewable energy in the electricity sector by 2045. With operating costs on the rise due to collective bargaining increases and other administrative expenses, the current allocation from the Barrel Tax is projected to become insufficient to fund the HCEI program beginning in Fiscal Year 2022.

Federal funding from U.S. Department of Energy (USDOE) and other federal agencies supplements HSEO's ESSF funding. USDOE's State Energy Program (SEP) provides an annual formula allocation of approximately \$280,000 to enhance energy security, advance state-led energy initiatives, and maximize the benefits of decreasing energy waste. SEP emphasizes the state's role as the decision maker and administrator for program activities within the state that are tailored to its unique resources, delivery capacity, and energy goals. USDOE also approved the repurpose of American Recovery and Reinvestment Act (ARRA) funds for eligible activities under the SEP and Energy Efficiency & Conservation Block Grant programs.

In January 2018 Hawaii became a designated beneficiary under the Volkswagen Diesel Emissions Environmental Mitigation Trust for State Beneficiaries, Puerto Rico, and the District of Columbia. Gov. David Ige designated DBEDT as the lead agency for the purposes of administering Hawaii's trust allocation. HSEO is the primary agency charged with expending the trust funds and executing the environmental mitigation projects funded by the trust, which provides a 10-year period, as of October 3, 2017, for expenditure of the VW funds. HSEO is developing the plan to allocate the \$8.125 million Hawaii will receive in the Volkswagen Environmental Mitigation Trust to promote the reduction of vehicle emissions in Hawaii.

Expenditures from the Barrel Tax Fund during Fiscal Year 2018 and the Spending Plan for the Hawaii Clean Energy Initiative Program for Fiscal Year 2019 are provided on the following pages.

Expenditures from the Energy Security Special Fund

ENERGY SECURITY SPECIAL FUND

	Actual FY2018	Projected FY 2019
BEGINNING FUND BALANCE	2,432,790	2,166,677
REVENUES		
Environmental Response, Energy and Food Security Tax	3,872,309	3,800,000
Investment Pool Interest	13,466	15,000
Other	5,879	
TOTAL REVENUES	3,891,655	3,815,000
EXPENDITURES		
Hawaii State Energy Office Operations	4,078,291	4,312,584
Programs:		
Renewable Portfolio Standards Program Support	24,992	171,211
Energy Efficiency Portfolio Standards Program Support	7,500	-
Education and Outreach	46,985	36,700
TOTAL EXPENDITURES	4,157,768	4,520,494
BALANCE	2,166,677	1,461,182

**Hawaii Clean Energy Initiative Program
Fiscal Year 2019 Spending Plan**

ANNUAL SPENDING PLAN

	State Funds	Other	Total
Hawaii State Energy Office Operations	4,312,584	200,000	4,512,584
Programs and Projects	357,911	1,397,147	1,755,057
	<u>4,670,494</u>	<u>1,597,147</u>	<u>6,267,641</u>

Spending plan is based on anticipated spending levels for FY19

FUNDING SOURCES:

State Funds

Energy Security Special Fund	5,981,677		5,981,677
General Funds	150,000		150,000

Federal Funds

DOE - State Energy Program (SEP)		641,044	641,044
DOE - SEP Competitive 2016 - HAVEN		176,103	176,103
DOE - Energy Efficiency & Conservation Block Grant *		500,000	500,000
DOE - SEP American Recovery & Reinvestment Act *		280,000	280,000
	<u>6,131,677</u>	<u>1,597,147</u>	<u>7,728,824</u>

* Repurposed ARRA Funds



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

DAVID Y. IGE
GOVERNOR

MIKE MCCARTNEY
DIRECTOR

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DTS:2019003131046HU

March 18, 2019

The Honorable Ronald D. Kouchi,
President and Members
of the Senate
Thirtieth State Legislature
State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki,
Speaker and Members of the
House of Representatives
Thirtieth State Legislature
State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

Please accept this letter as an addendum to the *Energy Resources Coordinator's Report* dated December 2018. As stated in the Renewable Fuels Production Tax Credit (RFPTC) section (pages 19-20) additional information would be provided upon completion of the verification and certification.

The following is the complete report information associated with the 2017 Calendar Year of the RFPTC certification in compliance with Act 202 (SLH 2016).

**Renewable Fuels Production Facilities in the State and Outside the State
that have claimed RFPTC:**

Number of claims: One (1) facility.

Location: 16-240 Mikahala Street, Keaau, HI 96749.

Total number of British thermal units (BTUs) sold in 2017:


Biodiesel renewable fuel: (1) Produced: 664,530,988,650 BTUs

(2) Sold: 492,147,420,300 BTUs.

The projected number of BTUs for the succeeding year:

750,000,000,000 BTUs in 2019.

Sincerely,


Gov Mike McCartney

c: Legislative Reference Bureau

ec: Governor's Office: Gov.ReportsDistribution@hawaii.gov

Lieutenant Governor's Office: LtGov.ReportsDistribution@hawaii.gov

Legislative Auditor: lao.auditors@hawaii.gov

Department of Budget and Finance: DBFLeg.DIR@hawaii.gov