This report fulfills the reporting requirements for:

Act 100, Section 7 (SLH 1999)
Act 122 (SLH 2019)
HRS 196 10.5(7)(c)
HRS 196 41(c)(3)
HRS 201 12.8(c)
HRS Section 201 104
HRS 235 110.31(l)

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

Hawai'i State Energy Office

2021 Annual Report

HAWAII STATE
Energy Office

www.energy.hawaii.gov

HAWAII STATE
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For screen reader users. The Hawai'i State Energy Office recognizes the use of diacritical markings of the Hawaiian language such as the 'okina (also called a glottal stop) and the kahakō (also called a macron). Please note that screen readers may not read or pronounce the Hawaiian words correctly.

HAWAII STATE
Energy Office

Message from Scott Glenn, Chief Energy Officer

The racing and sports analogies were everywhere at the COP 26 climate conference in November. As a member of the Hawai'i delegation, led by Gov. Ige, I attended workshops, speeches, and meetings where national and local leaders talked about the "race to zero," "the race to net-zero," "the sprint" to tackle climate change. We discussed whether it really was a sprint, or a marathon, or perhaps a relay event. Ultimately, we concluded that it is probably all of these, but zero (or net-zero) is not the goal and this is not a game.

Hawai'i is a world leader when it comes to mitigating climate change. In 2015 Hawai'i was the first state to commit to a 100 percent clean renewable energy future and we are making strong and steady progress toward that goal. The State exceeded the year-end 2020 renewable energy portfolio standard (RPS) for electricity of 30% by more than six percent, which is more than halfway to the 2030 RPS target.

While Hawaiian Electric's recently announced commitment to aggressively decarbonizing their electricity over the next few years is an important and necessary step towards achieving Hawai'i's clean energy goals, more is required than transitioning to renewable electricity to meet our goal to be carbon net-negative as quickly as practicable but no later than 2045.

This is why it was important for Hawai'i to attend COP 26 — to not only advance our message and call for action, but to learn from others. We need to think, and do, bigger. Iceland, where I visited following COP 26, has a lot in common with our state. It is relatively small and grapples with excessive tourism and active volcanos. It is a leader in innovation to decarbonize energy production along with pioneering negative emissions technology. It is using its abundant renewable resources — particularly geothermal and hydropower — to pull carbon from the atmosphere through direct air capture and mineralize it underground permanently. Iceland's abundant renewable resources also enable cheap power for industrial manufacturing and agricultural food production in greenhouses, promoting greater economic diversification.

Iceland is also beginning to tackle its transportation energy use, much like we are, throughout its value chain. Here at home, Hawai'i refines crude oil — mostly from very unfriendly countries — primarily into jet fuel for commercial and military aviation. The remaining distillate and residual products are used for gasoline, low sulfur fuel oil (electricity), bunker fuels, and so on. As we learned all too well in 2020, if the tourism market suddenly dries up, so does the demand for jet fuel. This puts downward pressure on the utilization of the island's refining capacity. It led to the shutdown of one of O'ahu's two refineries, and the cost to have on-island refining was transferred to electricity bill payers.

Imagine producing and refining our own hydrocarbons from air, water, and sunlight, waste gases, or plants grown locally in an appropriate way, rather than importing fossil fuels from hostile and unpredictable nations?

Across Europe, partnerships are coming into place to use direct air capture combined with hydrogen produced through electrolysis to make transportation fuels. It is essentially recycling the carbon already in the atmosphere and de-fossilizing fuel production. While it is in the very preliminary stages, the technology could allow Hawai'i to produce its own aviation and jet fuel for military and civilian use — using air, sunlight, and water as opposed to importing and storing fossil fuels.

Why is this important? Hawai'i's finite land often serves double or triple duty to house, feed, and provide energy for residents and visitors. Some communities are feeling singled out, exhausted, and overwhelmed by the pressure to host infrastructure when it feels like everyone else receives the benefits.

We believe renewable energy should complement our communities' quality of life — not compete with it. That is why HSEO is implementing strategies to incorporate community voices early into the development process to identify and incorporate innovative suggestions to make projects better by listening to host communities. It is also important that projects are developed with a more holistic view that provides real and tangible community benefits over the life of the project.

We are in a race against time and the stakes could not be higher. Nonetheless, I am more optimistic than ever that Hawai'i has what it takes to turn a threat to our way of life into an opportunity to be more self-reliant, economically secure, and repair our climate in the process. To go beyond net zero, we must decarbonize our economy through nature- and

engineering-based solutions to capture carbon and reduce urban “heat-island” effects, aggressively pursue energy efficiency measures, and deploy cutting-edge technological solutions — at the speed of value. Most importantly we must do all of it in a manner that respects community intelligence and diverse opinions. Hawai‘i cannot afford to lose the race to repair our climate.

With Aloha,

Scott J. Glenn
Chief Energy Officer
Hawai‘i State Energy Office

“Imagine producing and refining our own hydrocarbons from air, water, and sunlight, waste gases, or plants grown locally in an appropriate way, rather than importing fossil fuels from hostile and unpredictable nations?”

Scott Glenn, Chief Energy Officer

HAWAII STATE
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Executive Summary

Hawai'i is making strong and steady progress to end its dependence on fossil fuels and transition to a carbon-free economy by 2045. Living in the world's most isolated population center, there is broad support among the people of Hawai'i to eliminate the risk this dependence represents to the state's energy security, environment, and overall economic health. The Hawai'i State Energy Office (HSEO) is a catalyst for this transformation by serving as a trusted resource for the community and providing energy sector stakeholders with information, analysis, tools, and technical assistance needed to achieve Hawai'i's ambitious clean energy and climate goals.

HSEO is pleased to submit this annual report prepared in compliance with sections 6 and 7 of Act 100, Session Laws of Hawai'i 1999, requiring all departments and agencies to identify their goals, objectives, and policies to provide a basis for determining priorities and allocating limited public funds and human resources. This document also fulfills a requirement under HRS section 196-71 that HSEO submit a report to the Legislature no later than 20 days before the start of the session describing: the statutorily mandated activities along with progress in meeting HSEO's goals; progress toward meeting statewide energy efficiency, renewable energy, and clean transportation goals; and proposed legislation, if any.

This report lays out the priorities HSEO is focusing on to guide Hawai'i's transition to a resilient, clean energy economy. It also provides details of the programs developed and implemented by HSEO to turn these priorities into actions to help achieve Hawai'i's ambitious clean energy and climate goals. It concludes with a description of HSEO's funding and administrative changes, including staffing and the in-progress office reorganization.

Energy Assurance and Resilience

While all HSEO's priorities are essential to meet the state's clean energy goals, HSEO's top priority is to ensure the continued availability and delivery of reliable fuel and electricity energy to support economic recovery and meet the demands of a growing clean economy. In this role, HSEO is responsible for maintaining what is referred to as a "common operating picture" (COP)—a continuously updated overview of Hawai'i's energy system both from a planning and incident response perspective. HSEO utilizes a COP in its role as the primary and coordinating agency for the state under the Hawai'i Emergency Management

Agency (HI-EMA) for State Emergency Support Function 12: Energy (SESF-12) to coordinate and respond to "all hazards," including hurricanes and pandemics.

Actions undertaken by HSEO to support energy assurance and resilience include:

- **Energy Common Operating Picture:** The ongoing development of an energy system common operating picture (COP)—situational awareness supporting all levels of emergency incident management, homeland security, and across jurisdictions.
- **State Emergency Response Team (SERT):** Staffing the HSEO SERT to provide information, technical expertise and support to energy asset owners and operators, as well as state and local government agencies, to aid in overcoming challenges associated with the repair and restoration of the energy system. The SERT develops, maintains, and disseminates information and situational awareness products on the status of energy repair and restoration efforts and other information as appropriate.
- **FEMA Grant Implementation:** HSEO has pursued federal funding under the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program to increase the resilience of Hawai'i's energy ecosystem. Working with HI-EMA, HSEO secured a $600,000 Advance Assistance grant to assess the energy supply chain and the interdependencies of Community Lifelines—FEMA defined customers that provide essential services such as first responders, hospitals, water, and wastewater in response to, and recovery from, all hazards events.
- **Energy Assurance in Hawai'i Public Utilities Commission (PUC) Dockets:** Representing the State's interest in energy assurance and resilience, HSEO participated in dockets 2020-0090 and2020-0158 to assess the contracts' impacts on energy security in Hawai'i.

Renewable Energy Deployment

HSEO prioritizes support for renewable energy projects that limit negative impacts on communities, while advancing the state's decarbonized economy goals. Hawai'i's primary metric for measuring renewable energy penetration, the renewable portfolio standard (RPS) is 100 percent by 2045 with interim targets to ensure progress. The interim targets are 30 percent by 2020, 40 percent by 2030, and 70 percent by 2040. **Hawai'i exceeded the 2020 metric with a consolidated statewide RPS level of 36.07%.**

Progress toward the 2045 goal continues in 2022 with the retirement of the last coal plant in the state located on O'ahu. Transitioning to renewable sources that incorporate affordability and reliability for all residents while minimizing negative community impacts of the new projects needed to replace the 180-megawatt (MW) facility is a substantial undertaking. Toward this end, HSEO is tracking the deployment of 15 solar-plus-battery-storage projects and three standalone battery storage projects on O'ahu, Maui, and Hawai'i Island, a solar-plus-pumped-hydro project on Kaua'i, and geothermal and biomass projects on Hawai'i Island. .

Actions undertaken by HSEO to support renewable energy deployment include:

- **Powering Past Coal Task Force (PPCTF):** On March 30, 2021, Governor Ige established the PPCTF through Executive Order 21-01. The PPCTF supports the coordinated and timely review of the projects and programs needed to replace the last coal plant by September 2022. It is chaired by the Chief Energy Officer and consists of members from the City and County of Honolulu, the Mayor's Office, state agencies, state Legislators, Hawaiian Electric, non-government organizations interested in environmental protection and community engagement, and renewable energy developers. Information is provided by HSEO on its PPCTF webpage.
- **Hawai'i Renewable Energy Projects Directory and Permitting Wizard:** HSEO has upgraded, and will continue to upgrade, its lauded Hawai'i Statewide Energy Projects Directory, the only state-controlled source of information on the status of large energy projects that contribute to Hawai'i's renewable energy mandate. In June 2021, HSEO contracted a consultant to assist in updating the information contained in the Permitting Wizard; specifically, all the county, state, and federal permits. Updates are to be completed in 2022.

Energy Efficiency

HSEO prioritizes energy efficiency to maximize cost effective investments and foster high impact programs. Efforts to improve energy-efficient building codes and efficiency standards are recognized as cost-effective measures that set the bar for the minimum energy performance for commercial and residential buildings in Hawai'i. Especially in these critical times, energy efficiency saves money for agencies, businesses, and residents. **Hawai'i is keeping pace with its goal of reducing electricity demand by 4,300-gigawatt-hours by 2030 through efficiency and conservation measures.**

Actions undertaken by HSEO to support energy efficiency include:

- **International Energy Code Adoption:** As ex-officio voting member and Chair of the State Building Code Council, HSEO was instrumental in the Council's December 2020 adoption of the 2018 International Energy Conservation Code with Hawai'i-specific amendments.
- **Appliance Efficiency Standards:** Established standards for five appliances in January 2021 with the support of the Appliance Standards Awareness Project.
- **Hawai'i Green Business Program:** HSEO coordinates the Hawai'i Green Business Program (HGBP), which provides technical assistance to businesses to implement energy and resource-efficient practices and recognizes the success and value of the practices during an annual award ceremony. Now in its eighteenth year, the Hawai'i Green Business Program was established as a partnership between the HSEO, the Department of Health, the Board of Water Supply, and the Chamber of Commerce of Hawai'i.
- **Energy Efficiency Technical Assistance:** HSEO collaborates with and provides information and technical review to government agencies, professional associations, and educational institutions in Hawai'i to reduce energy use and to participate in performance contracting. In addition to in-house expertise, HSEO contracts with technical and contracting experts to provide in-depth review, analysis, and recommendations. **In 2021, State of Hawai'i buildings achieved a 20% decrease in energy usage from the 2005 baseline.**

Clean Transportation

HSEO has taken a leadership role in advancing the adoption of clean transportation across Hawai'i, including facilitating zero emissions vehicle (ZEV) deployment and associated electric vehicle charging and infrastructure, which directly contribute to reducing petroleum consumption and emissions in the transportation sector. To decarbonize the transportation sector, HSEO works with local communities; federal, state, and county agencies; energy stakeholders; and clean transportation stakeholders to encourage and facilitate the adoption of clean transportation technologies.

The availability of ZEVs for purchase and the accessibility of charging stations are significant factors for the advancement of clean ground transportation. HSEO has pursued opportunities to send market signals to vehicle manufacturers and lessors to increase the availability of ZEVs for purchase and rent throughout the state.

Actions undertaken by HSEO to support clean transportation include:

- **Medium- and Heavy-Duty Vehicle Memorandum of Understanding:** HSEO led the effort for Hawai'i to join with 14 other states and Washington D.C. in signing the Multi-State Zero Emission Medium- and Heavy-Duty Vehicle Memorandum of Understanding (MDHD MOU)**.**
- **Volkswagen Settlement:** Investment of $8.125 million allocated to Hawai'i as part of a federal settlement with Volkswagen to mitigate vehicle emissions through the replacement of medium- and heavy-duty vehicles, as well as the deployment of light duty vehicle supply equipment. HSEO in collaboration with the Hawai'i Department of Health Clean Air Branch (HDOH-CAB) has launched the Diesel Replacement Rebate (DRR) program available to public and private entities looking to adopt medium and heavy duty zero-emission vehicles.
- **EV Charging Infrastructure:** With the designation of alternative fuel corridors, the Federal Highway Administration (FHWA), is establishing a national network of alternative fueling and charging infrastructure along national highway system corridors. HSEO led the development and submittal of the application for an alternative fuel corridor on Kaua'i, thereby successfully receiving designations for all islands in Hawai'i. HSEO has allocated $50,000 towards the deployment of a DC fast charger on Kaua'i to support the successful application for a "corridor pending" designation.
- **Vehicle Miles Traveled/Active Transportation**: HSEO and the Department of Land and Natural Resources (DLNR) applied for and were awarded a grant from the U.S. Climate Alliance to hire a Vehicle Miles Traveled (VMT) and Active Transportation Specialist in December 2021. Reducing VMT is a form of energy efficiency. The least expensive energy is the kind that never has to be generated in the first place. Reducing the number of miles traveled contributes to overall energy efficiency. Throughout the two years of the grant-funded position, this position will focus on the development and implementation of strategies to reduce VMT in the State of Hawai'i through mode-shift, active transportation, and other associated means.

Stakeholder and Community Education, Outreach and Engagement

HSEO is prioritizing a more comprehensive public clean energy education, outreach, and engagement program, which is critical to achieving HSEO's broader mission to promote energy efficiency, renewable energy, and clean transportation. To increase living wage jobs, capital investment in energy efficiency and renewable energy projects, access to energy efficiency opportunities, and decarbonize the economy, the state must have the support of the broadest support possible. The increasing public challenges and vocalized community concerns about energy projects' impacts on host communities has made clear the need for a more focused effort to reach out to, and include, community in stakeholder engagements and collaborations to more effectively, efficiently, and equitably advance Hawai'i's clean economy goals.

Actions undertaken by HSEO to support stakeholder and community education, outreach and engagement include:

- **Clean Energy Education Program:** HSEO is working in partnership with the Hawai'i Department of Education to support the development and further expansion of clean energy education programs to empower Hawai'i's youth and citizens to meet the State's clean energy goals, while strengthening science, technology, engineering, and math (STEM) education and introducing students to potential energy job opportunities.
- **Stakeholder Outreach:** Participating in numerous educational and outreach events with staff serving as subject matter experts in a myriad of clean energy-focused topics.
- **Dedicated Website:** Updating and maintaining a dedicated website that educates viewers about Hawai'i's growing clean energy economy and vision and HSEO's initiatives, activities, and programs**. In FY21, there were 670,418 page views to energy.hawaii.gov, a nearly 98 percent increase over FY20.**

Data Analytics

HSEO is prioritizing the establishment and implementation of an energy ecosystem data governance framework. Accessible, reliable, high quality data undergirds all efforts to achieve a resilient clean energy decarbonized economy. Collection, analysis, and open access to quality data is critical to Hawai'i's successful transition to a decarbonized economy. Data supports the development of equitable and economically viable energy efficiency programs. Data also is used to monitor and track progress towards state energy

and climate goals, as well as objectives such as the conversion of medium- and heavy-duty vehicles.

Actions undertaken to support data analytics include:

- **Engage:** The continuing refinement of its "Engage" energy system modeling tool that can augment the energy system planning process by empowering more stakeholders to better understand and solve energy system planning problems.
- **HAVEN:** The deployment of its HAVEN visualization platform as a community engagement tool to support the analysis and communication of information contained within complex energy data sets highlighting energy and related sector interdependencies and scenarios.
- **Data Lake Construction:** HSEO has hired a Data Science Specialist utilizing federal funds to aid in the buildout of a "data lake" and to collaborate with energy data stakeholders throughout Hawai'i in developing a data governance framework. This framework will enable the Hawai'i State Energy Office and energy stakeholders to make more effective use of data by bringing it out of the wild and housing it in closer proximity to its demand.
- **Energy Fellows:** The HSEO entered a research agreement with the University of Hawai'i to work on a research project entitled "Energy Fellows Initiative in Support of Hawai'i." The Fellows will develop, analyze, and visualize specific energy policy scenarios and develop building energy and transportation data sets within the data governance framework that the Data Science Specialist is developing.

Energy Program Administration and Funding

The COVID-19 pandemic continues to impact Hawai'i's economy and HSEO's ability to perform its mandated duties as outlined above. Reduced state revenues resulted in significant cuts to HSEO's FY22 budget including positions and program funds.

HSEO has undertaken a host of initiatives in response to the COVID-19 emergency while continuing to carry out its core mission to help achieve a resilient, clean energy, decarbonized economy, despite restrictions on general funds resulting from the pandemic. HSEO is focusing its efforts simultaneously on support for energy efficiency and renewable

energy deployment, energy assurance, particularly regarding disaster preparedness and response, and job retention and creation to help fuel economic recovery.

The fiscal challenges facing HSEO because of the restrictions on general funds follow major changes to HSEO's structure and operation mandated by the Legislature in 2019, which involved shifting the Office's personnel and operating expenses primarily to general funds and removing the ESSF spending ceiling. Among other changes, HSEO's allocation from the Environmental Response, Energy, and Food Security Tax ("Barrel Tax") was reduced from 5 cents to 4 cents.

HAWAII STATE
Energy Office

Introduction

Since Hawai'i passed Act 123, Session Laws of Hawai'i 2015, the landmark bill making Hawai'i the first state in the nation to set a 100% renewable portfolio standard (RPS) for the electricity sector by 2045, HSEO has operated under this overarching goal. In 2018, Hawai'i enacted Act 15, to establish the zero-emissions clean economy target, which aims to sequester more carbon than is emitted within the state as quickly as practicable and no later than 2045. With the passage of Act 122, Session Laws of Hawai'i 2019, the Legislature established HSEO as an attached agency to the Department of Business, Economic Development, and Tourism (DBEDT), the appointed Chief Energy Officer position, and HSEO's mandate "to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient clean energy economy." Today a carbon free economy is HSEO's goal and unifies the 100% RPS and zero-emissions target.

HSEO is strengthening its role as a central gathering place for information, education, engagement, policy and project development guidance, and technical assistance to help realize our state's pathway to a resilient carbon-free economy. Under this mandate, and with the emphasis to support job creation, increase capital investment, and revenues because of the devastating economic impacts of the COVID-19 pandemic, HSEO is taking a leading role in support of a cleaner, more resilient recovery.

In accordance with Act 100, Session Laws of Hawai'i 1999, this year's annual report is structured in three parts:

1. Current priorities and looking forward,
2. An overview of HSEO activities within the framework of legislative mandates, and
3. Funding and administrative matters.

Part 1 focuses on HSEO's priorities in response to COVID-19 and the need for economic recovery. It describes the top priorities, actions taken, and next steps in ensuring that Hawai'i's economic recovery moves in a more resilient, clean energy direction.
Part 2 describes HSEO's ongoing activities to fulfill its statutory mandate organized by each topical area: energy efficiency, renewable energy, clean transportation, and a resilient clean energy economy.
Part 3 describes HSEO's current funding and administrative changes including staffing loads and the office reorganization into four components: Administrative; Operations; Resilience, Clean Transportation, and Analytics; and Energy Efficiency and Renewable Energy.

HAWAII STATE
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PART 1 Priority Objectives and Policies

Clean Energy to Achieve a Clean Economy

Hawai'i's commitment to fostering a clean economy and ending its dependence on foreign oil remains undeterred despite the lingering impacts from COVID-19. HSEO is focused on its mandate to decarbonize the economy through supporting deep carbon reductions throughout the entire energy ecosystem.

In fact, Hawai'i aims beyond net-zero toward a science-based target to be net-negative carbon as quickly as practical, but no later than 2045. That means simply adding renewable energy is not enough. HSEO remains focused on the following priorities to enable a resilient, clean energy economy.

1. Energy Assurance and Resilience
2. Renewable Energy Deployment
3. Energy Efficiency
4. Clean Transportation
5. Stakeholder and Community Outreach and Engagement
6. Data Analytics

Regarding these priorities, Act 100, Session Laws of Hawai'i 1999 specifically calls for:

- A statement of goals, including what the agency hopes to accomplish both short and long term;
- Objectives and policies, specifically setting forth how each goal can and will be accomplished;
- An action plan with a timetable indicating how the established objectives and policies will be implemented in one, two, and five years; and
- The process that the department or agency will use to measure the performance of its programs and services in meeting the stated goals, objectives, and policies.

In 2019, HSEO became an attached agency, and its goals were codified under Act 122 "to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient clean energy economy." HSEO's activities support these overarching goals in addition to lower energy costs and job creation. HSEO is integrating these priorities and workforce development needs to prepare residents for the opportunities presented with advancing energy efficiency, renewable energy, and clean transportation. HSEO's priority

objectives and policies, timetable, and performance measures to support these mandated goals are presented in a table starting on page 66.

The following is a thorough discussion of each priority. Additional information can also be found in Part 2 for specific activities undertaken this year.

Energy Assurance and Resilience

HSEO's top priority is to ensure the continued availability and delivery of reliable energy, both fuels and electricity, to support economic recovery and meet the demands throughout the state.

HSEO's State Emergency Response Team (SERT) is led by two dedicated staff members, one of whom is a temporary federally funded position, and is supported by additional HSEO staff serving as core team members, with all other HSEO staff receiving cross-training on support functions and roles for the core team members. Even with these measures in place, HSEO's ability to fully resource its SERT during long-duration events such as the ongoing COVID-19 pandemic, hurricanes, or volcanic activity has been strained due to recent staff attrition and hiring freezes. HSEO anticipates continued strain on SERT staffing in the future as impacts from emerging threats in cybersecurity, and hazards, such as major storm events, heat waves, sea level rise, and inland flooding increase in frequency and severity exacerbated by climate change.

Actions undertaken by HSEO to support energy assurance and resilience include:

Energy Common Operating Picture: The ongoing development of an energy system common operating picture (COP)—situational awareness supporting all levels of emergency incident management, homeland security, and across jurisdictions. A COP is essential to HSEO's role as the Primary and Coordinating agency under HI-EMA for State Emergency Support Function 12: Energy (SESF-12) to plan and prepare for and respond and recover from all significant energy disruptions and incidents through its SERT.

State Emergency Response Team - Energy: Staffing the HSEO SERT to provide technical expertise and support to energy asset owners and operators, as well as state and local government agencies, to aid in overcoming challenges associated with the repair and restoration of the energy system. The SERT develops, maintains, and disseminates information and situational awareness products on the status of energy repair and restoration efforts and other information as appropriate.

FEMA Grant Implementation: HSEO has pursued federal funding under the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program to increase the resilience of Hawaii's energy eco-system. Working with Hawaii's Emergency Management Agency (HI-EMA), HSEO secured a $600,000 Advance Assistance grant to assess the energy supply chain and the interdependencies of Community Lifelines—FEMA defined customers that provide essential services in response to, and recovery from, all hazards events such as first responders, hospitals, water, and wastewater. HSEO has also partnered with Hawaiian Electric to apply under FEMA's annual Building Resilient Infrastructure and Communities program for Critical Customer Hubs (CCH). CCH are microgrids that service multiple Community Lifeline facilities to support local communities in the response to, and recovery from, all hazards events.

Energy Assurance in PUC Dockets: Representing the State's interest in energy assurance and resilience, HSEO participated in dockets 2020-0090 Hawaiian Electric's *Application For Approval Of A First Amendment To Petroleum Fuel Supply Contract With Par Hawai'i Refining, Lc, Etc.*; and 2020-0158 Hawai'i Gas' *Application For Approval Of Petroleum Feedstock Agreement With Par Hawai'i Refining, LLC, And To Include Costs In The Fuel Adjustment Clause Of The Gas Company, LLC Dba Hawai'i Gas.* to assess the impact of the contracts to energy security in Hawai'i. The contracts were a consequence of the collapse in jet travel in 2020, and associated jet fuel demand, which clearly demonstrated that commercial aviation's demand for jet fuel subsidizes fuel and electricity prices across Hawai'i's economy. An outcome of the docket was recognition that a COP of fuel supply and demand statewide is necessary to fully understand the implications to energy security and the capability of existing infrastructure and market participants to completely import all finished fossil fuel products to Hawai'i in the event the remaining refinery were to shut down. HSEO is also participating in docket 2021-0098 *Joint Application For Approval Of The Transfer Of Upstream Membership Interests And Related Matters* concerning the transfer of ownership of Hawai'i Gas to Argo to represent Hawai'i's energy assurance and decarbonization policies.

Renewable Energy Deployment

HSEO prioritizes support for renewable energy projects, including rooftop- and customer-sited renewable energy, that limit negative impacts on communities while advancing the state's decarbonized economy goals. HSEO's activities in this area include tracking Hawai'i's progress using the primary metric for measuring renewable energy penetration, the renewable portfolio standard (RPS) of 100% by 2045; supporting near-term transformation of O'ahu's grid through the scheduled closure of a large coal-fired

power plant in 2022, with the Powering Past Coal Task Force; informing the public; and engaging on energy topics with regulatory and permitting agencies. Additional support of the objective is provided through on-line tools, reports, studies, and directories providing credible, publicly accessible information.

Hawai'i's electric utilities once again increased the amount of renewable electricity on their grids reaching a RPS of 36.07% for calendar year 2020, exceeding the level required by HRS 269-92 of 30% in 2020. RPS levels and amount of renewable energy generation, by year and type, are shown in the figures.

Figure 1 - Reported RPS Levels, Hawaiian Electric Companies, 2013-2020

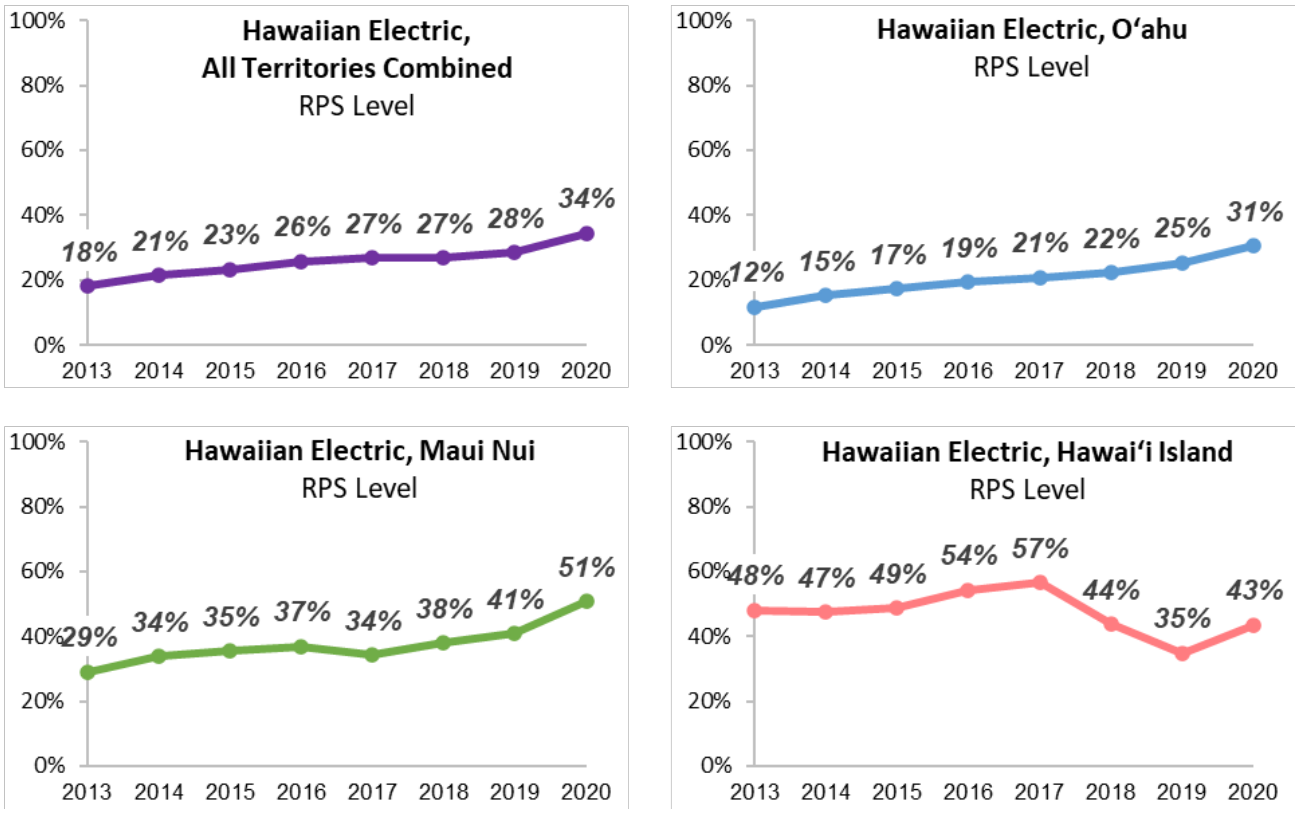
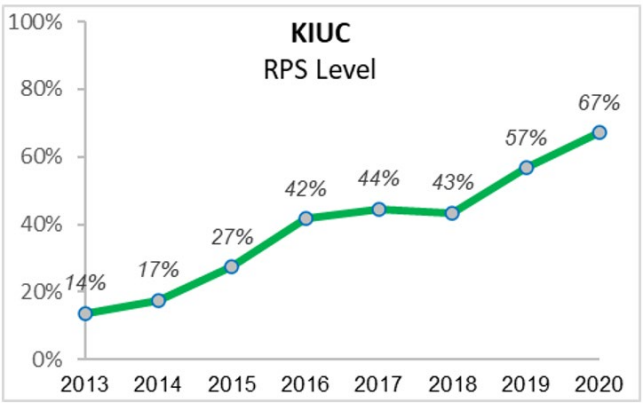


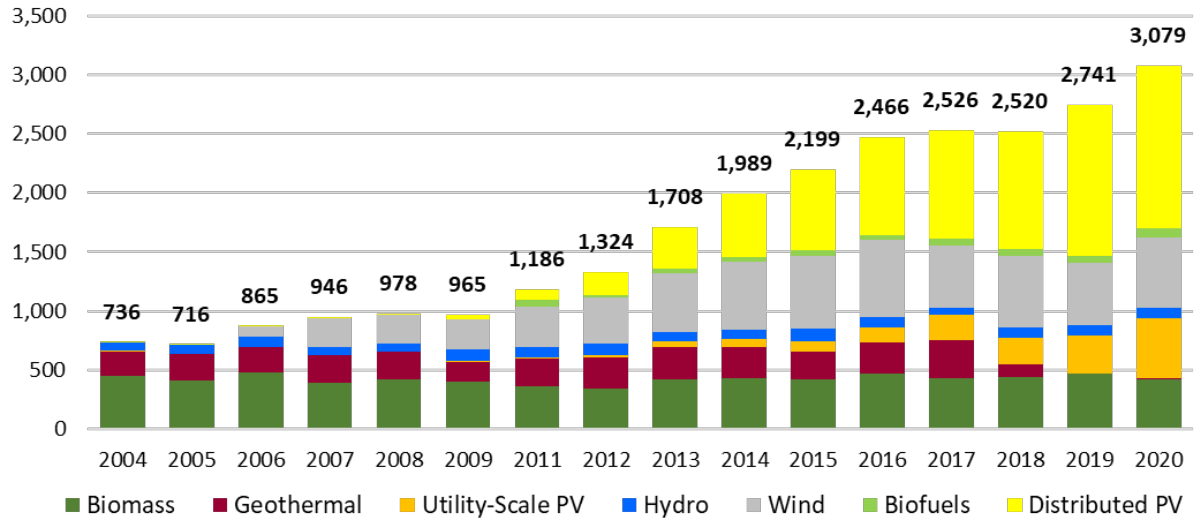
Figure 2 - Reported RPS Levels, Kaua'i Island Utility Cooperative (KIUC), 2013-2020



The highest RPS level was reached by Kaua'i, which at 67%, is almost at the 2040 target already. Often, Kauai's grid operates at 100% renewable generation for several hours during the day.

Reaching or exceeding the subsequent targets (40% by December 31, 2030; 70% by December 31, 2040; and 100% by December 31, 2045) will require continued and increased levels of effort and engagement.

Figure 3 - Hawai'i Renewable Energy Generation (GWhs), 2004-2020



Transitioning to renewable sources that provide affordable, reliable electricity while minimizing negative community impacts is a substantial undertaking. Act 23, Session Laws of Hawai'i 2020, prohibits the approval of a new, modified, or renewed power purchase agreement for coal-generated electricity, and after December 31, 2022, prohibits the issuance or renewal of covered source air permits for coal-burning electricity generation facilities. HSEO is tracking the progress of 15 solar-plus-battery-storage projects and three standalone battery storage projects on O'ahu, Maui, and Hawai'i Island; a solar-plus-hydro project on Kaua'i; and geothermal and biomass projects on Hawai'i Island. Customer-sited resources and programs will contribute to the transition.

Actions undertaken by HSEO to support renewable energy development include:

Powering Past Coal Task Force: On March 30, 2021, Governor Ige established the Powering Past Coal Task Force (PPCTF), through Executive Order 21-01 to "convene stakeholders to increase transparency, coordination, collaboration, and urgency to timely facilitate, coordinate, and align project development and reviews by Hawaiian Electric, state, and county agencies for those measures anticipated to provide electricity for Oahu to replace the coal plant's electricity…" The PPCTF is chaired by the Chief Energy Officer and consists of members from the City and County of Honolulu, the Mayor's Office, state agencies, state Legislators, Hawaiian Electric, non-government organizations interested in environmental protection and community engagement, and renewable energy developers. Information is provided by HSEO on its PPCTF webpage. The PPCTF is not a policy or decision-making body and seeks only to improve coordination in the review of the projects and programs intended to replace the coal plant. Hawaiian Electric has stated, "The Companies have benefitted from participation in the Powering Past Coal Task Force, where the utility, developers, state and county permitting agencies, and community leaders regularly communicate and collaborate on projects under development and are open to the establishment of a similar forum to discuss issues related to the retirement of [Kahului Power Plant]." Expanding the work of the PPCTF to other islands has been requested by Hawaiian Electric and renewable energy developers.

Informing the Public of the Hawaiian Electric Stage 1 and 2 Projects: In 2018, Hawaiian Electric issued its first large request for new renewable energy for the islands it serves called "Stage 1." In 2019, Hawaiian Electric issued its second large request for new renewable energy for the islands it serves called "Stage 2." Collectively, these Stage 1 and 2 projects will provide the renewable energy necessary to replace several large fossil fuel power plants. Some of these projects are still seeking PUC approval, most are now seeking their necessary permits and conducting the required interconnection studies, and a few of them are under or near construction.

Given the importance of these projects, and the need for communities to be informed of them, in FY21 HSEO continuously updated its Hawaiian Electric Stage 1 and 2 Renewable Energy Projects webpage and actively tracks all Stage 1 and 2 projects. In addition to providing information on each project, this page identifies opportunities for the public to provide input and learn about these projects. HSEO updates this webpage as new information is made public. **From July 1, 2020, to June 30, 2021, there were 12,112 page views to the Stage 1 and 2 projects webpage.**

Comment Letters and Testimony: HSEO engages on the larger renewable energy projects proposed throughout the state, often through formal environmental review and permitting processes. In addition to quantifying the renewable energy benefits of each project, HSEO's comment letters seek to inform readers of the energy impacts of the proposed project and to identify any outstanding issues raised through various public input processes.

In FY21, HSEO provided written comments on the following project reviews including some of Stage 1 and 2 Hawaiian Electric projects and the solar plus pumped hydropower storage project proposed on Kaua'i:

- AES Kuihelani Solar: County Special Use Permit
- Barbers Point Solar: Draft Environmental Assessment
- Mahi Solar: State Special Use Permit
- West Kaua'i Energy Project: Draft Environmental Assessment

HSEO also testified verbally in front of the Hawai'i Land Use Commission, City and County of Honolulu Planning Commission, and the Honolulu City Council.

HSEO provided comment letters for larger planning efforts including the Land Use Ordinance revisions being undertaken by the City and County of Honolulu Department of Planning and Permitting and the Hawai'i Department of Land and Natural Resources Division of Forestry and Wildlife's Hawaiian Hoary Bat Guidance for Wind Energy Projects.

In March of 2021, HSEO was formally admitted as a participant in PUC Docket No. 2020-0218 in the matter of the Application of Kaua'i Island Utility Cooperative for Approval of the Power Purchase Agreement (PPA) for their pumped storage hydroelectric project. Given the complexities of this project and its need for interagency and interdisciplinary coordination, HSEO possesses unique expertise, past involvement, and standing on matters related to

renewable energy, energy storage, decarbonization, and energy security. On December 1, 2021, the PUC approved the PPA for the project, which is still undergoing environmental review under HRS 343.

Community-Based Renewable Energy: Community-based renewable energy (CBRE) is also commonly referred to as "community solar" and is referred to by Hawaiian Electric as "Shared Solar." Act 100, Session Laws of Hawai'i 2015, directed the PUC to establish a community-based renewable energy tariff (HRS Section 269-27.4). The details of the tariffs and programs have been (and are being) developed under PUC Docket No. 2015-0389. The CBRE program provides an avenue for utility ratepayers to invest in solar projects where they do not have the means or ability to invest in their own rooftop solar installations. In FY21, 124 documents, consisting of over twenty-one thousand pages, were filed in the docket, many of which were tariff pages and model contracts. HSEO developed a webpage to explain the CBRE process, attended public and working group meetings, and will continue to work with project developers ("subscriber organizations"), the public, and communities for successful implementation of the CBRE program.

Real Property Tax Assessments – O'ahu: Ongoing communication with project developers during FY21 enabled HSEO to be productively involved in an issue that surfaced in August 2021. HSEO was informed by a renewable energy project developer that two of their existing solar energy projects on O'ahu received property tax bills which increased their tax liability from approximately $2,500 per year to over $800,000 per year; an unexpected increase of 31,900%. The new assessment was based on a new interpretation of the exemption available for renewable energy projects under Revised Ordinance of Honolulu (ROH) Chapter 8, Section 10.15 and the tax assessment process under Section 8-7.1, which states that real property should be "classified, upon consideration of its highest and best use" which resulted in the classification of the solar energy to be industrial rather than the zoned agricultural use. The new tax treatment jeopardized the viability of these projects and all other solar projects in existence and under development because this was not the tax treatment the projects assumed when they completed their financing and competitive utility procurements in many cases. If not remedied, the new tax treatment would also significantly increase the cost for any new renewable energy projects on lands other than those zoned industrial. With HSEO-led stakeholder engagement, an interim solution was provided by the City's approval of Bill 39 in December 2021. HSEO continues to work with stakeholders on a long-term solution to this issue.

Federal Import Restrictions / Tariffs on Solar Panels: Another situation brought to the attention of HSEO after the close of the fiscal year involved a national issue. In mid-August 2021, a group of anonymous solar companies under the name American Solar Manufacturers Against Chinese Circumvention petitioned the U.S. Department of Commerce to impose punitive tariffs of 50% to 250% on crystalline silicon solar modules manufactured in Southeast Asia (Malaysia, Vietnam, and Thailand). These petitions sought to extend the same punitive tariffs currently imposed on crystalline silicon solar modules manufactured in China. The petitions represented a significant threat to major suppliers, including those with projects proposed in Hawai'i. If implemented, the new proposed tariffs would have likely destroyed the financial viability of many solar projects now under development in Hawai'i. Quick work by Governor David Y. Ige, with the support of HSEO, and by other governors and representatives from across the country, contributed to a dismissal of the petitions by the Department of Commerce.

Onshore Wind Setback for O'ahu – Testimony and Mapping: In November 2019, the City and County of Honolulu City Council introduced Resolution 19-305 proposing to amend the Revised Ordinances of Honolulu to increase the existing setback distance from one foot of setback for each foot of height (measured from the highest vertical extension of the system), to five miles from a property line. HSEO provided written and verbal testimony asking the City and County of Honolulu Planning Commission to consider a setback of at least one mile based on research conducted by HSEO.

In May 2021 the City Council introduced Bill 28, Bill 29, and Bill 30 that would establish setback distances of 1.25 miles, 1,500 feet, and 5 miles, respectively from residential, country, and apartment mixed-use zones. HSEO again provided written and verbal testimony on each bill, all of which are still active with the City Council. HSEO testified that a setback greater than 1,500 feet was needed to protect surrounding communities and regain public confidence in onshore wind as a viable renewable energy resource option for O'ahu. Conversely, HSEO testified a 5-mile setback would effectively ban onshore wind development on O'ahu and inhibit the ability for O'ahu to reach 100% renewable energy generation by 2045. HSEO believes onshore wind is necessary in some capacity for O'ahu to achieve this mandate.

HSEO provided testimony in support of the intent of Bill 28 but felt more research was needed to determine what impact the 1.25 miles setback would have on the potential for future wind development, as well as the setback's adequacy to protect human health. As a follow-up to the Bills' first reading, HSEO developed maps and conducted spatial analysis.

The analysis provided an estimated change in the technically suitable area using Honolulu zoning and wind data from the National Renewable Energy Laboratory. HSEO determined that a setback distance equal to or greater than one mile was sufficient to protect from concerns of shadow flicker, audible and inaudible noise, and blade throw while also leaving enough technically suitable areas open for wind development. HSEO's research did not include any analysis of landowner acceptance or interest in wind energy development, nor did it include cost analysis. As the Bills are still alive, HSEO continues its research and outreach on this important topic.

O'ahu Offshore Wind Cost Feasibility Study: In 2020, the U.S. Bureau of Ocean Energy Management (BOEM) initiated a study to determine the cost and feasibility of developing an offshore wind project in the waters off O'ahu and potential visualization considerations. The purpose of the study is to inform decision-makers and interested parties on the costs of developing an offshore wind energy project with floating turbines in different regions surrounding O'ahu. BOEM retained the National Renewable Energy Laboratory (NREL) to conduct the study and HSEO served as the primary point of contact in Hawai'i for the study. This study is only one small part of the discussion as it does not include information on many other important impacts that must be considered for a floating offshore wind project in Hawai'i, such as Native Hawaiian culture, community, ecology, environment, recreation, and larger economic considerations.

Hawaiian Islands Humpback Whale National Marine Sanctuary Advisory Council: HSEO serves as a non-voting member of the Hawaiian Islands Humpback Whale National Marine Sanctuary Advisory Council (SAC), which was established in March 1996. The SAC provides advice to the Sanctuary Superintendent on the Sanctuary's operations. Council members share information about the Sanctuary with the public and bring the concerns of constituents and the public to the attention of sanctuary management.

In FY21, HSEO participated in meetings of the SAC and arranged for presentations on energy-related topics. In September 2021, the SAC voted unanimously to establish a new Offshore Energy Working Group (OEWG) with the purpose to focus on energy projects and their impacts on marine mammals and their habitat. The OEWG was established largely in response to the O'ahu Offshore Wind Cost Feasibility Study funded by BOEM to explore the cost feasibility of offshore wind development off O'ahu. HSEO staff currently serves as the Chair of the OEWG. Existing and proposed offshore energy projects in Hawai'i include offshore wind, ocean thermal energy conversion, wave energy, and offshore fuel terminals or moorings.

Renewable Energy Permitting Wizard Upgrades: Hawai'i's many permits and regulations serve to protect its unique environments and communities. Accordingly, one of HSEO's statutory duties under HRS 196-72 is to facilitate the efficient, expedited permitting of renewable energy projects to achieve Hawai'i's renewable energy goals. One of the ways HSEO accomplishes this is through its online Renewable Energy Permitting Wizard. The Wizard helps to identify the county, state, and federal permits and approvals that may be required for large development projects in Hawai'i and the sequence in which the approvals may be obtained. The Wizard facilitates the appropriate siting of large projects and serves to reduce soft costs associated with project siting and permitting due diligence. Users who complete an evaluation using the Wizard are provided a Permit Plan with the recommended permit sequencing, timelines, and application processes.

The Wizard is the only online tool available that can identify all the permits required for large infrastructure projects in Hawai'i and feedback provided to HSEO has been largely positive since its original launching in 2012.

In June 2021, HSEO initiated a project to update the information contained in the Wizard; specifically, all the county, state, and federal permits contained in the Wizard. The evaluation process used by the Wizard will also be reviewed for methods to increase efficiency for Wizard users. HSEO anticipates the Wizard updates to be completed in 2022.

Management of Energy Materials: Achieving Hawai'i's renewable energy goals require forethought and care for future impacts. Clean energy products imported to Hawai'i, such as photovoltaic panels and batteries, eventually will have passed their anticipated operational lives.

In March 2021, HSEO provided comments to the Hawai'i Department of Health (DOH) through its process to develop new Hawai'i Administrative Rules (HAR) to regulate discarded solar PV panels. The new HAR establishes streamlined standards for handling hazardous waste solar panels under the universal waste program while maintaining protection of human health and the environment. The new HAR became effective on June 7, 2021. HSEO was one of the few stakeholders to offer input on this process.

On June 28, 2021, Governor David Y. Ige signed Act 92 which directed the Hawai'i Natural Energy Institute (HNEI) to conduct a comprehensive study to determine best practices for disposal, recycling, or secondary use of clean energy products in the State of Hawai'i. A preliminary report is due to the Legislature before the 2022 session and the final report is

due in 2023. In FY21 HSEO provided data, subject matter expertise, and industry information in support of the study.

Hawai'i Energy Projects Directory: HSEO works to regularly update the Hawai'i Statewide Energy Project Directory, which is the only state-controlled public resource that identifies existing and proposed renewable energy projects in Hawai'i. The Directory is an important resource to inform the public, developers, and regulators of large projects proposed in their areas and to track the status of large energy projects.

In FY21, HSEO maintained and updated the Directory as public information on each project became available. HSEO transitioned the Directory to a data-based geographic information systems (GIS) platform that facilitates the sharing and analysis of more project-specific information. The new Directory, launched in early 2021, includes a wider range of energy projects in Hawai'i, including the fossil fuel units that play a critical role in Hawai'i's energy mix. It also includes added interactive layers such as zoning and land use districts, tax map parcels, transmission lines, and other items aimed to inform the user of the various energy projects throughout the state and their characteristics. **From July 1, 2020, to June 30, 2021, there were 12,955 page views to the Directory.**

Renewable EnerGIS Mapping Tool and Hawai'i Brightfields Initiative: Throughout 2021, HSEO maintained two publicly available online tools to support the informed siting and permitting of renewable energy projects in Hawai'i: Renewable EnerGIS and the Hawai'i Brightfields Initiative.

Siting projects in areas with limited and coveted land such as Hawai'i can be challenging. Renewable EnerGIS supports the appropriate siting of renewable energy projects in Hawai'i by providing energy resource and physical site information for sites selected by the user. EnerGIS also enables users to search for Hawai'i sites with certain desired attributes and supports project permitting by providing information on site zoning, soil type, and the presence of sensitive or regulated resources. Like the Wizard, EnerGIS supports siting and permitting due diligence for a variety of large infrastructure projects. **From July 1, 2020, to June 30, 2021, there were 7,094 page views to EnerGIS.**

The Hawai'i Brightfields Initiative makes it easy for landowners, developers, community members, and policymakers to assess the renewable energy potential of contaminated sites and other previously developed parcels statewide in support of Hawai'i's clean energy future.

Energy Feedstock Program: HRS Section 141-9 requires HSEO to work with the Hawai'i Department of Agriculture (DOA) on an Energy Feedstock Program, and to report to the Legislature on progress. This section is provided in compliance with the statute.

HSEO maintains cognizance with DOA on this matter. In fiscal year 2021, the major energy feedstock activities in Hawai'i continued to be the production of local biodiesel by Pacific Biodiesel and the continued growing of pongamia trees by Terviva, which is harvesting biofuel feedstock from its trees. Terviva is also looking to expand into pongamia-based plant proteins and cooking oils. Discussions continued regarding crops and wastes that could be directed to the production of jet fuel and marine fuels, and interest in forest biomass, soil carbon, and carbon sequestration that could result in projects or systems with energy-producing biomass components.

The only biodiesel producer in the state, Pacific Biodiesel, uses a combination of waste cooking oils, recovered oils from grease traps, and oils from sustainable agriculture throughout Hawai'i. Pacific Biodiesel strives for 100% local feedstock to support its annual production of 5.5 million gallons of premium distilled biodiesel refined on Hawai'i Island. In 2021, the primary agriculture crop was sunflower seeds, which are grown and harvested in central Maui and shipped to the company's crushing mill in Kea'au, Hawai'i Island. Other crops planted included cow peas (future swine feed opportunity), sunn hemp (*Crotalaria juncea*), rye, buckwheat, and clover. According to Pacific Biodiesel, plantings for the 2021 harvest season continued year-round with regenerative farming practices including efficient pivot irrigation, no till practices and rotational cover cropping to help sequester carbon and improve soil health. No herbicides or pesticides have been used on any of the crops. All farm equipment and electrical power operates on 100% biodiesel produced by Pacific Biodiesel.

In 2021, Pacific Biodiesel received U.S. Department of Agriculture grant funding to produce a series of innovative mobile biodiesel fueling stations to help expand availability of its 100% biodiesel to serve customers statewide. In August 2021, the Hawai'i Board of Land and Natural Resources approved a revocable permit for Pacific Biodiesel to install a mobile biodiesel fueling station at Ma'alaea Harbor on Maui. The station can serve on-road vehicles and marine customers including tour boats.

Renewable natural gas is being produced by Hawai'i Gas at its renewable natural gas facility using methane from the City and County of Honolulu's Honouliuli wastewater treatment plant. In May 2021, the Hawai'i Natural Energy Institute published a new report, "Resources

for Renewable Natural Gas Production in Hawai'i," which explores the production resources for RNG in Hawai'i. HNEI is also working on three other alternative fuels projects: Novel Biocarbons, Fuel Characterization by Multidimensional Gas Chromatography, and Sustainable Aviation Fuel Production.

Feedstocks for sustainable aviation fuels are being investigated by the University of Hawai'i, a member of the Federal Aviation Administration's Aviation Sustainability Center. Feedstocks under consideration include agricultural and forestry feedstocks as well as urban waste streams.

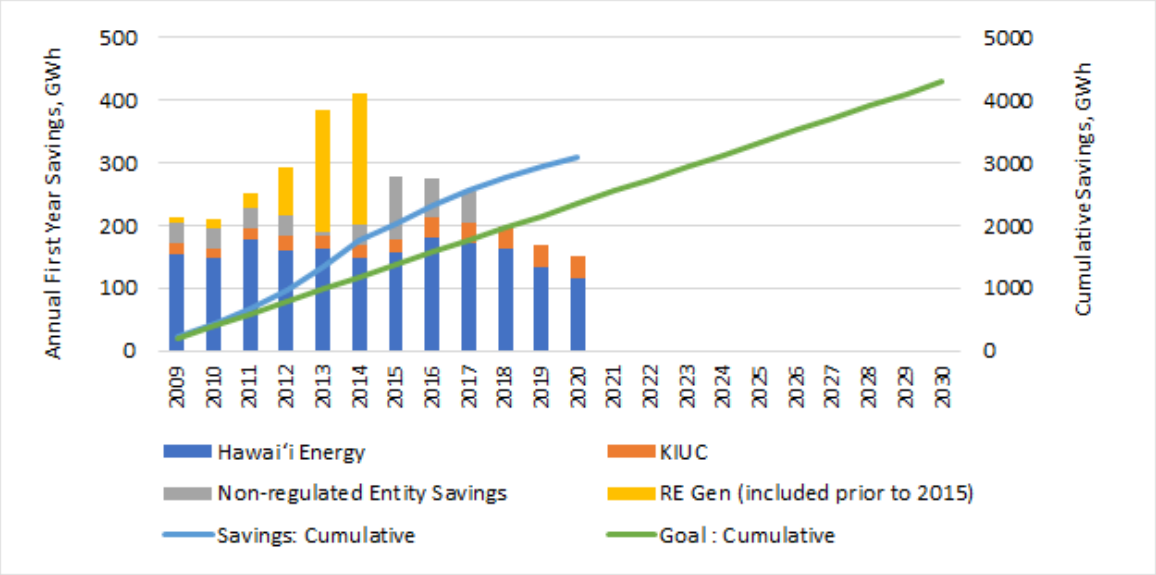
Energy Efficiency

It is often cheaper and more resource-efficient to avoid using a kilowatt-hour (kWh) than it is to generate or purchase a kWh. Each dollar spent on efficiency generally saves ten times that amount on energy bills. **The Hawai'i energy savings multiplier for program year 2020 was eleven to one.**

Energy efficiency is also important as a means of reducing the overall amount of land and resources necessary for meeting Hawai'i's energy needs.

Energy Efficiency Portfolio Standards: Hawai'i's Energy Efficiency Portfolio Standard (EEPS), contained in HRS Section 269-96, requires the reduction of electricity consumption in Hawai'i by 4,300 gigawatt-hours by 2030. To fund the energy efficiency program, a Public Benefits Fee surcharge is collected via utility customers' electricity bills. The EEPS goals and accomplishments to date are shown in the figure on the following page.

Figure 4 - Hawaii's Energy Efficiency Portfolio Standard (EEPS) Energy Savings and Goals, 2009-2030



As this program is important to Hawai'i meeting its energy goals, HSEO provides information on the EEPS in its briefings, presentations, and reports, and works closely with the PUC's consultant overseeing the public benefits fee administrator, named Hawai'i Energy, in technical reviews, comments, and discussions. Fiscal year 2021 activities included:

- HSEO participated in the 2021 EEPS Technical Advisory Group and Technical Working Group meetings to ensure that the state is on track to meet its EEPS goal of 4,300 GWh reduction by 2030.
- HSEO staff reviewed and provided input on efficiency and grid-interactive measures to Hawai'i Energy's PY21 Technical Reference Manual and PUC's Market Potential Study.
- HSEO works in coordination with Hawai'i Energy in providing education, outreach, technical assistance, training for professionals, information for students, and referring the public to Hawai'i Energy for information on rebates when appropriate.
- HSEO participates as a state partner in the Grid-interactive Efficient Buildings Pilot and Public Buildings Working Groups of the National Association of State Energy Officials and the National Association of Regulatory Utility Commissioners (NASEO-NARUC), along with the PUC, Hawaiian Electric, Kaua'i Island Utility Cooperative and Hawai'i Energy, to facilitate effective technical assistance, policy, projects, and communication between states and national laboratories and within state agencies, organizations, and utilities.

Energy Code: Improving energy-efficient building codes and efficiency standards are recognized as cost-effective measures that establish minimum energy performance standards for commercial, residential, and other buildings in Hawai'i. Hawai'i's energy policy is focused on maximizing cost-effective investments and fostering high-impact programs.

HSEO is an ex-officio member, and one staff member serves as the elected chair of the Hawai'i State Building Code Council (SBCC). Established in 2007, the SBCC convenes the Building Code Managers of Hawai'i's four counties and representatives from the major associations representing building-related trades and professions. The mission of the SBCC is to unify, to the extent practicable, state and county building codes. The SBCC adopted the 2018 iteration with Hawaii amendments of the International Energy Conservation Code (IECC), International Building Code, the International Residential Code, the Uniform Plumbing Code and Existing Building Code to synchronize all facets of home and building construction and improve health and safety in addition to energy efficiency.

The HSEO sits on technical and educational committees of the Cool Roof Rating Council, The Urban Heat Island Index project, the Illuminating Engineering Society, and the International Code Council to maximize cost-effective, high-impact efficiency measures nationwide. In support of the SBCC and energy codes, HSEO:

- Provided training and outreach to educate engineering, design, and construction professionals on state and county amendments adopted in 2020 to the 2015 IECC. A total of 498 building professionals attended two webinars held in May 2021. Seven SBCC meetings were held during the reporting period, reaching 210 professionals. Four IECC-related webinars and meetings were held reaching a total of 330 participants, bringing the total number trained to 1038.
- Participated in Hawai'i Energy's quarterly Energy Efficient Codes Coordination committee meetings on energy code and appliance efficiency standards, as Hawai'i Energy adjusted rebates and incentives.
- Hosted bi-monthly "Code Green" episodes on ThinkTech Hawaii, featuring codes and standards updates, as well as new energy and green technologies, projects, and programs.

State Appliance Standards: In addition to energy codes, appliance efficiency standards are among the most effective policies to save consumers energy and money and move Hawai'i closer to decarbonization. HRS Section 196-84 and Section 196-85 specify the following standards, that took effect on January 1, 2021:

- Computers and computer monitors shall meet the requirements set forth in California Code of Regulations, Title 2- Section 1605.3 as amended;
- Faucets shall meet the minimum efficiency standards set forth in California Code of Regulations, Title 20, Section 1605.1, as amended;
- High color rendering index fluorescent lamps shall meet the minimum efficiency requirements contained in Section 430.32(n) (4) of Title 10 of the Code of Federal Regulations as in effect on January 3, 2017;
- Showerheads shall meet the minimum efficiency standards set forth in California Code of Regulations, Title 20, Section 1605.1, as amended; and
- Spray sprinkler bodies that are not specifically excluded from the scope of the Environmental Protection Agency's WaterSense Specification for Spray Sprinkler Bodies, Version 1.0, shall include an integral pressure regulator and shall meet the water efficiency standards.

Hawai'i joined other states, such as California and Washington, to expand the number of appliances covered by appliance efficiency standards. Hawai'i continues to work with the Appliance Standards Awareness Project (ASAP), a non-profit organization dedicated to improving appliance efficiency standards nationwide to identify additional appliances to add to Hawai'i's appliance standards list.

HSEO also works with Hawai'i Energy and other stakeholders to develop and disseminate information on the new appliance standards that have been added to the HSEO website: https://energy.hawaii.gov/appliance-standards.

HSEO has identified partners and a strategic energy management approach to assisting state agencies to decrease energy usage. **State agencies have achieved a 20.1% decrease in energy usage.**

Figure 5 - State Agencies' Electricity Consumption, 2005-2020

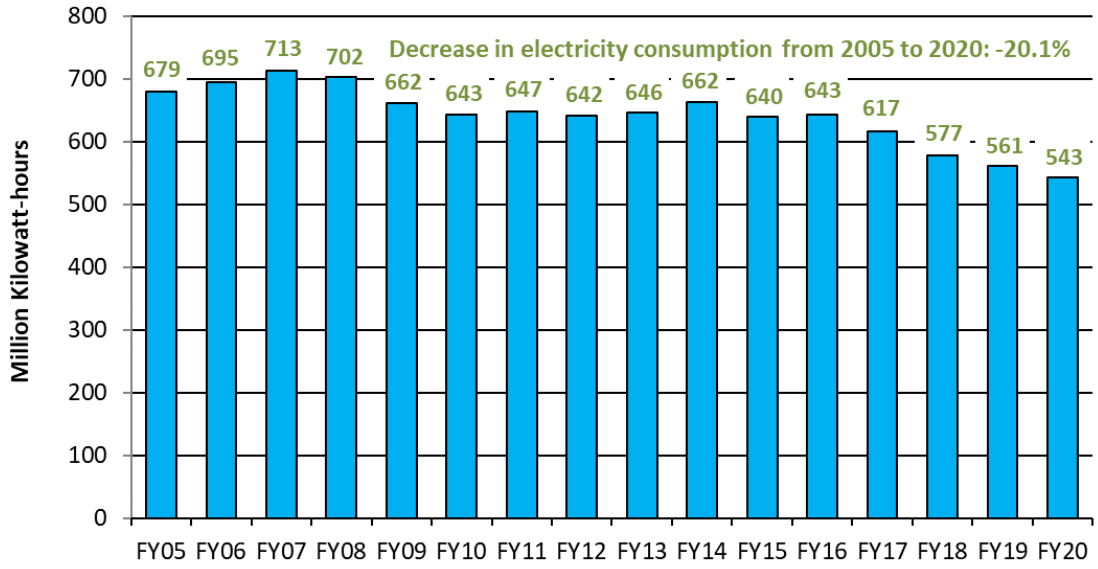
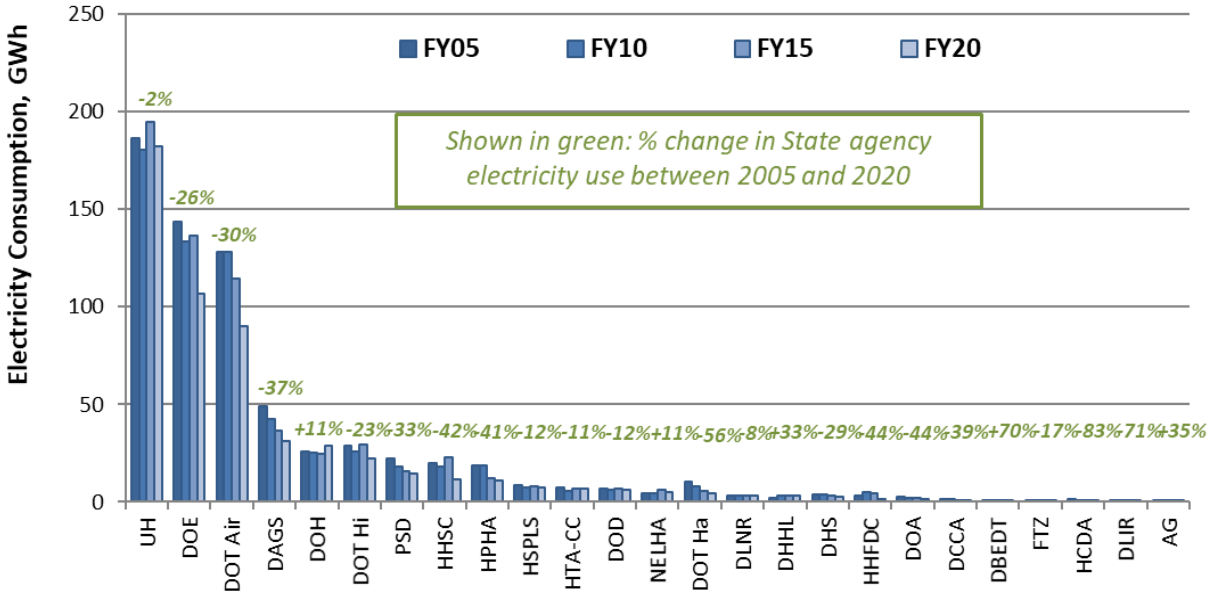


Figure 6 - GWh Consumption by Agency in 2005, 2010, 2015, and 2020; Percent change from 2005 to 2020



AG	Department of the Attorney General
DAGS	Department of Accounting and General Services
DBEDT	Department of Business, Economic Development & Tourism
DCCA	Department of Commerce and Consumer Affairs
DHHL	Department of Hawaiian Home Lands
DHS	Department of Human Services
DLIR	Department of Labor and Industrial Relations
DLNR	Department of Land and Natural Resources
DOA	Department of Agriculture
DOD	Department of Defense
DOE	Department of Education
DOH	Department of Health
DOT Air	Department of Transportation/Airports Division
DOT Ha	Department of Transportation/Harbors Division
DOT Hi	Department of Transportation/Highways Division
FTZ	Foreign-Trade Zone Division
HCDA	Hawai'i Community Development Authority
HHFDC	Hawai'i Housing Finance & Development Corporation
HHSC	Hawai'i Health Systems Corporation
HPHA	Hawai'i Public Housing Authority
HSPLS	Hawai'i State Public Library System
HTA-CC	Hawai'i Tourism Authority—Convention Center
NELHA	Natural Energy Laboratory of Hawai'i Authority
PSD	Department of Public Safety
UH	University of Hawai'i

HSEO provides information, technical review, and collaboration with government agencies, professional associations, and educational institutions in Hawai'i to reduce energy use and to participate in performance contracting. In addition to in-house expertise, HSEO has contracted with technical and contracting experts to provide in-depth review and analysis services. HSEO's FY21 activities included:

Technical Assistance for Energy Performance Contracting: HSEO gave a presentation to state agencies regarding technical assistance that is available for Energy Performance Contracts and other energy efficiency projects.

Technical Review: HSEO reviewed and provided input to the Department of Transportation (DOT)-Harbors and DOT-Highways on Measurement & Verification Reports provided to them by their contractor.

Financing for Energy Efficiency: HSEO organized a webinar for state agencies that provided information on various financing mechanisms that are available for energy efficiency projects.

United States Department of Energy's Sustainable Corrections Infrastructure Partnership (SCIP) Accelerator: HSEO is supporting the Department of Public Safety in this accelerator, which is a three-year USOE initiative to help state public correctional facilities to create a pathway toward a sustainable corrections infrastructure through solutions that address energy efficiency, water efficiency, renewable energy, sustainable transportation, and storage investments that will reduce operating and maintenance costs in public correctional facilities while maintaining their sector priorities of security and resilience.

ENERGY STAR® certification: HSEO assisted the Hawai'i Department of Education (DOE) to apply for ENERGY STAR certification for the Kaimukī Middle School by performing site inspection and working with DOE and a consultant that provided data entry into ENERGY STAR Portfolio Manager, verification of results, and successful submission of the application to ENERGY STAR to achieve certification.
HRS section 196-30 establishes guidelines for benchmarking, retro-commissioning, and energy savings performance contracts for public buildings. These are all effective ways to achieve greater levels of energy efficiency for State of Hawai'i facilities and programs.

Collaborating with other states, community colleges, and state and county building professionals in Hawai'i will increase: 1) Participant knowledge of advanced design and construction practices among instructors and students in community college trade and continuing education programs; and 2) Awareness of employment opportunities in code official and code verification professions.
In FY21, HSEO:

- Adjusted the original budget and scope of work;
- Met to agree on the program goals, objectives, outcomes, and milestones;
- Met with the Smart Energy Design Assistance Center (SEDAC) to bring together community college administrators, code officials, trade unions, the energy

efficiency industry and design and constructions professionals to collaborate on workforce development opportunities relating to the scope of work; and

- Actively participated in the "Community College Energy Code Training Needs Assessment" to develop, review, and test various curricula to be used in community colleges in Hawaii.

Hawai'i Green Business Program

HSEO co-coordinates the Hawai'i Green Business Program (HGBP), which helps businesses implement energy and resource-efficient practices and recognizes their success by communicating the environmental and financial value of their green practices during an annual award ceremony. Now in its 18th year, the Hawai'i Green Business Program was established as a partnership between HSEO, the Hawai'i Department of Health, the Honolulu Board of Water Supply, and the Hawai'i Lodging and Tourism Association. HSEO's FY 2021 activities included:

Cross-Collaboration: Collaborating with Hawai'i Department of Health, Honolulu Board of Water Supply, Hawai'i Energy, Hawai'i Lodging and Tourism Association's Engineer's Advisory Committee, Hawai'i Visitors and Convention Bureau's Sustainability Committee, and the discussion of future collaboration with others.

Spring Green Hotel Forum: Hosting the 2021 Spring Green Hotel Forum, featuring 2020 Hawai'i Green Business Program awardees and their properties' energy and water saving, recycling and renewable energy projects and efforts.

Student Involvement: Working with two student interns to provide virtual work experience and practicum credit while students provided options on how to create a virtual award ceremony with the Governor presiding and a video and online presentation that are available for public viewing.

Hawai'i Green Business Program Awards: Leading the Hawai'i Green Business Program that recognized 20 businesses and events for their commitment to green practices and savings in energy, water, and waste at the annual HGBP award ceremony in December 2020.

Technical Assistance: Recruiting and providing technical assistance to over 20 prospective businesses to participate in a virtual recognition ceremony held in December 2020. The 20 businesses, including major hotels, venues, and events that participated in the 2019-2020

HGBP cohort, achieved significant results, including: the reduction of 19,000 pounds of solid waste, 15,000 therms of liquid propane gas, 1.1 million kilowatt hours of electricity, and 91.6 million gallons of water.

Information: Posting fact sheets and videos on the HGBP website to promote best management practices and participation in the program by new businesses, organizations, and events.

Collaboration with Partners

Hawai'i learns from, and contributes to, national and local organizations of experts in energy efficiency technologies, building codes and standards, and government operations and procurement. This allows HSEO to effectively collect information, assess feasibility, and share best practices, which informs, validates, increases success, and promotes implementation of energy programs and projects at all levels.

Activities in this area in fiscal year 2021 included:

Multi-State Project: Hawai'i joined a federally-funded multi-state collaborative project with Illinois and Nevada energy offices for the development of a Community College Energy Code Training Program with the University of Illinois' Smart Energy Design Assistance Center (SEDAC). In FY21, HSEO met to agree on the program goals, objectives, outcomes, and milestones; met with SEDAC to bring together community college administrators, code officials, trade unions, the energy efficiency industry and design and construction professionals to collaborate on workforce development opportunities relating to the scope of work; and actively participated in the "Community College Energy Code Training Needs Assessment" to develop, review, and test various curricula.

Hawai'i Build and Buy Green: HSEO collaborated with the U.S. Green Building Council Hawai'i Chapter, Hawai'i Energy, and the US Department of Housing and Urban Development to plan and execute the Fall 2021 Hawai'i Build and Buy Green Virtual event.

Resilient Community Hub: HSEO participated in a working group, in collaboration with representatives from U.S. Housing and Urban Development, Hawai'i Department of Education, Kapi'olani Community College, and the City and County of Honolulu's Resilience Office, to develop a proposal to submit to the Hawai'i Emergency Management Agency in support of a pre-disaster mitigation resilient infrastructure project at Kaimukī Middle School. Similar resilient community hub discussions are ongoing.

Clean Transportation

Decarbonizing the transportation sector is central to achieving the State's commitment to achieving a clean energy economy no later than 2045. In 2017, emissions from transportation activities were 8.98 million metric tons CO2 equivalent, accounting for 51% of energy sector emissions. Ground transportation accounted for 47% of those transportation emissions.

HSEO has prioritized efforts that support a transformational investment in Hawai'i's clean energy economy such as: leading by example through the electrification of government fleet vehicles, providing market signals, developing innovative market offerings, and supporting the buildout of backbone infrastructure. Whenever possible, HSEO seeks opportunities to leverage its current funding sources with others from outside Hawai'i to maximize the impact of clean transportation efforts.

The availability of zero-emission vehicles (ZEVs) for purchase and the accessibility of charging stations are significant factors for the advancement of clean ground transportation. HSEO has pursued opportunities to send market signals to vehicle manufacturers and lessors to increase the availability of ZEVs for purchase and rent throughout the state. The light-duty (passenger) vehicle market is beginning to see ZEVs priced on par with their gas-powered equivalents, even before taking into consideration any regional subsidies and lower operating costs.

The next major challenge in ground transportation is converting medium- and heavy-duty vehicles to ZEVs. HSEO led the effort for Hawai'i to join with 14 other states and Washington D.C. in signing the Multi-State Zero Emission Medium- and Heavy-Duty Vehicle Memorandum of Understanding (MDHD MOU). The 15 signatory states and Washington D.C. account for almost 50% of the U.S. economy and 40% of goods moved by truck (value) sending a strong market signal for ZEV vehicles in the medium- and heavy-duty segment, including full size pickup trucks.

Supporting the growth of the MDHD ZEV market helps to drive the original equipment manufacturers to develop the models that will be needed in the near- and medium-term to keep on track to achieve state and national decarbonization goals in ground transportation. The signatory states have been collaboratively developing an MDHD ZEV Action Plan, set to be released in 2022. This action plan will discuss opportunities and

barriers to MDHD market transformation and recommend strategies to achieve the goals set forth by the group.

To support this transition, HSEO has allocated $2.5M of VW Settlement funds towards rebates for MDHD transit, shuttle, and school buses, as well as MDHD trucks. This funding is used as a local match for federal Diesel Emission Reduction Act (DERA) funds in partnership with Hawai'i Department of Health (HDOH). This partnership leveraged Volkswagen Settlement funds to receive a bonus incentive of roughly $500,000 from the U.S. Environmental Protection Agency's Diesel Emissions Reduction Act program, increasing the otherwise available funds by more than 30%. These funds will go towards the Diesel Replacement Rebate (DRR), a multi-year program that will offer 45% rebates to public and private organizations within Hawai'i that replace old, medium- and heavy-duty vehicles with an electric equivalent and an associated charger for the initial program cycle. The DRR program will evolve over its life to take into consideration changing market conditions to incorporate technologies such as hydrogen vehicles.

HSEO also partnered with HDOH to use both DERA and VW funds to help the City and County of Honolulu procure a battery electric bus, which has replaced an existing diesel bus, thereby reducing the number of pollutants that residents are exposed to daily.

A robust backbone of electric vehicle (EV) charging infrastructure is critical to the ubiquitous adoption of ZEVs necessary to achieve Hawai'i's energy and decarbonization goals. To that end, HSEO engages in both market building activities and infrastructure deployment supporting the buildout of EV charging infrastructure. HSEO has nominated alternative fuel corridors on Hawai'i island, Maui, Moloka'i, Lāna'i, O'ahu, and Kaua'i. With the designation of alternative fuel corridors, the Federal Highway Administration (FHWA), is establishing a national network of alternative fueling and charging infrastructure along national highway system corridors. Segments of each nomination have been designated either "corridor pending" or "corridor ready" by the FHWA.

In 2020, FHWA Highway Infrastructure Program (HIP) funding was expanded to projects providing "necessary charging infrastructure along corridor ready or corridor pending alternative fuel corridors." Additionally, HSEO has allocated $50,000 towards the deployment of a DC fast charger on Kauai to support the successful application of a future corridor ready designation.

The Infrastructure Investment and Jobs Act (IIJA) also includes programs that make federal funding available to alternative fuel corridors. As part of the Volkswagen Settlement, HSEO has allocated 15%, the maximum authorized percentage, to the deployment of charging infrastructure in HSEO's Beneficiary Mitigation Plan. As Volkswagen Settlement funds are not federal dollars, they may qualify as the required local match for HIP projects, lowering the funding barrier to access HIP funds and maximizing the impact of Volkswagen Settlement funds. HSEO will be reviewing programs under the Infrastructure Investment and Jobs Act as the programs roll out over the coming year. HSEO supports activities that lay a foundation for all consumers to have affordable access to EV charging, as they serve a critical role in the equitable transition of the transportation sector.

Exploring and participating in innovative ways to advance the adoption of ZEVs has positioned HSEO with firsthand expertise to act as a resource to other state agencies as they look to complete their fleet transitions. HSEO is participating in a relatively unique "electric vehicle as a service" contract with DOT, resulting in an electric vehicle that is available for HSEO staff to conduct official state business activities. This vehicle is price-comparable to a fossil fuel powered internal combustion engine vehicle, and costs less to fuel and maintain. Use of the vehicle is charged per mile of use and includes the cost of fuel (electricity) and maintenance of the vehicle.

Stakeholder and Community Education, Outreach, and Engagement

HSEO is prioritizing a more comprehensive public clean energy education, outreach, and engagement program, which is critical to achieving HSEO's broader mission. To fulfill HSEO's mandates, increase living wage jobs, capital investment in energy efficiency and renewable energy projects, access to energy efficiency opportunities, and decarbonize Hawai'i's economy everyone must be included in achieving these goals. The increasing public challenges and vocalized community concerns about energy projects' impacts on host communities has made clear the need for a more intentional effort to reach out to and include grassroots community in HSEO's stakeholder engagements and collaborations to more effectively, efficiently, and equitably advance Hawai'i's clean economy goals.

In 2008, the Hawai'i Clean Energy Initiative (HCEI) was launched in partnership with the U.S. Department of Energy (USDOE) as a separate initiative specifically to engage the federal government and the private sector to help lead efforts to achieve renewable energy and clean transportation goals. From the outset, HSEO and USDOE sought to create a

holistic, locally driven strategy to advance Hawai'i's enterprising clean energy agenda by pooling the ideas, resources, and capabilities of a diverse team of energy focused stakeholders. HCEI succeeded in bringing together industry related business leaders, policymakers, and non-governmental organizations.

Over the past thirteen years, the HCEI has accomplished many of its objectives. The State of Hawai'i, USDOE, and industry leaders acted as co-pilots in creating and advocating for the landmark Initiative that developed strategic private sector partnerships for the research, development, testing, deployment, and permitting of clean and renewable technologies. Today its goals and objectives are fully woven into the fabric of HSEO, which works closely on a day-to-day basis with national, state, county, and private sector energy industry stakeholders to carry out all the mandates pursuant to HRS section 196-10.5 of the HCEI including Hawai'i's potential for near-term project opportunities for the state's renewable energy resources; and initiating electric grid reliability and security projects that will enable the integration of a substantial increase of electricity from renewable-energy resources.

Broadening Stakeholder Outreach

Today, HSEO's priority involves harnessing its strategic private sector partnerships to develop broader, grassroots public participation to move forward together to ensure renewable energy project success; and to ensure all Hawai'i's citizens engage in and benefit from the energy efficiencies needed to reach mandated targets. Industry, government, and community stakeholders have expressed that many of their concerns are not captured fully by the current regulatory process and community members have expressed a lack of knowledge about the energy industry as well as the project planning and regulatory process.

These stakeholders have requested that HSEO, in its capacity as an objective neutral party, convey those concerns and weigh in on energy planning and regulatory processes. They have also asked HSEO to educate the public about energy resources, systems, and project planning, development, and regulatory processes to help resolve issues about existing and planned renewable energy projects. It is clear advancing progress toward a zero-emission economy requires a mutually informed industry, government, and community perspective. More grassroots, inclusive public engagement can help develop a collective clean energy vision that also addresses broader economic development solutions elevating the quality of life for everyone in Hawai'i.

Clean Energy Education

Part of HSEO's broader engagement priority includes a statewide clean energy education and outreach plan developed in coordination with Hawai'i's institutions of public education as was originally mandated by HRS section 196-10.5. HSEO has contracted with the Maui Economic Development Board (MEDB) STEMworks to create curricula for Hawai'i's K-12 students and their teachers.

To date, MEDB STEMworks has tested 38 projects, labs and renewable energy kits and additional online activities to vet all laboratory exercises to be included in the six modules. Every module includes one reading exercise, three hands-on laboratory experiments, one digital extension activity and one do at home activity to increase engagement throughout the community. All of the laboratory exercises are Next Generation Science Standards (NGSS)-aligned. All modules will be completed by January.

MEDB STEMworks is recruiting up to 200 teachers throughout the state to participate with training beginning in early 2022 depending on material availability and scheduling. Teachers will receive a full classroom pack of supplies for immediate implementation in their classrooms and will be awarded a $150 stipend upon full completion of participation. Additional train the trainer sessions will be held at the Hawaii STEM Conference in Spring 2022.

Rebranding and Communications

Also, key to the overall success of HSEO's ongoing mandated activities is enhanced messaging and communications infrastructure. HSEO is working with contractors to develop and implement a strategic communication plan in support of HSEO's mission and Hawai'i's clean energy goals.

With the assistance of Essense Partners, HSEO is refreshing its logo and overhauling its websites and email platforms to improve public outreach and community engagement. The merging of the HCEI and HSEO websites, addition of online community engagement software, and other user-friendly improvements will make it easier for people to access information and stay informed on projects and programs.

DTL, LLC is working on a cultural narrative and Playbook that will be used to inform and guide community and stakeholder outreach and engagement across the state. Together these programs will incorporate community insight to improve how HSEO works with and

proactively engages with communities about renewable energy, clean energy goals, and energy efficiency.

VISTA-AmeriCorps

As Hawai'i moves toward its 2045 goal of 100 percent clean energy, HSEO recognizes the need for a more equitable approach to decarbonizing the economy. Beginning in 2021, HSEO brought board three AmeriCorps VISTA members to reach out to vulnerable and underserved communities to help them lower their energy costs, decrease the potential negative impacts of the energy transition, and improve the benefits of clean energy projects that can provide higher wage, short and long-term employment opportunities.

The VISTA members played a key role in helping HSEO build equity into its policies and programs to ensure "no one is left behind" in the transition to a zero-emission economy. The three VISTA members focused on clean energy and clean transportation affordability, and community engagement and communications respectively, and helped develop and implement strategies for education and outreach to vulnerable, under-represented, and asset limited, income constrained, employed (ALICE) community partners through the new Clean Energy Wayfinders (Wayfinders) program to improve access to fundamental resources including reliable, affordable clean electricity and clean transportation options and employment opportunities.

During the program's pilot year, the Community Engagement and Communications Specialist helped HSEO to develop targeted outreach initiatives that better engage vulnerable communities in energy project decision-making and improve their access to energy conservation and clean energy resources through HSEO's social media platforms.

The Energy Affordability Specialist assisted the office with projects involving energy efficiency, renewable energy, clean transportation, and public education to help Hawai'i achieve a resilient clean energy economy, with projects that include representing HSEO in the Energy Equity Hui, building a list of all the financial assistance resources available to low- and moderate-income (LMI) residents across Hawai'i that help lower household energy utility bills, and supporting HSEO to develop the Wayfinders program concept.

The Transportation Affordability Specialist supported HSEO's efforts to improve affordable clean transportation options for Hawai'i's low-income and vulnerable communities by managing and representing HSEO in the Transportation Equity Hui, an interdepartmental collaboration to prioritize the transition to safe and clean transportation, assisting HSEO

staff to support the development of multimodal mobility hubs for equitable and resilient community hubs for disaster preparedness and response, and supporting the development of the Wayfinders program concept.

As HSEO gets to know its new Year 2 HSEO VISTAs that began working the same day the first cohort departed on December 6, 2021, the office is thrilled to have helped each Year 1 VISTA secure continued full-time employment within Hawai'i's clean energy sector.

Wayfinders Program

Through the expanded capacity provided by the VISTA members, HSEO has developed the conceptual Clean Energy Wayfinders program. The Wayfinders program mission, in partnership with Hawai'i energy industry and community stakeholders, is to advance Hawai'i's clean energy goals and create jobs for a new generation of clean energy leaders while addressing inequities in vulnerable communities. Increasing vocalized community concerns about energy projects' benefits and impacts on host communities have made it clear that a deliberate, more intentional, and inclusive effort is needed to support Hawai'i's clean energy transition.

The Wayfinders program members will share the benefits of energy conservation and clean energy adoption with Hawai'i's schools, community organizations, and households, especially those in low-to-moderate income and under-resourced communities, to help increase energy conservation and efficiencies, lower monthly energy utility bills, increase access to clean transportation and renewable energy resources, and promote green career training and employment opportunities.

With recruiting focused in targeted priority communities, the Wayfinders will receive energy and community outreach and engagement training to effectively provide their communities with energy conservation, efficiency, clean energy, and clean transportation information, and to facilitate community organizations and households access to programs and resources, including federal Low Income Home Energy Assistance Program (LIHEAP) and Weatherization Assistance Program (WAP) funds, statewide Solarize initiatives, and community-based renewable energy (CBRE) subscriptions.

By helping to build community understanding and awareness through increased access to information and resources, Wayfinders will provide additional means for community voices to be heard by policymakers and project developers to more effectively collaborate and guide decision-making. Wayfinders will also participate in workforce development

opportunities with program and industry partners to promote living-wage green careers in Hawai'i.

The inaugural cohort will begin in early 2022 through the Kupu 'Āina Corps program, part of the year-long Green Jobs Youth Corp made possible with federal funding through the American Rescue Plan Act and approved by the governor and Hawai'i Legislature in Act 181 Session Laws of Hawai'i 2021.

Data Analytics

HSEO has begun the work of establishing and implementing an energy ecosystem data governance framework. As a necessary preliminary activity to downstream data governance efforts, HSEO has conducted an in-house data inventory survey to develop and maintain a base level of situational awareness of the office's consumption, utilization, and curation of data. The results of this survey culminated in a data catalog comprising 80 datasets, spanning a multitude of public, private, and non-profit sources, including but not limited to: Hawaiian Electric, the U.S. Energy Information Administration, the Hawai'i Public Utilities Commission, the U.S. Environmental Protection Agency, DBEDT's Research and Economic Analysis Division, the City and County of Honolulu, and the American Council for an Energy Efficient Economy. These results highlight the scale and diversity of data that the office leverages on a regular basis, providing HSEO with an operating picture on which to base the policy, strategic, architectural, and technical requirements of its forthcoming data governance framework and associated secure data platform.

Accessible, reliable, high quality data undergirds nearly all efforts to achieve a resilient clean energy decarbonized economy. Data supports the development of equitable and economically viable energy efficiency programs. Data are used to monitor and track progress towards state energy and climate goals, as well as objectives such as the conversion of medium- and heavy-duty vehicles to ZEVs. Reliable data are also necessary to identify and evaluate the risks and vulnerabilities of Hawai'i's energy supply chain for emergency response and regulatory proceedings. Data are ultimately what supports the identification of the highest impact activities that the state can pursue to maximize both public and private sector spending in the transition to a carbon free economy. Having a well-developed data governance framework will enable innovation and new business opportunities by creating a foundation of high-quality data to support information sharing, machine learning, and artificial intelligence. The jobs of the future will also increasingly rely on the ability to process, analyze, and apply data analytics.

"Engage" is one innovative data analytics project for which HSEO is a recognized national leader. Engage is an open access, publicly available web application for energy system modeling. HSEO developed Engage, previously known as Hawai'i Energy Visualization Initiative or HEVI, in collaboration with the USDOE's National Renewable Energy Laboratory (NREL). Engage augments the energy system planning process by empowering more stakeholders to better understand and solve energy system planning problems. It can be used to explore decarbonization strategies such as 100 percent electrification of ground transportation as well as progress in aviation and marine transportation sectors.

The scenarios can provide estimates of the impact on the demand for renewable energy deployment which can be visualized in tools such as the Hawai'i Advanced Visualization Energy Nexus (HAVEN), which can be utilized for community engagement. These electrification scenarios can be weighed against other decarbonizing transportation opportunities such as efficiencies in mobility from multi-modal transportation, reduction in vehicle miles traveled, and increased utilization of mass transit. Understanding the tradeoffs of both community impacts and implementation costs associated with various tactics can promote an open and transparent dialogue to support Hawai'i's transition to a net-negative emissions economy. Activity in fiscal year 2020 was limited due to COVID-19 and hiring restrictions; however, HSEO is working with the USDOE and NREL on a scope of work for the coming year and HSEO is working with the University of Hawai'i Data Science Institute for up to three Data Science Fellows to help run scenarios while gaining professional development experience.

HAVEN is an HSEO-developed tool that supports the analysis and communication of information contained within complex energy data sets highlighting energy and related sector interdependencies and scenarios. HAVEN will be updated in FY22 and continue to be utilized in community engagements to advance the discussion on the tradeoffs of alternative renewable energy buildout pathways, and how they impact land utilization.

HAWAII STATE Energy Office

PART 2 Ongoing Mandated Activities

This part describes HSEO's ongoing activities in response to the directives established pursuant to HRS 196-71 and 72, and other applicable statutes that support the overall advancement of Hawaii's clean economy goals. As specifically set forth in Act 122, HSEO shall:

(1) Provide analysis and planning to actively develop and inform policies to achieve energy efficiency, renewable energy, energy resiliency, and clean transportation goals with the legislature, public utilities commission, state agencies, and other relevant stakeholders;

(2) Lead efforts to incorporate energy efficiency, renewable energy, energy resiliency, and clean transportation to reduce costs and achieve clean energy goals across all public facilities;

(3) Provide renewable energy, energy efficiency, energy resiliency, and clean transportation project deployment facilitation to assist private sector project completion when aligned with state energy goals; and

(4) Engage the private sector to help lead efforts to achieve renewable energy and clean transportation goals through the Hawaii clean energy initiative.

Part 2 sets forth these activities in fiscal year 2021 (FY21) to demonstrate the integrated, holistic approach HSEO brings to achieve these critical goals within the context of HSEO's overall purpose "to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient clean energy economy."

Promoting Energy Efficiency

Solar Water Heater Variance Program

By State law, Hawai'i Revised Statutes (HRS) Section 196-6.5, every single-family dwelling built after January 1, 2010 must have a solar water heater that meets specifications established by the PUC in Docket No. 2008-0249. As part of the law, HSEO administers the Solar Water Heater Variance (SWHV) Program. HSEO maintains a Solar Water Heater Variance website and forms; provides information, in coordination with county building and permitting departments, to private sector architects, engineers, and homeowners; and accepts and processes the variance requests.

HSEO also coordinates the activities of the SWHV Working Group, which was initiated to review provisions of Hawai'i Administrative Rules Title 15, Chapter 37 and the final judgement of Hawai'i Circuit Court Judge Jeffrey Crabtree in Hawai'i Solar Energy Association and Sierra Club v. DBEDT, Civil No. 18-1398-09 (JPC), April 29, 2019, which stated in part, "It is the intent of the legislature that the variances provided for in Act 204, Session Laws of Hawai'i 2008 will be rarely, if ever, exercised or granted because the burden of proof will lie within the applicant to demonstrate that a solar water heater system, regardless of location or circumstance, is not cost effective in the context of a 30-year mortgage term." In the reporting period, the Solar Water Heater Variance Working Group met to discuss updating the Life Cycle Cost Comparison form, calculations, instructions, notes, and definitions. The updated workbook was circulated to the Working Group for their review and input. The Working Group approved the updated workbook in February 2021, and it has been in use since March 2021. The updated workbook allows the use of gas-tankless instantaneous water heaters that have been certified by a nationally recognized testing laboratory.

During the COVID-19 pandemic, the Governor through emergency proclamation suspended in-person or paper SWHV submittals and required all applications to be submitted electronically via HSEO's online application.

Promoting Renewable Energy

Renewable Fuels Production Tax Credit

The Renewable Fuels Production Tax Credit (RFPTC) is a tax credit to qualifying taxpayers who produce and sell a minimum quantity of 2.5 billion British thermal units of renewable fuels over a calendar year. Per HRS Section 235-110.31, the 2021 tax year is the last year that the credit will be available to pre-qualified producers. In fiscal year 2021, HSEO collected the forms and issued the certificates required by HRS section 235-110.31. In compliance with the statute, HSEO reports the following:

1. The number of renewable fuels production facilities in the state and outside the state that have claimed the RFPTC for calendar year 2020: Three facilities.
2. The location of renewable fuels production facilities in the state and outside the state that have claimed the RFPTC for calendar year 2020:

    - Facility 1: 16-240 Mikahala Street, Kea'au, HI 96749
    - Facility 2: 91-390 Kauhi Street, Kapolei, HI 96707
    - Facility 3: 91-1000 Geiger Rd, 'Ewa Beach, HI 96707

Table 1 - The total amount of renewable fuel by type, in British thermal units (Btu), produced and sold in calendar year 2020

Facility	Type of Fuel	2020 Amount Produced (Btu)	2020 Amount Sold (Btu)	2021 Projected Production (Btu)
Facility 1	Biodiesel	700,542,915,600	558,488,327,310	687,500,000,000
Facility 2	Hydrogen	30,419,407,838	30,419,407,838	41,500,000,000
Facility 3	Renewable Natural Gas	37,988,126,070	37,988,126,070	70,000,000,000

Energy Systems and Technology Training Courses for County Officers and Employees

Act 145, Session Laws of Hawai'i 2019, directed the creation of "energy systems and technology training courses for county officers and employees" and provided funding for the initiative through HSEO. As directed by the legislation, HSEO provided funding to the University of Hawai'i Community Colleges (UHCC). During the performance period, which ended on May 31, 2021, UHCC held 20 training sessions that attracted over 260 participants.

Promoting Clean Transportation

The state's commitment to meeting a zero emissions clean economy by 2045 is aimed to mitigate greenhouse gas emissions by both reducing and sequestering atmospheric carbon and greenhouse gases produced within the state. The clean economy target is supportive of the state's commitment to the Paris Agreement, and, of specific relevance to the transportation sector, HRS section 226-18(a)(2), which pursues "the ultimate elimination of Hawai'i's dependence on imported fuels for electrical generation and ground transportation." As noted in Part 1, energy for transportation makes up most emissions and must be broadly addressed for Hawai'i to achieve its goals. The Hawai'i Clean Energy Initiative Transportation Energy Analysis, commonly referred to as the ICCT report, developed a master list of nearly 100 potential tactics that could contribute to reduced petroleum consumption across ground, aviation, and marine transportation sectors from which a short list of 38 tactics were identified.

Most of the then economically viable tactics were in the ground transportation sector which is where HSEO has focused much of its current activities. Reducing VMT is a strategy that is identified by the report as having some of the greatest potential economically viable petroleum reduction tactics. Material progress towards the elimination of fossil fuels in

ground transportation will greatly reduce the total volume of local carbon sequestration projects that would need to be sited and funded to achieve the 2045 clean economy target.

There have been promising developments which provide optimism for deeper decarbonization of the marine and aviation transportation sectors in the future. On November 22, 2020 Ampaire Inc. flew a hybrid electric plane, the Electric EEL, round trip between Maui's Kahului Airport to Hana. According to Ampaire this is the first demonstration of a hybrid-electric aircraft along an actual airline route which Ampaire is flying regularly as a demonstration through a partnership with Mokulele Airlines.

HSEO has taken a leadership role in advancing the adoption of clean transportation across Hawai'i, including facilitating ZEV deployment and associated electric vehicle charging and hydrogen infrastructure, which directly contribute to reducing petroleum consumption and emissions in the transportation sector. To transition to a decarbonized transportation sector, HSEO works with the local community; federal, state, and county agencies; energy stakeholders; and clean transportation stakeholders to encourage and facilitate the adoption of clean transportation.

VW Settlement

Light Duty Zero Emission Vehicle Supply Equipment: In accordance with the Volkswagen Settlement Environmental Mitigation Trust, the State of Hawai'i, as a Beneficiary of the Trust, will use 15 percent of its total allocation of trust funds on eligible costs for Light Duty Zero Emission Vehicle Supply Equipment (Eligible Mitigation Action #9). Per Hawai'i's Beneficiary Mitigation Plan (Section 6.3.2), HSEO submitted a funding request to allocate $1,218,750 of Trust funds to contribute towards the purchase, installation, and maintenance of light duty electric vehicle (EV) charging stations, which may include a mix of Level 2 chargers and DC fast chargers. The program will focus on locations (1) available to the public at government owned properties, (2) available at workplaces or (3) that support charging network connectivity. The EV charging stations will help to expand Hawai'i's statewide EV charging network and support the state's fleet electrification efforts. HSEO has allocated $50,000 towards a public DC fast charger on Kauai, which currently has no publicly accessible DC fast charger.

Diesel Replacement Rebate (formerly Vehicle Assistance Program): HSEO signed a Memorandum of Agreement with Hawai'i Department of Health (HDOH) for the development and administration of the Diesel Replacement Rebate (DRR) to offer rebates

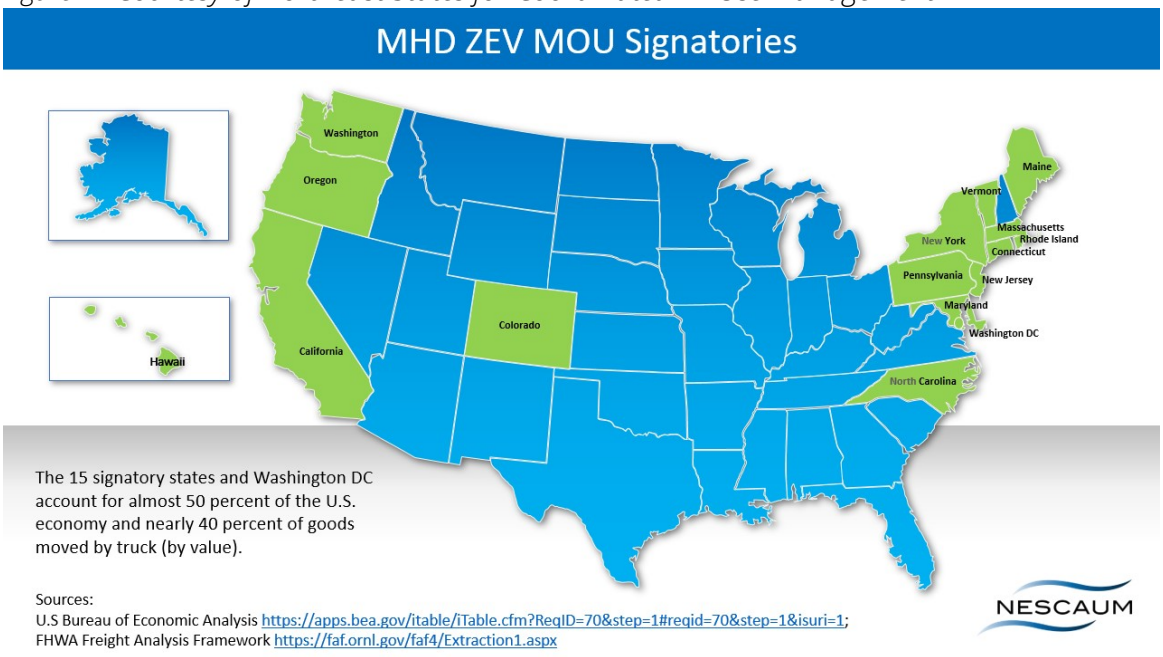
to private and public fleet owners looking to replace older, diesel buses with battery-electric vehicles. HSEO is responsible for the development and administration of the DRR rebate program and HDOH is responsible for the payment of participant support costs to the Diesel Emission Reduction Act (DERA) program beneficiaries for the successful procurement of eligible vehicles through the DRR. The program opened on October 29, 2021 and has received numerous applications.

City and County of Honolulu Transit e-Bus: HSEO is utilizing Volkswagen Trust funds in partnership with the HDOH to leverage DERA funds to assist with the procurement of a 35 ft. battery electric bus and charging equipment for the City and County of Honolulu, Department of Transit Services and Oʻahu Transit Services. The City and County of Honolulu issued the RFP in fiscal year 2020 and awarded the contract in July 2020. The Vehicle was delivered in 2021 and is replacing an existing diesel bus, thereby reducing the pollutants that residents are exposed to daily.

Hawaiʻi Zero Emission Bus Program: The HSEO is continuing to work with the State of HDOT, the County of Kauaʻi , the County of Maui, and the County of Hawaiʻi on a program to replace up to 12 MHD diesel buses with battery-electric zero-emission equivalents buses. HSEO working in collaboration with the partners are leveraging Volkswagen Settlement funds with Federal Transit Administration (hereinafter called “FTA”) Low-No grant applications proposing to replace aging diesel transit buses that are beyond their useful life, with battery electric transit buses with supporting charging infrastructure. DOT has the ability to distribute FTA formula funds from FY 19, 20, & 21 as well as Low-No grants from 2018 and 2021 towards projects that replace diesel buses with electric buses.

Collaboration with Partners: HSEO coordinated Hawaiʻi’s participation in the Multi-State Zero Emission Medium- and Heavy-Duty Vehicle Memorandum of Understanding (MDHD MOU) along with 14 other states and the District of Columbia. The MDHD MOU commits signatories to work together to foster a self-sustaining market for zero emission medium- and heavy-duty vehicles. The Signatory States agree to strive to make sales of all new medium- and heavy-duty vehicles in their jurisdictions zero emission vehicles by no later than 2050.

Figure 7 - Courtesy of Northeast States for Coordinated Air Use Management



To ensure adequate progress toward the 2050 goal, the Signatory States will strive to make at least 30 percent of all new medium- and heavy-duty vehicle sales in their jurisdictions zero emission vehicles by no later than 2030. Each Signatory State will report, within its available capabilities and on a schedule agreed to by the states, medium- and heavy-duty vehicle registration data needed to track progress toward meeting these targets.

The need to track progress is one of the activities supported by HSEO's goals to develop an energy data governance framework discussed below. In 2025, the Signatory States agree to assess progress toward meeting the 2030 and 2050 targets and determine whether an adjustment to the 2030 interim sales target is appropriate. The Task Force is currently developing a multi-state action plan to identify barriers and propose solutions to support widespread electrification of medium- and heavy-duty vehicles (Zero Emission Medium- and Heavy-Duty Vehicle Action Plan).

Vehicle Miles Traveled and Active Transportation: Highlighted in the International Council on Clean Transportation's Hawaii Clean Energy Initiative Transportation Energy Analysis, one of the strategies expected to have the greatest impact on energy consumption is to VMT. HSEO and the Department of Land and Natural Resources (DLNR) applied for and was awarded a grant from the Environmental Protection Agency (EPA) to develop a VMT Reduction Toolkit. Work to develop the tool kit occurred this year, with final recommendations expected in the first quarter of 2022.

To implement this toolkit, HSEO and DLNR applied for and was awarded a grant from the U.S. Climate Alliance to hire a VMT and Active Transportation Specialist. The role was filled in December 2021. Throughout the two years of the grant-funded position, this person will focus on the development and implementation of strategies to reduce VMT in the State of Hawai'i through mode-shift, active transportation, and other associated means.

Specifically, this role will manage and implement VMT strategies recommended in the EPA funded VMT Reduction Toolkit. This person will be collaborating with relevant HSEO, State Climate Commission staff, and State agencies to integrate those recommendations and best practices into the State's operations where appropriate.

Additionally, this position will help to initiate and guide the work in the Multi-modal Mobility Hub proposal, funded partially by a grant from the OahuMPO Overall Work Program. This proposal includes developing a plan for assessment of state parking facilities on O'ahu that will allow for multi-modal use. It proposes to identify and describe state parking facilities, including their utilization rates; evaluate and price various ways to make better use of these state assets in ways that encourage the use of alternative transportation and mobility options; and overall, help optimize state and county goals for clean transportation while maximizing the public benefit.

This position will also support the transition of the state's fleet to ZEVs in line with statutory goals and procurement guidelines. Through collaboration with state agencies, this position will help to plan, conduct procurement, integrate ZEV and charging/fueling infrastructure, and facilitate fleet reduction/mode shift. This will include producing communications, informational presentations, educational briefings, and outreach activities.

Achieving a Resilient, Clean Energy, Decarbonized Economy

HSEO has statutory responsibility for resilience and energy assurance and is the primary and coordinating agency for State Emergency Support Function 12: Energy (SESF-12). Under SESF-12, HSEO coordinates and staffs the SERT and Shortage Management Center (SMC) to support energy industry stakeholders including navigating issues responding to events such as hurricanes and COVID-19.

HSEO also has statutory responsibility for maintaining a quantitative and qualitative capacity to support Hawai'i's transition to achieving a resilient, clean energy, and decarbonized economy. Foundational to that capacity is development of an energy data

governance framework to provide quality and accessible data from which HSEO and stakeholders can develop plans and measure progress. From those planning efforts HSEO supports the investment in resilient energy infrastructure to achieve the state's energy policy objectives.

Energy Assurance/Resilience

State Emergency Support Function #12 – Energy

HSEO serves as the lead state agency under HI-EMA to coordinate and respond to all significant energy disruptions impacting Hawai'i. To support this mission HSEO provides technical expertise and support to energy asset owners and operators as well as other state and local government agencies. Support includes assisting government and private sector stakeholders in overcoming inherent challenges associated with restoration of the energy system and maintains situational awareness of the status of energy restoration efforts and other information as appropriate. In addition to the unprecedented impact to Hawai'i's energy supply from COVID-19, HSEO was activated for Hurricane Douglas and prepared diligently for and tracked other potential causes of significant disruption to Hawai'i's energy and fuel supplies.

As part of the response to COVID-19, HSEO worked to keep energy workers safe during the early days of the global pandemic. HSEO proactively worked with emergency management agencies and the energy industry to address ongoing and evolving issues around COVID-19 for critical energy infrastructure workers, specifically:

Energy Workers Best Practice: HSEO developed a national best practice for keeping energy workers safe during the early days of COVID. In its SESF-12 capacity, HSEO proactively worked with stakeholders to address issues supporting critical infrastructure workers in the energy industry. HSEO worked with emergency management agencies and the energy industry to address priority testing of these critical energy infrastructure workers, which was highlighted as a best practice by the National Association of State Energy Officials (NASEO) to the US Department of Energy (USDOE) Office of Cybersecurity, Energy Security, and Emergency Response (CESER) and in their nationwide coordination efforts for COVID-19 response.

State of Hawai'i Vaccination Plan: As part of the planning and implementation of the State of Hawai'i Vaccination Plan, HSEO participates in the Communications, and the Allocation/Prioritization Working Groups to ensure effective and timely information

exchange with energy companies and providing guidance on identification and prioritization of mission- and business-critical energy workers for the COVID-19 vaccine.

Governor's Executive Order requiring visitors to State facilities to provide proof of vaccination or negative COVID test: After the Governor signed this Executive Order, HSEO worked with energy industry stakeholders, HI-EMA, DOT, and the Attorney General to get clarification on its implementation so that energy supplies would not be disrupted by the new rules.

HSEO is also analyzing and assessing the capacity of Hawai'i's energy system to adjust to the rapid near-total collapse and extended recovery of Hawai'i's tourism industry and its effects on energy supply such as jet fuel, diesel, and low-sulfur fuel oil (LSFO) throughout the State.

COVID-19 created a scenario that was largely not considered in prior emergency planning—the demand destruction of jet fuel due to the absence of millions of tourists flying into and out of Hawai'i. As a result, Hawai'i's sole refinery operator renegotiated numerous contracts, including its LSFO contract with state's largest electric utility, which resulted in an interim increase of about $4.50 per month on O'ahu electricity customers' bills.

While the energy supply is currently stable, the possibility that Hawai'i could switch to 100% importation of refined products in response to future demand or supply disruption and the potential impact on fuel supplies and distribution in Hawai'i is a priority investigation for HSEO. As tourism resumes and jet fuel use recovers, HSEO is working to assure Hawai'i's energy supply is resilient to any further potential disruption and still moving forward on Hawai'i's clean energy goals.

FEMA Hazard Mitigation Program Advance Assistance Grant

HSEO was awarded an Advance Assistance grant aligned with the planning for the Interdependencies of Critical Energy Infrastructure (ICE-I) MOU discussed below under Collaboration with Partners. A primary purpose of Advance Assistance application is to provide resources to develop mitigation strategies and obtain data to prioritize, select, and develop comprehensive applications for FEMA's Hazard Mitigation Grant Program (HMGP) Building Resilient Infrastructure and Communities (BRIC) program.

Working with public and private sector stakeholders the project will, among its deliverables, collect data and assess interdependencies between critical energy infrastructure and

community lifeline key customers, develop a geospatial decision support system to visualize these interdependencies and impacts of system losses and centralize useful contextual information supportive of federal hazard mitigation applications, develop State of Hawai'i mitigation strategies, and update/improve identification of mitigation actions in support of the State of Hawai'i Hazard Mitigation Plan and related state- and local-level risk/vulnerability priorities.

The project will enhance sections of the current FEMA-approved Mitigation Plan, such as: (1) The risk and vulnerability assessment based on new information, and (2) The mitigation strategy, specifically strengthening the linkage to mitigation action implementation, with emphasis on available new BRIC project grant funding. Evaluation criteria for BRIC includes whether a proposed infrastructure investment was identified in an Advance Assistance grant.

Critical Customer Hubs

HSEO is partnering with Hawaiian Electric to apply for Critical Customer Hubs (CCH) through FEMA's Building Resilient Infrastructure and Communities (BRIC) program. This collaboration came out of "Strengthening Ko'olaupoko: A Community Resilience Initiative" ("Ko'olaupoko Initiative") led by Hawaiian Electric which had the initial kick-off meeting on October 29, 2018 with subsequent workshops over the last two years.

The Ko'olaupoko Initiative is a collaboration with Ko'olaupoko community leadership on solutions to ensure a safe recovery for area services and residents in the aftermath of a severe hurricane. The HSEO presented the BRIC opportunity to stakeholders at an Energy Working Group meeting in October 2020 and applied in January 2021. The application was the highest ranked Hawai'i submission, but unfortunately was not selected. In fact, no Hawai'i projects were funded; only 10 states/jurisdictions received awards, and no energy projects were selected nationwide. As a result, there has been ample feedback to FEMA and efforts made to ensure a more equitable distribution of funding in subsequent years.

HSEO has been working with the National Association of State Energy Officials (NASEO) to gather information for the purposes of positioning Hawai'i to be successful in applications for resilient energy infrastructure investments through BRIC. BRIC is FEMA's latest Hazard Mitigation Grant Program. BRIC is funded at 6 percent of the cost of disasters in the U.S. each year and includes a national competition that was funded at $446.4 million for fiscal year 2021 but will increase to over $700 million in fiscal year 2022. HSEO has continued engagement with Hawaiian Electric, HI-EMA, and Ko'olaupoko Initiative stakeholders to

reinvigorate the opportunity for CCHs to be funded by BRIC with lessons learned and best practices observed from the inaugural year. This effort also leverages and builds on the ICE-I MOU and Advance Assistance grant. HSEO submitted a new Notice of Intent to HI-EMA as the sponsoring state agency for the CCH project and was again identified as a priority project to be pursued. The application is to be submitted in FY 2022.

Resilient Community Hubs

In cooperation with the U.S. Department of Housing and Urban Development and Enterprise Communities, HSEO in fiscal year 2021 planned for a "Resilient Community Hubs and Resources" webinar in August 2021 and co-facilitated and participated in discussions and meetings with potential community partners: Hawai'i Department of Education, University of Hawai'i at Mānoa, City and County of Honolulu's Office of Sustainability and Resilience, Kapi'olani Community College, SHADE (Sustainable, Humanitarian Architecture & Design for the Earth), and Hau'ula's Ko'olaupoko Community, , to discuss status of Community Resilience Hubs in Hawaii, Resources and explore developing resilient community hubs and microgrids at individual facilities across the state, as well as supporting a proof of concept project. Resilient Community Hubs could potentially be funded by FEMA's BRIC Program.

Renewable Energy Exploration Facilitator (REEF)

HSEO has partnered with The University of Hawai'i at Mānoa's Laboratory for Advanced Visualization & Applications to develop 3D renderings of potential renewable energy buildout as the State approaches a 100% renewable portfolio standard in the electric sector by 2045. Simulating potential renewable energy buildout in a virtual environment will allow users the opportunity to better understand the potential visual impacts of future development, allowing better informed feedback earlier in the development process. HSEO plans to complete the first REEF visualization in FY 2022.

Collaboration with Partners

Interdependencies of Critical Energy Infrastructure (ICE-I) MOU

The ICE-I MOU signatories include the Hawai'i State Energy Office, Hawai'i Office of Homeland Security, USDOE, U.S. Department of Homeland Security, and U.S. Indo-Pacific Command (USINDOPACOM). Objectives of the MOU include Identifying comprehensive, integrated critical risk assessment and mitigation approaches, leveraging Parties' current authorities and efforts underway to address mutual priorities, institutionalizing a framework established through the MOU for persistent future collaborations, and

establishing integrated planning, training, and exercise events to feed a continuous improvement process. Pacific Northwest National Laboratory (PNNL) through funding from USINDOPACOM developed a scope of work from which to draw from in working towards achieving the outcomes identified through the MOU. The Advance Assistance grant under FEMA's Hazard Mitigation Grant Program discussed above is an identified activity under the scope of work developed by PNNL and the CCH proposal to be submitted under FEMA's BRIC program is aligned with the Advance Assistance grant objectives.

Proposed Legislation: Relating to Energy Assurance

With increasing amounts of renewable energy being generated and stored on and off the grid, new fast evolving threats, and risks to the state's aging energy infrastructure from cybersecurity issues, climate change, natural disasters, market vulnerabilities, and maritime/transportation bottlenecks, there is a critical need for the state to have better situational awareness of the status of all interdependent energy systems. This proposed bill updates antiquated statutory authority and legislative guidance in HRS section 125C to be supportive of the responsibilities and duties of the Chief Energy Officer. In particular, this proposed bill addresses deficiencies in the state's petroleum shortage response statutes, provides up-to-date policy guidance on information and analysis required to prepare for, respond to, recover from, and mitigate against any actual or potential energy supply disruption or shortage, better ensures that fuel products and energy resources are made available to emergency services and the public in an orderly, efficient, and safe manner, provides protections for confidential information collected to effectuate these purposes, and clarifies powers of Governor and the Chief Energy Officer in an energy shortage or state of emergency.

PART 3 Energy Program Administration and Funding

Given the integrated nature of the statutory objectives and activities, HSEO operates under a working organizational structure with statutory responsibilities assigned to branches. The formal reorganization of HSEO pursuant to Act 122, Session Laws of Hawai'i 2019, is still pending because of year-over-year budget and staffing reductions and the Governor's Emergency Proclamation.

Act 122 established the following mission for HSEO: "The purpose of the Hawaii state energy office shall be to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient clean energy economy." Act 122 created Hawai'i Revised Statutes (HRS) sections 196-71 and 196-72, and in so doing established the above mission, created the Chief Energy Officer position, amended numerous other statutes in addition to HRS Chapter 196, and removed the HSEO's discretionary use of the Energy Security Special Fund (ESSF), among other changes.

The pending reorganization incorporates Act 122 and the flexibility of exempt positions into four groups:

- Administration (Admin),
- Operations (Ops),
- Energy Efficiency and Renewable Energy (EERE), and
- Resilience, Clean Transportation, and Analytics (RCA).

Each branch is assigned a team of employees with knowledge, skills, and abilities relevant to the scope of objectives assigned to the branch. The Chief Energy Officer, Deputy Energy Officer, and branch managers regularly assign priorities and staff to complete work, including when work requires cross-branch synergy and designating a lead branch for a particular effort, which is frequent.

General Funds have been appropriated for HSEO positions and operating expenses since Fiscal Year (FY) 20 and the passage of Act 122. Prior to this, the Energy Security Special Fund (ESSF) covered the office's positions and operating expenses.

Act 9, Session Laws of Hawai'i 2020, appropriated $2,598,265 in FY21 General Funds for HSEO's positions and operating expenses, 7.8% less than FY20's appropriation. The position ceilings allocated by Act 9 included 5.0 permanent positions and 22.0 temporary positions; however, 3 of the 22 temporary positions were unfunded in the budget. $81,000 in Special

Funds was appropriated from the ESSF to pay special fund assessments mandated pursuant to Sections 36-30 and 36-27, HRS.

HSEO's staffing level was severely reduced, from 33 positions in FY19 to 24 funded positions in FY21. To provide adequate resources for HSEO activities and programs, two temporary 100% federal funded positions were established and filled during FY21. Although not sustainable, the positions were essential to fill critical ongoing needs.

A Data Science Specialist was hired to support operating a data governance framework for data policies, standards, and practices to achieve the required level of consistency, quality, and protection to meet office needs. The position will interface with state departments, county agencies, industry, public, and other stakeholder groups to design, develop, and implement this framework, with a focus on improvement of data quality and availability, while protecting sensitive data through modifications to HSEO and data stakeholder behavior, policies and standards, principles, governance metrics, processes, related tools, and data architecture. High quality, reliable energy data is necessary for the transformation of Hawaii's energy system and to support economic development and innovation.

HSEO also hired an Energy Analyst to support the work of the Powering Past Coal Task Force (PPCTF) and overall renewable energy development across the state. Since the initiation of the PPCTF, the PUC has identified several fossil fuel generators to be retired across several islands in a cadence of retirement every couple of years. Local government, developers, and community groups have requested HSEO to provide the same level of coordination and facilitation (or greater) for their islands and communities that HSEO has provided for the retirement of the coal plant. The transition from current fossil-based energy sources to low-carbon energy sources will require a variety of energy projects and technologies in site-specific locations across the state. This position is needed for successful identification of permits, processes, resources, and attributes, leading to effective management of issues and concerns, thus supporting HSEO efforts to improve processes to appropriately site, affordably price, efficiently permit, and successfully complete renewable energy projects in Hawaii.

With the COVID-19 pandemic continuing to impact the state's economy during FY21, HSEO maintained strict budget controls, limiting expenditures to critical high priority activities. By doing so, before the end of FY21, HSEO was positioned to offer $2.4 Million for transfer from the ESSF to the General Fund (Act 87, SLH 2021).

HAWAII STATE Energy Office

Administration

HSEO's administrative team provides accounting, grants management, budgeting, procurement and contracting services, personnel management, and internal tracking of programs and projects with timely status updates and metrics. The team is responsible for ensuring HSEO's compliance with federal regulations for its federal grants and agreements, with specialized knowledge of U.S. Department of Energy programs; the Hawai'i Public Procurement Code, chapter 103D, HRS; and the Hawai'i Ethics Code, chapter 84, HRS. The administrative team develops and implements processes and procedures to facilitate and expedite the work of the entire office. The team also assists the public by processing Uniform Information Practices Act (UIPA) requests for government records.

State Funds

Energy Security Special Fund

The Energy Security Special Fund was created in 2008 to support Hawai'i's clean energy initiative programs and projects that promote and advance dependable and affordable energy, renewable energy, energy efficiency, energy self-sufficiency, and greater energy security and resilience for the State and public facilities. In FY20, when General Funds were appropriated for HSEO's positions and operating expenses, the ESSF expenditure ceiling was eliminated.

In FY21, ESSF revenue from the Environmental Response, Energy, and Food Security Tax ("Barrel Tax") was $1,209,668, 11.5% less than FY20's revenue. An expected consequence of Act 75, SLH 2021, which cut the ESSF's Barrel Tax allocation from 5 cents to 4 cents per barrel, is a further reduction of ESSF revenue in FY22. The projected annual accrual of this fund at 4 cents per barrel is $1,040,000.

The FY21 expenditure ceiling for the ESSF only allowed for transfers to the General Fund for special fund assessments. The absence of a spending ceiling for general authorized program activities consistent with HRS section 201-12.8 meant that HSEO did not have the flexibility to respond to events as they occur, such as with COVID-19 impacts to energy assurance, and opportunities to leverage state matching funds to obtain a multiplier match of federal or other non-state funds.

Pursuant to Act 142, Session Laws of Hawai'i 2019, HSEO also transferred $250,000 from the ESSF to the Hawai'i Public Utilities Commission Special Fund for a rebate program that incentivizes the installation or upgrade of an electric vehicle charging system.

An ESSF expenditure ceiling was approved for FY22 to provide funds to leverage federal grant funding. This enables HSEO, as a grant subrecipient for an award from the Federal Emergency Management Agency, to provide the working capital then receive reimbursement of eligible project costs. The ESSF expenditure ceiling allows HSEO to contract for the development of prioritized energy mitigation strategies for critical Oahu facilities to help Oahu communities become more energy resilient to hazards. Expenditures from the ESSF are to be reimbursed with federal funds from HI-EMA. Without the upfront expenditure of ESSF monies, HSEO would not be able to execute the federal grant and would forfeit $600,000 in federal funds.

Federal Funds

State Energy Program Formula Grant

HSEO is the expending agency for USDOE State Energy Program (SEP) formula grant program. The allocation from USDOE for expenditure during FY21 was $425,070, with a cost match requirement of 20 percent. SEP provides annual funding to enhance energy security, advance state-led energy initiatives, and maximize the benefits of decreasing energy waste. Federal expenditures in FY21 were $117,240.

FEMA Hazard Mitigation Grant Program – HI-EMA Subaward

HSEO received a subaward from the Hawai'i Emergency Management Agency for a project entitled "Advance Assistance, Energy and Critical Infrastructure Vulnerability and Resilience Assessment." The project will include conducting and reporting on a comprehensive inventory and baseline assessment of O'ahu's major energy supply, distribution, and demand networks, and the State's critical infrastructures.

State Energy Program 2016 Competitive Award – HAVEN

The federal award for the project entitled "Hawai'i Advanced Visualization Environment Nexus" was completed on June 30, 2021. The goal of HAVEN was to demonstrate visualization as a means of analyzing and communicating the tradeoffs and interdependencies of resource deployment to achieve a 100 percent RPS for Hawai'i's electricity sector. Federal expenditures in FY21 were $22,542.

State Energy Program, American Recovery & Reinvestment Act (ARRA) – Repurposed

In 2016, the USDOE allowed states to repurpose remaining funds in their ARRA financial program toward other eligible SEP activities. USDOE approved HSEO's use of funds for clean transportation; policy, planning, and energy security; technical assistance; and energy analytics. In FY21, HSEO administered $1,268,614 of SEP-ARRA repurposed funds with expenditures of $149,209. HSEO established and filled a temporary Data Science Specialist position in January 2021 and a temporary Energy Analyst position in June 2021 using SEP-ARRA funds.

Energy Efficiency & Conservation Block Grant – Repurposed

USDOE also allowed states to repurpose remaining funds in their EECBG financing program toward other eligible EECBG activities. USDOE approved HSEO's use of funds for financial incentives for energy efficiency; energy efficiency and conservation programs for buildings and facilities; and building codes and inspection services. In FY21, HSEO administered $2,556,884 of EECBG repurposed funds with expenditures of $81,254.

Petroleum Violation Escrow Funds

Beginning in 1983, additional funds became available to states because of alleged oil company violation of the federal oil pricing controls in place from 1973 to 1981. The funds, known as Petroleum Violation Escrow (PVE) funds or oil-overcharge funds, must be used to provide indirect restitution to energy consumers through a variety of energy related programs. States may use these funds to finance SEP activities. HSEO is currently administering $303,060 of remaining PVE funds.

Other Funds

VW Settlement Trust Funds

In 2018, DBEDT became the lead agency for administering Hawai'i's allocation from the Volkswagen (VW) Diesel Emissions Environmental Mitigation Trust. HSEO is responsible for deploying Hawai'i's $8.125 million allocation from the Trust. Hawai'i's Beneficiary Mitigation Plan includes the following eligible clean transportation programs to achieve the goals of the Trust:

- $4.15 million to projects which electrify Class 4-8 School Buses, Shuttle Buses, or Transit Buses,
- $2.75 million to projects which contribute to Hawai'i's Diesel Emission Reduction Act, and

- $1.22 million to support projects which facilitate the deployment of Light Duty Zero Emission Vehicle Supply Equipment.

VW expenditures in FY21 were $50,230.

Hawai'i Natural Energy Institute – Agreement for Services

In 2019, HSEO entered into an agreement to provide services to the Hawai'i Natural Energy Institute (HNEI) in coordination of HNEI's work. HSEO is to provide (or subcontract to provide) energy efficiency program support, renewable energy generation diversification and support, grid opportunity assessment, and clean transportation transition support.

Energy Program Funding Tables

The following tables are provided:

Table 2: Expenditures from the Energy Security Special Fund, pursuant to HRS section 201-12.8;

Table 3: Hawai'i Clean Energy Initiative Program – Fiscal Year 2022 Spending Plan, pursuant to HRS section 196-10.5; and

Table 4: Administratively Established Accounts of Funds as of June 30, 2021, pursuant to HRS section 37-52.5.

Table 2: Expenditures from the Energy Security Special Fund

	Actual FY2021	Projected FY2022
BEGINNING FUND BALANCE	**3,237,356**	**1,767,988**
REVENUES		
Environmental Response, Energy and Food Security Tax	1,209,668	1,040,000
Investment Pool Interest	18,279	8,000
Solar Water Heater Variance Fees	13,705	5,000
TOTAL REVENUES	**1,241,652**	**1,053,000**
EXPENDITURES		
Hawaii State Energy Office Operations:		
Special Fund Assessments	61,020	-
Programs	-	650,000
TOTAL EXPENDITURES	**61,020**	**650,000**
TRANSFERS		
PUC Special Fund (Act 142, SLH 2019)	250,000	100,000
Transfer to General Fund (Act 87, SLH 2021)	2,400,000	-
NET TRANSFERS	**2,650,000**	**100,000**
ENERGY SECURITY SPECIAL FUND BALANCE	**1,767,988**	**2,070,988**
Pursuant to Section 201-12.8, HRS		

HAWAII STATE Energy Office

Table 3: Hawai'i Clean Energy Initiative Program – Fiscal Year 2022 Spending Plan

ANNUAL SPENDING PLAN based on anticipated spending levels for FY22	**State Funds**	**Other Funds**	**Total**
Hawaii State Energy Office Operations	1,958,082	564,000	2,522,082
Programs and Projects	650,000	3,444,449	4,094,449
TOTAL	**2,608,082**	**4,008,449**	**6,616,531**

FUNDING SOURCES:			
State Funds			
General Funds	1,958,082		1,958,082
Energy Security Special Fund	1,767,988		1,767,988
Federal Funds			
DOE - State Energy Program - Program Year 20		1,021,319	1,021,319
DOE - State Energy Program - Program Year 21		425,100	425,100
DOE - SEP Competitive 2016 - HAVEN		11,030	11,030
DOE - Energy Efficiency & Conservation Block Grant *		250,000	250,000
DOE - SEP American Recovery & Reinvestment Act *		460,000	460,000
FEMA - Advance Assistance		500,000	500,000
Trust Funds			
VW Settlement Trust Funds		1,241,000	1,241,000
US Climate Alliance Grant		100,000	100,000
TOTAL FUNDS	**3,726,070**	**4,008,449**	**7,734,519**

* Repurposed ARRA Funds

Pursuant to Section 196-10.5, HRS

Table 4: Administratively Established Accounts of Funds
As of June 30, 2021

APPROPRIATION ACCOUNT/TITLE	MOF	REVENUE	EXPENDITURES	ENCUMBRANCES	ENDING BALANCE
S-17-216 STATE ENERGY PROGRAM-ARRA REPURPOSE	N	1,513,786	387,055	285,953	1,126,732
S-17-516 HI ADV VISUALIZATION ENVIRONMENT NEXUS	P	215,147	204,117	11,030	11,030
S-17-518 EECBG - ARRA REPURPOSE	P	2,664,229	188,600	149,617	2,475,629
S-18-255 STATE ENERGY PROGRAM	N	136,841	136,841	503,626	-
T-20-910/T-21-910 VW DIESEL EMISSIONS ENVIRONMENTAL MITIGATION TRUST-NON-ADMIN EXP	T	3,389,096	-	-	3,389,096

MOF = Means of Financing
N = Federal Funds
P = Other Federal Funds
T = Trust Funds

Pursuant to Section 37-52.5, HRS

HSEO Goals, Plans and Measurements

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions	2-year Actions	5-year Actions	Measure Performance
Energy Assurance and Resiliency	Continue to build out HSEO's SERT and expand office-wide capability to support SESF 12 activities to prepare for effective discussion-based exercises, as well as development and implementation of the actual exercises that provide needed feedback and input needed for updating state level plans and developing institutionalized capacity within the HSEO and State.	Contract for services to develop training exercise workshops for SESF 12/SERT; identify and obtain funding for a second position to support energy assurance operations and training.	Implementation of training exercise workshops for SESF 12/SERT; recruit and train a second position to support energy assurance operations and training.	All HSEO staff cross-trained in SERT responsibilities and business continuity of operations to ensure SERT capacity and effectiveness.	Number of staff and stakeholders trained in the roles and responsibilities related to SESF 12: Energy.
	Develop an Energy Common Operating Picture (COP) for both energy assurance and resiliency planning and emergency response.	Introduce legislation to amend HRS 127C. Energy assurance legislation to update decades old statute to clarify authorities to collect relevant information from energy market participants under states of emergency. Expands energy information to be collected to include renewable sources.	Implement Advance Assistance grant assessing Oahu's energy supply chain identifying projects and strategies for integration into State and County Hazard Mitigation Plans; update energy assurance operations and training; develop and implement data management protocols.	Energy assurance capability that incorporates all energy resources on a given island to enhance island energy security and overall resiliency.	Energy stakeholders coordinated with, energy supply chains monitored, percentage of events staffed in the role of SESF 12.
	Advance resiliency and investment in resilient energy supply infrastructure throughout Hawai'i. BRIC, Advance Assistance grants, and other energy resiliency grant opportunities coordinated as relevant with sister agencies at the State and county level.	Apply for Advance Assistance Planning Grant and for Building Resilient Infrastructure and Communities (BRIC) grant; coordinate and strengthen statewide BRIC applications relating to energy.	If awarded BRIC grant, implement grant. Develop applications for projects identified in the Advance Assistance grant under the BRIC program.	Develop a self sustaining pipline for energy resiliency investments in Hawaii supported by Advance Assistance grants, State and County Hazard Mitigation Plans, and utility planning documents.	Number of community life line infrastructure investments and strategies indentified. Energy projects integrated into state and county hazard mitigation plans. Federal and private dollars leveraged.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions	2-year Actions	5-year Actions	Measure Performance
Renewable Energy Deployment	Track progress of the Stage 1 and 2 solar plus battery storage and standalone battery storage projects to ensure the timely decommissioning of Hawai‘i's only coal plant. Identify and facilitate local workforce employment opportunities. Support PPCTF.	Survey developers of current, contracted, and proposed large renewable energy projects about development timelines, anticipated issues, workforce needs, and areas of opportunity or concern. Engage workforce development entities to meet identified needs. Provide support to agencies permitting these projects to encourage timely permitting. Obtain funding to continue to support renewable energy project deployment.	Implement identified workforce development initiatives. Monitor progress of projects toward guaranteed commercial operation date and proactively address issues that arise. Identify dedicated funding to continue staff support.	Leverage state funds to obtain federal funds. Evaluate success for potential modification or replication.	Support given to permitting, construction, and operation of renewable energy projects, both small and large, including improving processes for planning and appropriate siting.
	Support informed siting and permitting of large renewable energy and related projects to reduce risks and facilitate more appropriate siting of grid-scale projects.	Conduct needs assessment with renewable energy developers, consultants, and permitting agencies to identify potential project siting and permitting needs. Prioritize these needs, including evaluating existing HSEO resources (e.g., Permitting Wizard, EnerGIS, online permitting, etc.) and determine which priority needs can be addressed, potentially with Federal and National Laboratory support. Contract for services.	Develop, demonstrate, finalize, and deploy tools.	Maintain and update the tools to address contemporary issues and subjects regarding the siting and permitting of large renewable energy projects in Hawaii.	Leverage of state funds to obtain federal funds. Successful deployment of tools. Number of users.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions	2-year Actions	5-year Actions	Measure Performance
Energy Efficiency	Provide leadership and support to reduce state energy use. Hawaii Revised Statutes, Section 196-30, requires that "each state department with responsibilities for the design and construction of public buildings and facilities" is to evaluate the energy efficiency of public buildings larger than 5,000 square feet or using more than 8,000 kilowatt-hours annually, in a process known as "benchmarking." This helps identify building upgrade opportunities that can [lower] energy and operating costs, and it facilitates continuous improvement by providing diagnostic measures to evaluate performance over time. The goal to reduce state energy use by 20% (from 2005 levels) was acheived in 2021.	Using results of previous State [HSEO and partners] benchmarking of 416 public facilities, including more than 2,600 buildings covering more than 29 million square feet, identify highest potential ("Tier 1") sites for immediate action. The benchmarking project found potential for all state agencies to save more than 56 million kilowatt hours annually— equivalent to saving more than $25 million annually using current electricity rates. Additional savings are possible from operational and Strategic Energy Management measures.	Identify "Tier 2" State facilities with energy efficiency retrofit potential and likely candiates for ESPC or other financing options. For both Tier 1 and TIer 2 sites, identify demand response or other potential tariff /aggregator participation options to reduce State agency energy (electricity and fuel) costs.	Provide technical assistance to support SOH agencies in financing energy efficiency and cost reductions via operational changes, energy savings performance contracts, or other mechanisms. Hawaii Revised Statutes, Section 196-30, also requires that every five years, major facilities be "retro-commissioned."	Number of State facilities benchmarked. Rebate or energy cost savings identified for capital improvement projects or energy efficiency retrofits. Measured energy savings. Calculated bill savings based on actual electricity prices.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions	2-year Actions	5-year Actions	Measure Performance
Energy Efficiency	Energy Code Updates, Working Group, and Training. Pursuant to Act 122, 2019 and HRS Section 107-22(4), HSEO is a voting member and active participant on the State Building Code Council (SBCC) and the Council's Inverstigative Committee for the International Energy Conservation Cde (IECC). Provide leadership in Energy Code and Community College Train the Trainer events and toolkits. Increase the knowledge of advanced design and construction practices in community college and continuing education programs. Also, improve the awareness of and interest in employment opportunities in code official and code verification professions. Establish a working group to develop Hawaii-specific provisions for the 2021 IECC for the State Building Code Council.	Provide training on the 2018 IECC and State and County Amendments. Conduct 2021 IECC Working Group meetings to discuss industry, code official and other stakeholder concerns. Obtain Federal funding. Contract for services.	Train-the-trainer (in-person or online) workshop preparation: Collaborate to recruit workshop attendees and speakers. April 2022 – June 2023 Curriculum delivery and evaluation: Collaborate to deliver and evaluate the curriculum. Develop provisions for the 2021 IECC.	Adopt 2021 IECC at the SBCC with Hawaii Amendments and at the County level with County Amendments. Recruit and expand training programs to trade and professional associations via on-going partnership with the community colleges.	Utilization of train-the-trainer toolkit. Number of instructors and students participating. Number of other states that participate with Hawai‘i, Illionis, and Nevada. Meetings of the 2021 IECC working group and list of provisions for Hawaii Amendments.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions	2-year Actions	5-year Actions	Measure Performance
Clean Transportation	Advance investment in clean transportation infrastructure and vehicle adoption throughout Hawaii through the Volkswagen Settlement, Diesel Emission Reduction Act (DERA) and other federal grants, and designation of clean transportation corridors coordinated as relevant with sister agencies at the State and county level and transportation stakeholders.	Release the Vehicle Assistance Program (VAP) for eBuses rebates funded through the Volkswagen Settlement fund and DERA. Refine deployment plan for the investment of the remaining EV charging infrastructure dollars and eBus program under the Volkswagen Settlement taking into account strategies included in the MDHD MOU and the impacts of COVID-19. Submit Alternative Fuel Corridor for Kauai County.	Continue with the deployment of the Volkswagen Settlement fund consistent with the deployment plan. Work with state and county agencies, local stakeholders, and market participants to leveraging Volkswagen Settlement funds as appropriate and federal programs as possible to implement strategies under the multi-state MDHD MOU.	Deploy all Volkswagen Settlement funds except for the final two years of VAP rebates. Through collaboration with HDOT, counties, and relevant state agencies and stakeholders develop a plan to systematically access and deploy federal funds through a variety of programs strategically filling market gaps.	Alternative fuel vehicles adopted, GHG and NOx emission reductions, federal and private funds leveraged
	Public fleet conversion - Explore and participate in innovative ways to adopt alternative fuel vehicles. Support other State and county agencies as they transition to a decarbonized fleet.	Utilize HDOT RFP to procure EVs as a service for HSEO's EV and act as a resource to other state and county agencies looking to access the HDOT RFP to electrify their fleets. In collaboration with the multi-state MDHD MOU signatories, conduct outreach to stakeholders and finalize the MDHD MOU action plan.	Continue to serve as a resource to State and county agencies for conversion of fleets to alternative fuel vehicles including utilization of HDOT's RFP. Collaborate with State and county agencies to deploy strategies identified in the MDHD MOU.	Develop and implement a clear pathway for State agencies to have a net-negative carbon fleet by 2035.	Number of State and county agencies supported and percentage of the total State and county fleet the agencies represent. Percentage of State and county fleet converted.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions	2-year Actions	5-year Actions	Measure Performance
Stakeholder and Community Education, Outreach and Engagement	Implement an ongoing community outreach and engagement program that informs the public, community members, and other energy stakeholders about Hawai'i's clean energy transformation goals, policies, projects and initatives and provides communities a voice. Includes the launch of the Wayfinders Program. Develop a Statewide Clean Energy Public Education and Outreach Program in coordination with Hawaii's Institutions of Public Education expands and develops clean energy professional development and classroom curricula and toolkits and provide professional development credits for Hawaii DOE educators. Contract for services.	Implement a comprehensive stakeholder engagement, strategic communications and marketing plan. Implement an integrated strategic communications program across all communication platforms including digital and print media. Launch an integrated HSEO/HCEI website including an online community engagement platform and featuring accessible and portable data. Contract for services. Oversee the Clean Energy Education contract to develop curricula and toolkits and provide professional development credits for HDOE educators, in collaboration with the HDOE.	Continue statewide facilitated, community-based workshops. Draft Statewide Energy Strategy. Contract for services. Assess Clean Energy Education Program impacts and apply for additional federal funding support if needed. Expand the Clean Energy Education program to additional schools. Update and expand curricula. Secure dedicated funding support for Wayfinders Program.	Develop and grow working groups to include community leaders, industry, and non-profit organizations engaged in develeping the Statewide Energy Strategy. Provide HSEO staff to community, industry, and intergovernmental events. Reassess HDOE Clean Energy Public Education Program to determine ongoing needs.	Improved stakeholder engagement, greater public awareness and satisfaction, effective decision making. Solicited feedback from community members on the value provided by the improved communications, outreach and engagement. Number of teachers that participate in developing, are trained in, and use the curriculum. Results of teacher and student pre and post knowledge assessments. Contractor's final report including measured results of the program.
	Promote educational and career entry pathways into clean energy. Prepare for potential Federal funding directed to State Energy Offices for energy sector employment.	Fund three Data Science Fellows from the University of Hawaii in support of Data Analytics objectives. As noted under "investment in clean transportation" submit an application for an alternative fuel corridor on Kauai, a qualifying criteria for some federal programs.	Identify energy sector workforce opportunities, obtain funding for workforce tranining and on-the-job support, in collaboration with community colleges and other training providers, trades groups, and workforce development organizations.	Continue and expand oportuntieis for Energy Workforce project.	Number of employees trained; apprenticeships or placements into clean energy employment.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions	2-year Actions	5-year Actions	Measure Performance
Data Analytics	Develop a data governance framework for energy data to support measurement and evaluation of progress towards state energy goals, identify opportunities, and promote outreach and education. Design the framework to better disseminate data to the public. Develop the energy data governance framework for Hawai‘i through a federally funded Data Scientist and Fellows in partnership wtih UH Data Science Institute.	Support the new data scientist position with graduate data scientist students. Identify priority data governance activities. Create data sharing platform.	Implement identified data governance priority activities. Train graduate students. Expand data sharing and portability. Identify and pursue potential long-term funding for the position and activities.	With a data governance framework largely in plact, advanced data analytics are underway and available to the public. Explore monetization of data analytics per HRS §196-72(c)12. Dedicated funding source supports ongoing data science activities.	Common data standards and practices across Hawai‘i's energy ecosystem. Accessibility of data sets.