JOSH GREEN, M.D.
GOVERNOR
SYLVIA LUKE
LT. GOVERNOR
JAMES KUNANE TOKIOKA
DIRECTOR
DANE K. WICKER
DEPUTY DIRECTOR

DEPT. COMM. NO. 288

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

KA ʻOIHANA HOʻOMOHALA PĀʻOIHANA, ʻIMI WAIWAI A HOʻOMĀKAʻIKAʻI

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DTS# 202312200917L

December 20, 2023

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

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

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

For your information and consideration, I am transmitting a copy of the Hawaiʻi State Energy Office's Annual Report on December 20, 2023, as required by Section 196-71, Hawaii Revised Statutes. In accordance with Section 93-16, Hawaii Revised Statutes, I am also informing you that the report may be viewed electronically at: http://dbedt.hawaii.gov/overview/annual-reports-reports-to-the-legislature/.

Sincerely,

James Kunane Tokioka

Enclosure

c: Legislative Reference Bureau

HAWAIʻI STATE ENERGY OFFICE

Driving the **Transition**

Hawaiʻi State Energy Office 2023 Annual Report

THIS REPORT FULFILLS THE REPORTING REQUIREMENTS FOR:

ACT 100, SECTION 7 (SLH 1999)
ACT 122 (SLH 2019)
ACT 216 (SLH 2022)
HRS 196-10.5(7)(C)
HRS 196-41(C)(3)
HRS 201-12.8(C)
HRS SECTION 141-9
HRS SECTION 201-104
HCR 17 (SLH 2023)
SCR 82 SD1 (SLH 2023)

THIS ANNUAL REPORT REQUIRED BY EACH OF THESE STATUTES HAVE BEEN COMBINED INTO THIS SINGLE, COMPREHENSIVE REPORT.

energy.hawaii.gov

Contents

*- Denotes statutory reporting requirement

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.

Message from the Chief Energy Officer

I am honored and privileged to assume the role of Chief Energy Officer, upon my appointment by Gov. Josh Green to a four-year term. The Hawai'i Energy Office (HSEO) holds a special place in my heart, having served as Energy Administrator from 2011-16 during the formative years of the Hawai'i Clean Energy Initiative. Since I last served, Legislature has expanded HSEO's statutory mandate to encompass energy security, resilience, jobs, affordability, and the growing urgency of the climate crisis. As always, I am inspired and impressed by the remarkable skills, expertise, and knowledge of HSEO's dedicated staff and managers.

As the pioneer state in establishing a 100 percent renewable portfolio standard (RPS) for electricity, Hawai'i has set the stage as a leader in the energy transition. Today, several states and territories have followed our lead, underscoring the importance of our commitment. These things are easier said than done, and my office recognizes that our journey toward energy self-sufficiency and decarbonization will present challenges, twists, and turns. Embracing these challenges is integral to our mission.

On Augst 8th, 2023, we were confronted by the devastating fires on Maui. In the immediate response to the fires, HSEO actively supported the State's Emergency Operations Center under the leadership of Hawai'i Emergency Management Agency (HIEMA), contributing to critical energy infrastructure needs and providing vital information to first responders and the public. As we transition into long-term recovery, our commitment to disaster response and climate resilience remains unwavering.

Since the tragedy on August 8th, Hawai'i has secured over $110 million for grid resilience, with three successful applications selected by the U.S. Department of Energy (USDOE) Grid Resilience and Innovation Partnerships program created by the Infrastructure Investment and Jobs Act (IIJA). HSEO led two of these applications, in cooperation with Kaua'i Island Utility Cooperative (KIUC), and Hawaiian Electric (HECO) led the third with HSEO playing a supporting role. This cooperation and support at the highest levels of the Biden Administration and USDOE as well as among our private sector and nongovernmental partners is about much more than HSEO winning competitive grants, it is the collaborative spirit that will make our state climate resilient and energy self-sufficient.

HSEO also aims to ensure access to the benefits of the clean energy transition for everyone. This includes providing training for quality local jobs in clean energy. This year, HSEO worked with the Hawai'i Chamber of Commerce and University of

Hawai‘i Community Colleges, among others, to launch Good Jobs Hawai‘i and the Clean Energy Sector Partnership. This three-year effort will train or up-skills hundreds of Hawai‘i residents to make the transition a reality, and we remain committed to developing other policies and programs that support the creation of quality local jobs.

Looking ahead, next year HSEO will begin a home energy efficiency retrofit and electrification rebate program funded by the Inflation Reduction Act (IRA). In coordination with partners like the Hawai‘i Green Infrastructure Authority, we aim to make it easier for households to save energy and save on their energy bills. While our valiant bid to become a Hydrogen Hub was unsuccessful, we gained much from the experience to prepare a competitive $1 billion application with more than 43 committed partners. From lessons learned, we are evaluating alternative options for energy supplies, including geothermal, that can insulate families and small businesses from oil price volatility, provide reliable power, and significantly reduce our environmental impact.

Through the IIJA and IRA, Congress and the Biden Administration have made unprecedented, historic investments in climate resilient infrastructure. Deputy U.S. Energy Secretary David Turk called it a “magic moment” in his keynote at the Hawai‘i Energy Policy Forum in January 2023. Recognizing this, HSEO will continue to capitalize on these opportunities to ensure the clean energy transition, and work with partners across the state to improve our climate resilience and affordability. I look forward to collaborating with all stakeholders, both in the public and private sectors, as we navigate the challenges and emerge stronger in the face of emerging threats.

With Aloha,

Mark B. Glick

Chief Energy Officer

Executive Summary

Overview

Since Hawai‘i became the first state in the nation to set a 100 percent renewable portfolio standard (RPS) for the electricity sector by 2045 with Act 97 Session Laws of Hawai‘i 2015, Hawai‘i has made substantial progress moving toward a cleaner energy sector. This report reviews the work of Hawai‘i State Energy Office (HSEO) over the past year in effort to lead the state’s energy transition.

Governor Josh Green, M.D., appointed HSEO veteran Mark B. Glick as the state’s Chief Energy Officer (CEO), who was confirmed by the Senate on April 3, 2023. This is Glick’s second stint in the Energy Office, having served previously as Energy Administrator leading the development of Hawai‘i’s Clean Energy Initiative, the precursor to today’s carbon-free pathway. Glick named Stephen C. Walls as Deputy Energy Officer, who worked on the Hawai’i Clean Energy Initiative while at the U.S. Department of Energy (USDOE) where he also co-established the national Energy Transition Initiative.

In working with the Green Administration to establish the Hawai‘i State Energy Office’s energy strategy, the CEO aligned the agency’s workstreams with the elements of a successful energy transition: Renewable generation; grid modernization; energy storage; clean transportation; energy efficiency; and governance and equity. A new branch was formed that focused on achieving an equitable energy system through access to quality local jobs and community engagement. The new Jobs and Outreach branch (JOBs) joins the Energy Efficiency and Renewable Energy branch (EERE), the Resilience, Clean Transportation, and Analytics branch (RCA), and the Operations branch (OPs), along with the CEO’s Executive Office team. The Office reorganization incorporates Act 122 and the flexibility of exempt positions.

Energy Efficiency and Renewable Energy Branch

Energy efficiency and conservation—using more efficient technologies, energy-conserving systems, and beneficial policies—reduces the amount of energy that needs to be produced. Energy efficiency and conservation are “energy resources” in their own way. Efficiency is often the lowest cost of any available resource, costing less to save a kilowatt-hour than it would cost to generate that kilowatt-hour and making it a least-cost method of balancing energy demand with adequate energy supplies.

One of the most effective long-term energy efficiency measures is the use of updated energy codes and standards when constructing new buildings. Energy codes are updated nationally every three years, based on improved methods and materials, reviewed, and approved by the State Building Code Council, and enacted by each of the counties. HSEO conducts energy code training for design,

engineering, and code professionals, provides testimony in support of county code adoption, and supports improved efficiency standards for appliances.

Buildings owned and operated by the State of Hawai‘i are also significant users of energy; HSEO assists agencies to identify cost-effective energy- and resource-efficient upgrades, including the use of rebates, financing mechanisms, and elective pay options.

HSEO is also preparing for a major increase in energy efficiency incentives for commercial and residential buildings, and for the launch of rebate programs to assist primarily low- and moderate- income residents.

Businesses are also actively reducing the energy and resource intensity of their operations. This year, the Hawai‘i Green Business Program recognized its largest ever annual cohort and expanded to include more small businesses in rural areas across the state, and a total of 37 businesses, venues, and events received awards for undertaking efficiency and sustainable business practices that will help their bottom line while advancing Hawai‘i’s clean energy and sustainability goals.

Hawai‘i shift from carbon-intensive imported fossil fuels features locally available energy sources: power from the sun, the wind, the ocean, and the land. As new energy generation is built, it becomes clear that supplying our energy demand requires land, resources, time, and effort. HSEO provides technical assistance and other support to communities and developers alike in the quest for energy self-sufficiency.

The construction of new renewable energy projects, both large and small, continued at a rapid pace this year, with additional completions scheduled for the coming year. Solutions were found to logistical challenges for previously approved projects, and HSEO engaged with regulators, communities, individuals, and organizations to envision and propose new projects and approaches, with the potential for significant savings and incentives from recent Federal legislation to support Hawai‘i-based projects. In 2023 Hawaii’s statewide renewable electricity portfolio reached 40.7% under the old calculation method (33.17% using the new calculation method).

Jobs and Outreach Branch

This year, HSEO supported the launch of Good Jobs Hawai‘i and led the launch of the Clean Energy Sector Partnership, working with the Hawai‘i i Chamber of Commerce and University of Hawai‘i Community Colleges, among others. This three-year effort will train or up-skill hundreds of Hawai‘i residents in the clean energy and skilled trades sectors, while remaining committed to other policies and programs that support the creation of quality local jobs. Complimenting these initiatives is HSEO’s keiki-to-career pathways work through the development of K-12 energy curriculum, teacher training, Energy Pathway pilot at select high schools, and service on the Hawai‘i Department of Education’s Career and Technical Education Advisory Board.

HSEO continues to grow its innovative Clean Energy Wayfinders outreach program with the placement of six (6) new Wayfinders on Kauaʻi, Oʻahu (2), Molokaʻi, Maui, and Hawaiʻi Island. In 2023, HSEO initiated new professional training for the Wayfinders through Hawaiʻi Sea Grant and will secure in early 2024 $1M in federal funds to expand the program's capacity to provide community-based technical assistance on priority clean energy initiatives.

Resilience, Clean Transportation, and Analytics Branch

Resilience

Under the umbrella of Resilience HSEO prioritizes the reliable delivery of fuel and electrical energy to support economic recovery and meet the demands of a growing, clean economy. A baseline capacity supporting this role is a "common operating picture" (COP)— a continuously updated overview of Hawaiʻi's energy system for energy planning and incident response. For planning HSEO completed a $600,000 grant under FEMA Hazard Mitigation Grant Program (HMGP) to assess the energy supply chain on Oʻahu 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. Notably, while not surprising, the data and analysis supported the conclusion that fire is one of the top two risks. HSEO will receive $450,000 through FEMA BRIC funding to do the same assessment for each county to complete a statewide picture.

In addition, HSEO deploys capital to support investment in energy assurance and grid modernization. HSEO, in collaboration with the Hawaiian Electric Company, was selected for a $8.33 million FEMA BRIC National Competition for Critical Customer Hubs (CCH). CCHs are microgrids in areas with several Community Lifeline customers powered by mobile generation, allowing continued operation during a longer-duration outage. The CCH project was the first National Competition award for Hawaiʻi. HSEO also administers over $15 million in IIJA Section 40101(d) funding for grid resilience. HSEO will use the planning done under both Advance Assistance projects noted above to evaluate and select projects.

For grid modernization HSEO, in partnership with KIUC, will receive more than $17.9 million in funding through the U.S. Department of Energy Grid Resilience and Innovation Partnerships (GRIP) Program. Leveraging existing power generation equipment, the Utility Solar Grid Forming Technology (USGFT) and Synchronous Condenser Conversion Technology (SCCT) demonstration projects offer innovative grid forming technologies demonstrating solutions for expanded renewables dispatch and reliable island grid operation. Together, these solutions are critical technologies to enable KIUC to achieve its 100% renewable energy goal within the next ten years.

Clean Transportation

Under Clean Transportation two areas of focus for HSEO has been supporting the continued adoption and deployment of infrastructure for zero emission vehicles (ZEV) and planning and programs to reduce the energy necessary to support the transportation services required by the residents of Hawai‘i.

To support EV adoption and charging infrastructure deployment HSEO has sought to leverage the investments that are being made throughout the state to meet 2030 and 2045 requirements. This is consistent with the addition to HRS, Chapter 225P through Act 226 of 2023 to work with HDOT and OPSD to develop plans to ensure that the State's electric charging capacity is sufficient, and State's electric charging capacity exceeds the rate by which electric vehicle sales are projected to replace internal combustion vehicle sales. HSEO has worked with HDOT on Hawai‘i’s National Electric Vehicle Infrastructure Program (NEVI) plan and applications under federal Charging and Fueling Infrastructure (CFI) program. For CFI HSEO has leveraged Volkswagen Settlement (VW) funds as the 20% cost match to pursue an additional $3M of funding. HSEO has also partnered with Hawai‘i Department of Health – Clean Air Branch for a medium- and heavy-duty vehicle rebate program leveraging VW funds to receive an incentive match of fifty cents on the dollar for the VW funds allocated to the rebate from the U.S. EPA.

Energy efficiency and conservation are also key tactics for the transportation sector to adequately power and decarbonize. For example, HSEO was awarded funding by the O‘ahu Metropolitan Planning Organization (OMPO) to conduct a multi-modal assessment to identify specific land-use and transportation needs and projects to reduce vehicle miles traveled and prepare them for inclusion in the Transportation Improvement Program. The project also includes the development of quantifiable metrics to improve multi-modal accessibility for people walking, rolling, biking, and using transit. Engaging with DOT and the metropolitan planning organizations on planning activities to better reflect the interdependencies of energy and transportation planning is a priority for HSEO. HSEO will continue to work with OMPO over the next year to support their O‘ahu Regional Transportation Plan (ORTP) integrating the scenarios developed in the ORTP into HSEO’s Engage model that was utilized for the Act 238 Decarbonization Study. The intent is to be able to analyze the impacts of transportation on energy use and deployment and visualize alternative scenarios.

Analytics

Analytics serves as a foundation for informed decision-making on all aspects of Hawai‘i’s energy transition. Under §196-72 the duties of HSEO include acting as the State's energy data clearinghouse by identifying, collecting, compiling, analyzing, and publishing, energy and clean transportation data and analyses. Quality data is necessary for HSEO to develop and maintain a quantitative capacity to analyze the effectiveness of energy resources, systems, and markets for policy, regulatory decisions, and energy emergency planning.

HSEO, in collaboration with the National Renewable Energy Laboratory (NREL) and supported by USDOE funding, has developed Engage, an open access, web application for energy system modeling. Similar models utilized in utility integrated grid planning proceedings cost tens of thousands of dollars in licensing fees per year. Engage provides a valuable tool by which HSEO can analyze policies and pathways to achieve state energy goals and was utilized to develop HSEO's Act 238 Decarbonization Strategy. With base models and scenarios now set up for all islands HSEO has built the capacity to continue analyzing alternative scenarios to assess new policies and evolving technologies. HSEO is also integrating Engage with visualization tools such as the Hawai'i Advanced Visualization Energy Nexus (HAVEN) making energy system modeling analysis more readily digestible to individuals who have a significant stake in the transformation of Hawai'i's energy system but who are not energy sector specialists.

HSEO has also developed a Data Portal to serve as the foundation for a single source repository of energy related data for modeling and analysis inputs to support the State's energy goals. The data portal is a transparent source of data including both source data and curated data sets which integrate multiple data sources. The Data Portal includes meta-data to support transparency as to what the data specifically represents and how it was generated to provide confidence in the modeling outputs and the representation of outcomes.

Operations Branch

The team is responsible for actively seeking, tracking, and ensuring compliance with federal funding opportunities for grants that align with HSEO goals and priorities. In 2023, the team processed applications for competitive and formula federal funds that secured more than $100 million for new programs to be implemented in Hawai'i over the next several years.

HSEO's Strategic Priorities

The report is organized by the six major elements that form the core of a resilient and environmentally responsible energy sector transition.

Energy transition elements:

1) Energy Efficiency.
2) Renewable Energy.
3) Grid Modernization.
4) Clean Transportation.
5) Energy Storage Systems.
6) Governance / Equitable Access.

HSEO distinguishes the way it affects change on the six elements of energy transition through four pillars of advocacy and engagement: Technical Assistance, Market Transformation, Community Engagement, and Workforce Development.

The activities described in the subsequent sections of this report will be tagged with one or more of these labels as applicable. Through these pillars, we drive progress in the six energy transition elements, ensuring a holistic and impactful transformation of the energy landscape.

Technical Assistance

Market Transformation

Community Engagement

Workforce Development

This framework underscores our dedication to addressing the challenges of today, including energy burden and quality local jobs, and positions us as leaders in shaping the future of sustainable energy, demonstrating to others that decarbonization can support a thriving economy. The report concludes with a thorough discussion of program administration and financial reports. The appendices include detailed financial statements and a brief description of one, two, and five-year plans.

Finally, HSEO notes this annual report is prepared in compliance with the following reporting requirements:

ACT 100 SECTION 7 (SLH 1999)
ACT 122 (SLH 2019)
HCR 17 (SLH 2023)
HR 37 (SLH 2023)
HRS 141-9
HRS 196-10.5(7)(C)
HRS 196-41(C)(3)
HRS 201-12.8(C)
HRS 201-104

Energy Efficiency

Introduction

Energy efficiency is foundational to Hawai'i's renewable energy transition. As Hawai'i develops new energy generation sources that match the needs of each community, with land and energy at a premium, Hawai'i is well served by improving the effective use of these precious energy resources. Energy efficiency works to improve the balance between energy use and availability. Reducing energy waste allows the renewable energy that is brought online to serve a higher proportion of Hawai'i's energy needs.

HSEO prioritizes the most cost-effective and impactful energy efficiency programs. Improved energy codes and efficiency standards are recognized as cost-effective measures that establish the minimum energy performance for commercial and residential buildings in Hawai'i. HSEO are engaged in development, evaluation, revision, and adoption of energy-related codes and standards that advance the State's energy goals and yield cost savings 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 with significant savings from lighting, cooling, water heating, and other measures. 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 or other methods to finance energy improvements.

Codes and standards

The first step in energy efficiency for any new building is to design and construct it to meet up-to-date energy codes and standards. It takes many years for energy-efficient building technologies, processes, and materials to progress through the steps of design, development, testing, evaluation, acceptance, and compliance, and to reach proven levels of cost-effectiveness before they are included in the International Energy Conservation Code (IECC). As certain provisions of the IECC become outdated, those sections of the code are updated in draft form. Every three years, a new version of the IECC is published that incorporates the updates that have taken place in the previous three years. Once a new code is published by the IECC, the State of Hawai'i's Building Code Council reviews the new code and discusses what changes, if any, should be made to the code before it is adopted in Hawai'i. As ex officio voting member and Chair of the State Building Code Council, HSEO was instrumental in the Council's adoption of the 2018 International Energy Conservation Code (IECC) with Hawai'i-specific amendments. HSEO assisted the counties in development of their codes and developed the proposed Hawai'i amendments to the IECC.

Also of importance are appliance efficiency standards. In FY2023 HSEO reviewed and supported appliance efficiency standards and actively participated in national webinars and meetings of the Appliance Standards Awareness Project; Act 224 (2023) authorizes the Chief Energy Officer to enforce minimum efficiency standards and adopt or amend efficiency standards. It sets minimum efficiency standards that go into effect in January of 2025 for portable electric spas, residential ventilating fans, toilets, urinals, and water coolers and allows manufacturers to utilize the Home Ventilating Institute's certified products directory certification program to meet certain standards.

 **Technical Assistance**

 **Market Transformation**

State agencies*

Continuing efforts by HSEO and State agencies to manage the State's energy use have resulted in a long-term reduction of electricity consumption; in FY2023, State of Hawai'i buildings consumed a total of 528,171,759 kWh of energy. This reflects a 151,261,890 kWh reduction in energy use from the FY2005 baseline of over 679 million kWh. Taking action to reduce electricity use in government saves energy and is essential to reaching greater energy efficiency in Hawai'i.

Act 239 (SLH 2022) requires state facilities to implement cost-effective energy efficiency measures. It also requires the design of all new state building construction to maximize energy and water efficiency, maximize energy generation potential, and use building materials that reduce the carbon footprint of the project. These actions move state government forward to lead by example on reducing energy cost by being more efficient. HSEO also informed state departments about House Resolution 198 (2023) which urges the Governor and state departments to investigate opportunities provided by the direct pay provision in the Inflation Reduction Act for solar projects in state facilities. State departments tasked with managing facilities, including the Department of Accounting and General Services, Department of Education, and Department of Transportation, are requested to designate a point person to prepare for the availability and deployment of the direct pay funding for energy systems on state facilities.

HSEO continues to collaborate with and provide information, training, and technical review for government agencies, professional associations, and educational institutions in Hawai'i to reduce energy use and to participate in performance contracting and other means of financing energy retrofits. In addition to in-house expertise, HSEO contracts with technical and contracting experts as well as the USDOE's national labs to provide in-depth review, analysis, and recommendations, and is requesting Federal support for projects to increase these efforts.

 **Technical Assistance**

Hawai‘i Green Business Program

HSEO coordinates the Hawai‘i Green Business Program (HGBP), which provides technical assistance to businesses and organizations to implement energy and resource-efficient practices and recognizes and promotes the success and value of the practices during an annual award ceremony.

In FY23, the Hawai’i Green Business Program recognized its largest ever annual cohort and expanded to include more small businesses in rural areas across the state. The program also recognized, in a formal, live-streamed awards ceremony at the Governor’s office, a total of 37 businesses, venues, and events for undertaking efficiency and sustainable business practices that will help their bottom line while advancing Hawai‘i’s clean energy and sustainability goals.

The program is more than 20-year partnership between the HSEO, the Department of Health, the Board of Water Supply, and the Chamber of Commerce of Hawai‘i. Expanding the program to include small businesses and organizations in rural areas has been initiated with the Clean Energy Wayfinders and supports the Justice 40 Initiative. Over 150 businesses, organizations, and events have participated and have been recognized under this program.

Energy efficiency performance standards

Energy efficiency is extremely cost-effective and resource-efficient; it often costs less to avoid using a kilowatt-hour (kWh) than it does to generate or purchase a kWh. In formal energy efficiency programs, each dollar spent on efficiency generally saves ten times that amount on energy bills. 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.

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 (PBF) surcharge is collected via utility customers’ electricity bills.

Hawai‘i continues to keep pace with its target goal of reducing electricity demand by 4,300 gigawatt-hours by 2030 through efficiency and conservation measures, with significant savings from lighting, cooling (air conditioning), water heating, and other measures.

HSEO was also involved in ongoing discussions to establish an energy efficiency goal beyond 2030, that would be in line with 2045 and Hawai‘i’s 100% renewable and clean energy economy decarbonization objectives. As an on-going effort, HSEO participates in the Public Utilities Commission’s Public Benefits Fee Energy Efficiency Technical Assistance Group and EEPS Technical Working Group, as well in the NASEO-NARUC and Hawai‘i Grid Interactive Efficient Buildings Working Groups, and meets regularly with the Hawai‘i Green Infrastructure Authority and the Public

Benefits Fee Administrator to collaborate and coordinate on statewide policies, programs, projects, opportunities, technological updates, and information.

HSEO has and will apply for and coordinate State activities that support market transformation with funding from federal energy programs such as the Infrastructure Investment and Jobs Act of 2021 - Energy Efficiency Revolving Loan Fund, the Energy Efficiency Conservation Block Grant, the 2022 Inflation Reduction Act Sections 50121 Home Efficiency Rebates, 50122 Home Electrification & Appliance Rebates, 50131 Latest and Zero Building Energy Code Adoption, as well as other opportunities as they arise.


Market Transformation

Renewable Energy Generation/Production

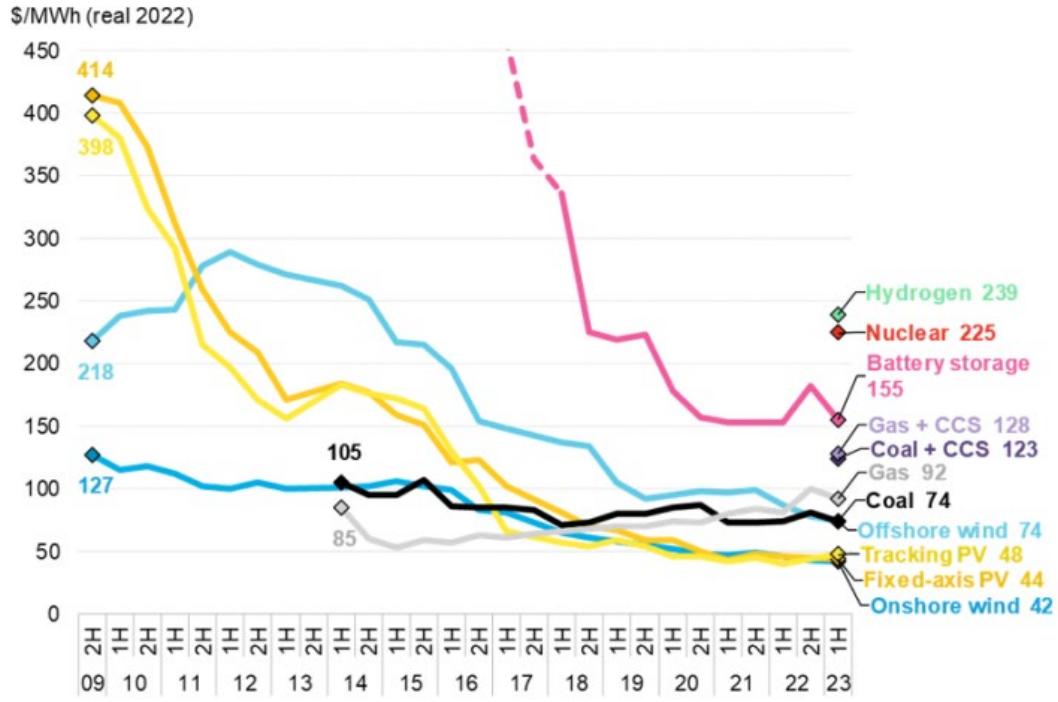
Introduction

Hawai'i is committed to the use of renewable sources to meet its energy needs for three reasons: economics (affordability), environment, and energy security.

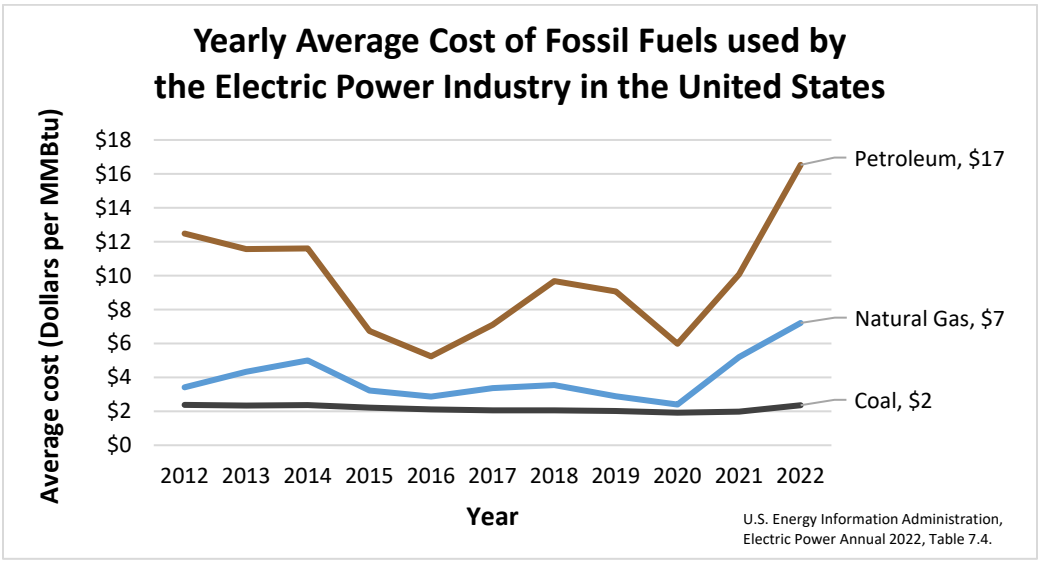
Nationally and internationally, the costs of electricity from renewable resources have declined over the years; now, renewable energy is often the lowest cost source.[1,2]

[1] Bloomberg, https://about.bnef.com/blog/cost-of-clean-energy-technologies-drop...
[2] Lazard, https://www.lazard.com/research-insights/levelized-cost-of-energyplus/

Figure 1: Global levelized cost of electricity benchmarks, 2009-2023



In Hawai‘i, as existing units are replaced and retired, the cost difference of new electricity generation units are even more pronounced, since (as in island and remote areas) petroleum, the most expensive of the fossil fuels,[3] is the fuel most commonly used for electricity generation.



[3] United States Energy Information Administration, https://www.eia.gov/electricity/annual/html/epa_07_04.html

Hawai'i's locally available renewable resources such as solar and wind generate electricity at significantly less cost than low sulfur fuel oil and diesel typically through long term fixed price contracts that blunt the harmful effects of oil price volatility. Hydropower can also economically compete favorably with fossil fuel generation. Recent advances in ocean thermal energy conversion heat exchangers show great promise in making that technology cost effective.

When solar is combined with energy storage (see energy storage section), renewable resources can be shifted to peak power periods to lower the cost of electricity while increasing resiliency and reliability.

The Renewable Portfolio Standard (RPS) remains an effective driving force for Hawai'i's renewable procurement progress with firm oversight by the PUC. HSEO will continue to provide analysis, technical assistance, and project deployment support to developers of utility-scale and customer-sited renewable energy systems as well as other energy stakeholders.

Renewable Portfolio Standard*

Hawai'i's RPS law, Hawai'i Revised Statutes sections 269-91 through 95, serves as a legal mandate to achieve a clean energy economy. First enacted in 2001, the RPS has been modified in subsequent years to reflect and refine Hawai'i's objective to "transition the State away from imported fuels and toward renewable local resources that provide a secure source of affordable energy.[4]"

In 2022, Act 240 (2022) was adopted by the Legislature improved the accuracy of the RPS definition based on electrical generation as opposed to sales. Two fundamental issues that the change corrected are listed below:

1. The previous renewable portfolio standard calculation inflated the reported percentage of renewable energy by excluding customer-sited, grid-connected energy generation in the denominator, which becomes material with higher levels of customer-sited, grid-connected energy generation that is non-renewable; and
2. The previous electrical energy sales number did not include energy losses that occurred between the points of electrical energy generation and the customer meter, where sales are measured.

One study projected that without the change an RPS of 100% may have allowed 21% fossil-fueled generation on the system. The essence of the statutory change is shown below, with the new text underlined and the deleted text between brackets. As now required by HRS section 269-92, each utility is to use renewable energy sources for, at a minimum,

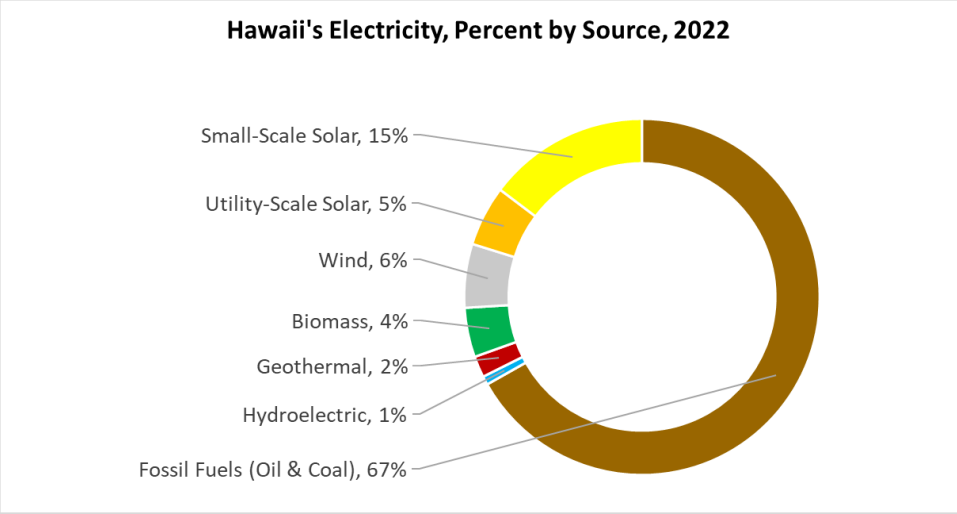
[4] SLH2022_Act240.pdf (hawaii.gov)

(1) Ten percent of its net electricity sales by December 31, 2010;
(2) Fifteen percent of its net electricity sales by December 31, 2015;
(3) Thirty percent of its net electricity sales by December 31, 2020;
(4) Forty percent of its net electricity [~~sales~~] generation by December 31, 2030;
(5) Seventy percent of its net electricity [~~sales~~] generation by December 31, 2040; and
(6) One hundred percent of its net electricity [~~sales~~] generation by December 31, 2045.

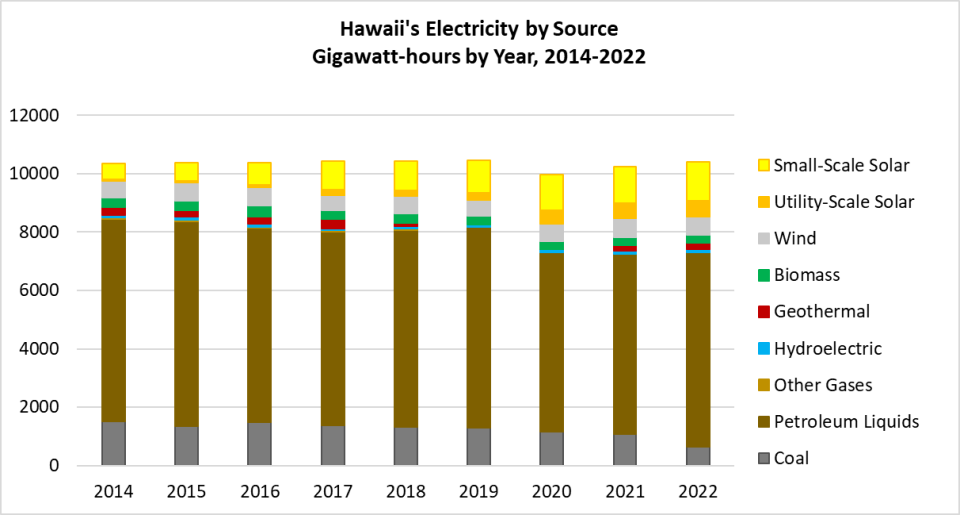
In 2023, utilities reported RPS progress using both the old and the new calculation methods:

Renewable Electricity Generation in Hawai‘i, 2022 Renewable Portfolio Standard (RPS) percentages reported for calendar year 2022	Old RPS calculation method: Renewable ÷ Sales	New RPS calculation method: Renewable ÷ Generation
O‘ahu	34.37%	28.24%
Maui Nui (Maui, Moloka‘i, Lāna‘i)	45.63%	35.63%
Hawai‘i	60.45%	47.87%
Hawaiian Electric Company (combined: Hawai‘i, Maui Nui, O‘ahu)	**39.13%**	**31.78%**
Kaua‘i Island Utility Cooperative	**69.40%**	**60.21%**
STATEWIDE	**40.70%**	**33.17%**

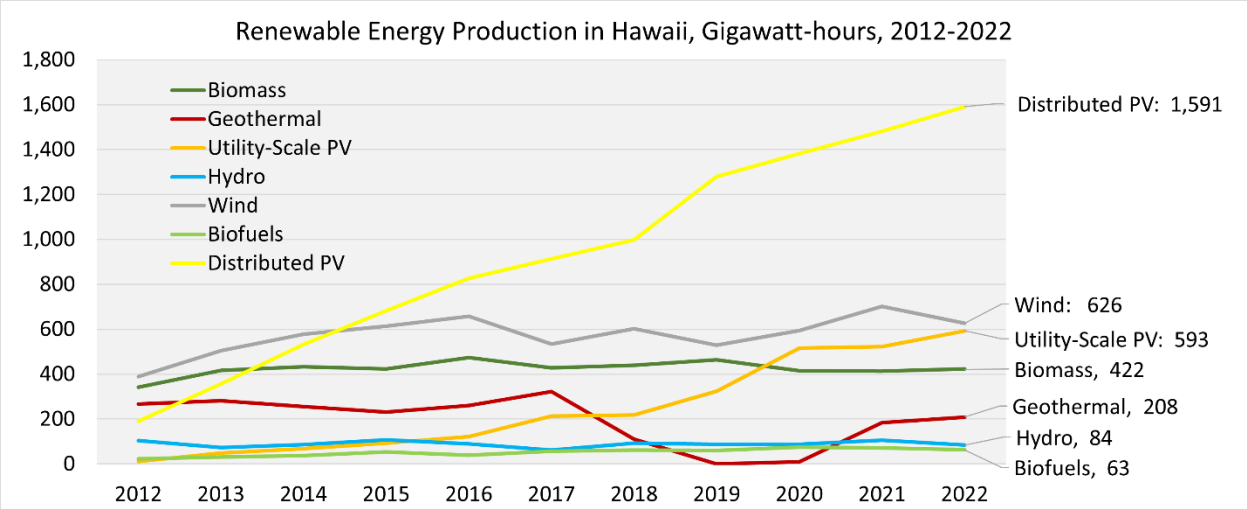
A variety of energy sources contributed to generation of Hawai‘i’s electricity in 2022. As shown by the donut chart, fossil fuels were used to generate two-thirds of Hawai‘i’s electricity. The next largest amount, at 15%, was provided by small-scale solar, followed by wind at 6%, utility-scale solar at 5%, biomass (including municipal solid waste) at 4%, geothermal at 2%, and hydropower at 1%.



The amount of electricity generated by fossil fuels has been declining, and the amount generated from renewable sources has been increasing, as shown in the stacked column graph below. When both utility-provided and customer-generated electricity are considered, demand has remained relatively constant, at about 10 terawatt-hours statewide (10,000 gigawatt-hours) per year.



The changes in renewable electricity production by source, year over year, are shown in the graph below. The fastest growing source was distributed photovoltaics (PV), followed by utility-scale PV. Other sources (wind, biomass, hydropower, and biofuels) have remained somewhat constant over the time period of 2012-2022. Geothermal, which was off-line between May of 2018 and November of 2020 due to impacts of lava flow from an active volcano, returned to full production in 2021.



New renewable energy development

On O'ahu, the scheduled retirement on September 1, 2022, of a 180-MW AES owned and operated coal fired power plant that had over its 30-year contract provided 15-20% of O'ahu' s power highlighted the urgency of timely interconnection of replacement generation. To address the timely substitution of generation capacity vacated by the AES coal plant, the Powering Past Coal Task Force was formed by gubernatorial executive order. During FY22 and FY23, the Task Force proactively identified potential project development delays and swiftly resolved them when feasible. The Task Force concluded its initial mission and established essential channels of communication between developers, agencies, and utilities.

In the latter half of FY23, following the closure of the coal plant and continuing work from the Task Force, HSEO continued to maintain a master schedule of power generation including projects on all islands. The schedule included periodic updates of the timeline of projects and programs approved by the PUC, including utility-scale projects, Community Based Renewable Energy projects, as well as Battery Bonus / Scheduled Dispatch, demand response, and distributed energy resource programs.

In FY23, HSEO also prepared for a greater level of support for a wider variety of renewable energy and storage technologies, including solar, wind, geothermal, bioenergy, hydropower, and ocean energy (including wave and ocean thermal energy conversion, "OTEC"), all of which are included in HSEO's presentations, permitting resources, and public outreach materials.

Project support will continue in FY24, as projects undergoing construction continue towards commercial operation; also, in FY24, the projects that bid in to the third Request for Proposals will be announced and will proceed through contracting, permitting, and Public Utilities Commission approvals.

Market Transformation **Technical Assistance**

Solar

Both utility-scale and customer-sited solar PV generation are needed to meet Hawai'i's renewable energy and electricity affordability objectives. In calendar year 2022 in Hawai'i over 2.18 terawatt-hours of electricity were produced from both utility scale and distributed PV.

In FY23, HSEO provided coordination where necessary for Hawaiian Electric's Stage 1 and 2 projects through meetings with utilities and stakeholders, technical and feasibility review and comment, and evaluation of policies and impacts.

Assistance with distributed solar included permitting support, cost and technical reviews, responses to public inquiries, and providing information and testimony at various venues, including a significant effort focusing on permitting support.

Technical Assistance

Permitting support

HSEO has been actively involved in working with developers and permitting officials to find and create improvements to the approval process for renewable energy. Appropriate siting, knowledge of technologies, resources, locations, and impacts, and finding sustainable solutions to complex issues, are essential to successful public policies and initiatives. The timely permitting of utility-scale renewable energy projects, including environmental review and community support, will be key to meeting the state's decarbonization goals on schedule.

HSEO's online permitting wizard has been updated to reflect current requirements of Federal, State and County permits needed for new projects. HSEO staff has communicated with project developers and officials of the City and County of Honolulu on permitting issues that have hindered the approval process for both utility-scale and customer-sited solar PV generation and batteries and has assisted in researching successful approaches from other jurisdictions. In some areas, improvements recently implemented are expected to shorten the permitting process from months to weeks.

HSEO is currently seeking federal funding to support the systematic review and improvement of utility-scale renewable energy projects, with the aim of facilitating community benefit and support during the permitting process.

Technical Assistance

Onshore Wind

There are currently eight onshore wind farms in Hawai‘i, that collectively produce 626 GWh of electricity.

Concerns with the proximity of wind turbines to homes, schools, and other occupied buildings have prompted calls for revision to County regulations. For example, in FY23 the Honolulu City Council considered increasing the minimum distance between wind turbines and areas zoned for occupied buildings. O‘ahu's current setback requirements are for the setback distance to be equal to the turbine height. HSEO is continuing to review and research the issues, solutions, technologies, and policies in place in other jurisdictions for potential applicability in Hawai‘i.

Community Engagement

Offshore Wind

HSEO is gathering information and keeping up with developments in the costs, technology, policies, impacts, and feasibility of offshore wind as a potential energy source for Hawai‘i. Offshore wind is included in the Pathways to Decarbonization report and was included in a scenario in Hawaiian Electric Company’s Integrated Grid Plan. The potential for interest might increase with new funding mechanisms via the Infrastructure Investment and Jobs Act (IIJA) and Inflation Reduction Act (IRA). The Bureau of Ocean Energy Management has updated HSEO on the latest studies pertaining to offshore wind energy conducted in the region.


Market Transformation

Community Engagement

Geothermal

HSEO has been preparing for funding and technology development and updates that may arise from the IIJA. Additionally, HSEO continues to work with various parties interested in the topic of geothermal energy (both small-scale and large-scale) and moderated a geothermal panel at the Hawai‘i Energy Conference on Maui in May, 2023.

HSEO commits to regular community engagement prior to undertaking any geothermal projects, and during any development, to understand community support or concerns regarding geothermal resources or use in the area.


Market Transformation

Community Engagement

Bioenergy

Bioenergy includes biomass (wood chips and other solid fuels, including municipal solid waste) and biofuels (liquid or gaseous fuels, including biodiesel, sustainable aviation fuel, ethanol, and renewable natural gas).

Biomass and biofuels are both forms of stored energy, since they can be kept for days, weeks, or months, and used when needed. However, these fuels offer small improvements in carbon output over the fossil fuels it is intended to replace. Technological innovation will be required to make biofuels cost competitive with low sulfur fuel oil and diesel in power generation.

The Energy Feedstock Report (page 36) provides updates on energy feedstock activities.


Market Transformation

Community Engagement

Renewable Energy 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. In fiscal year 2023, HSEO collected the forms and issued the certificates required by HRS section 235-110.32. Also, in compliance with the statute, HSEO hereby 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 2022: One (1) facility.

2. The location of renewable fuels production facilities in the state and outside the state that have claimed the RFPTC for calendar year 2022: One facility, in the state, at 16-240 Mikahala Street, Keaʻau, HI 96749.

3. The total amount of renewable fuel by type, in British thermal units (Btu), produced and sold in calendar year 2022:

Type of Fuel	2022 Amount Produced (Btu)	2022 Amount Sold (Btu)	2023 Projected Production (Btu)
Biodiesel	616,158,405,405	558,707,942,361	Not applicable. Credit period for applicant is exhausted

Market Transformation

Grid Resilience, Security & Modernization

Introduction

Hawai‘i understands there is a new normal with wildfires. With clear recognition that Hawai'i's wet and dry periods are more pronounced, Hawai‘i's wildfire risk is on par with threats posed by hurricanes, floods, earthquakes, and tsunamis under our "all-hazards" approach to resilience.

HSEO exerts its energy policy and resilience planning role serving as the primary and coordinating agency for State Emergency Support Function 12: Energy (SESF-12) within FEMA’s National Disaster Recovery Framework, through participation in regulatory proceedings and through coordination of applications for, and administration of, federal grants for resiliency and response planning and investments.

Energy Assurance

HSEO works diligently to ensure the uninterrupted availability and delivery of reliable fuel and electrical energy to support economic recovery and meet the demands of a growing, clean economy. In this role, the Energy Office supports energy assurance through its role as the primary and coordinating agency for State Emergency Support Function 12: Energy (SESF-12). SESF-12 assists the State to respond to and recover from “all hazards,” including hurricanes, tsunamis, volcanic eruptions, wildfires, pandemics, and humanmade threats.

This year, SESF-12 was activated for Tropical Storm Calvin and the devastating wildfires on Maui. During emergency activations, SESF-12 interfaces with energy industry operators to understand the broader energy supply situation, anticipate shortages, and coordinate with other ESFs, industry, and emergency management to address any energy issues. During “blue skies”, SESF-12 provides subject-matter expertise, develops, and maintains the SESF-12 Annex to the State’s Emergency Operations Plan as well as the State’s Energy Security Plan, and develops and participates in training and exercises.

Technical Assistance

Energy Resilience

HSEO has pursued federal funding to invest in and deploy projects that increase energy system resilience and further develop a robust COP. There are many opportunities from annual programs as well as IIJA and IRA funding, and HSEO has had successful applications and awards from the Federal Emergency Management Agency’s (FEMA) Hazard Mitigation Grant Program (HMGP) and Building Resilient Infrastructure and Communities (BRIC) as well as the Department of Energy’s Grid

Resilience Innovation Partnerships (GRIP) and 40101(d) Grid Resilience funding programs.

Working with HI-EMA, HSEO had secured a $600,000 grant under FEMA HMGP to assess the energy supply chain on O’ahu 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. This project (Advance Assistance 1.0) concluded in October 2023. HSEO will receive $450,000 through FEMA BRIC set-aside funding to do the same assessment (Advance Assistance 2.0) for the other counties.

The Energy Office completed the Oʻahu Energy System and Critical Infrastructure Vulnerability and Resiliency Assessment, a FEMA Advance Assistance-funded effort. This assessment of Oʻahu's primary energy supply, distribution, and demand networks and the State's critical infrastructure risks covered electricity, liquid, and gas infrastructure and the dependencies of Community Lifeline Key Customers. Twenty-eight energy hazard mitigation measures were identified in this effort with a five-year implementation plan to improve the resiliency of critical energy infrastructure. The Energy Office has secured funding, pending FEMA approval, for a second analysis phase for Kauaʻi, Maui, and Hawaiʻi counties.

HSEO, in collaboration with HECO, also submitted a successful application to FEMA BRIC's National Competition for three Critical Customer Hubs (CCH) in Windward Oʻahu, bringing in $8.33 million federal dollars to build resiliency into the system. CCHs are areas with several Community Lifeline customers nearby. The local grid can be reconfigured to a microgrid powered by mobile generation, allowing Community Lifelines to continue operating and serving the local community during a longer-duration outage. The CCH project was the first National Competition award for Hawaiʻi.

HSEO was deemed the sole entity for Hawaiʻi to receive, administer, and distribute IIJA Section 40101(d) funding for grid resilience and preventing outages. The program will run for five years and bring over $15 million in investment to the State. The planning work done under both Advance Assistance projects will inform the criteria, metrics, and evaluation of 40101(d) project proposals.

The Energy Office served on the Resilience Working Group from 2019 through 2021 under Hawaiian Electric's Integrated Grid Planning process with oversight by the Hawaiʻi PUC. The Working group considered hurricanes, earthquakes and tsunamis, volcanos, wildfires, and physical and cyber-attacks the greatest threats to grid resilience and recommended a set of resilience measures.

The Working Group emphasized that infrastructure owners and operators must collaborate in close partnerships to coordinate disaster planning and recovery with shared responsibilities between the power companies, key customers, and the government. The final consolidated Integrated Grid Plan Report was submitted to

the Hawai‘i PUC by Hawaiian Electric on May 12, 2023 and is under review by the PUC.


Technical Assistance

Grid Modernization

HSEO, in partnership with KIUC, will receive more than $17.9 million in funding through the Grid Resilience and Innovation Partnerships (GRIP) Program.

Both projects leverage existing power generation equipment with new technology to expand dispatchable renewable energy and support reliable island grid operation, among other benefits. Together, these solutions will enable KIUC to achieve its 100% renewable energy goal within the next ten years.

The projects are scheduled to begin in early 2024, with an estimated completion date in mid-2025.

The GRIP program will partly fund the Utility Solar Grid Forming Technology (USGFT) and Synchronous Condenser Conversion Technology (SCCT) demonstration projects.

Utility Solar Grid Forming Technology (USFGT)

The USFGT project involves an innovative technology application demonstrating a technological solution for expanded renewables dispatch and reliable island grid operation. The project adds battery storage and advanced grid-forming inverters to two existing solar power plants. This will create a hybrid power supply with enhanced dispatchability and greater resource availability and provide critical ancillary services, including frequency regulation, reactive power and voltage control, and operating reserves. The grid regulation service will offer significant regional and community benefits by furthering the capability of the system to accommodate 100% dispatch of renewable generation sources and provide a more reliable and resilient island grid.

The GRIP program will provide half of the total cost-shared project, estimated at $32.5 million, with KIUC contributing the other half of the total project cost.

Synchronous Condenser Conversion Technology

This innovative project adds the grid-forming capability to an existing Port Allen power station generator to accommodate the stable operation of high penetration distributed variable renewable generation on the Kaua‘i electric grid. The project will provide significant regional and community benefits by reducing the likelihood and consequence of disruptive events to the grid and provide a reference case for others' duplication of the conversion technology. This novel use of grid-forming technology in a size grid will demonstrate a replicable solution for local, regional, and interregional grid enhancement and decarbonization.

The GRIP program will provide half the cost-shared project of $3.35 million, with KIUC contributing the remaining half of the total project cost.

Hawaiian Electric was awarded $95 million through the same program to support the company's proposed five-year resilience plan, which includes a slate of initial, foundational grid **resilience** investments as the first phase of a long-term climate adaptation effort.

Clean Transportation

Introduction

Decarbonizing the transportation sector is central to the State's commitment to achieving a clean energy economy no later than 2045. The Energy Office has prioritized efforts supporting transformational investment in Hawai‘i's clean energy economy, such as electrifying government fleet vehicles, providing market signals, developing innovative market offerings, and supporting the buildout of backbone infrastructure. Whenever possible, HSEO seeks opportunities to leverage funding sources to maximize the impact of clean transportation efforts.

Advancing Zero-Emission Vehicles (ZEVs)

The availability of zero-emission vehicles (ZEVs) for purchase and the accessibility of charging stations are significant factors for improving 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 considering any regional subsidies and lower operating costs.

National EV Infrastructure Formula Program (NEVI)

The IIJA provides both formula and competitive program dollars for states to build out ZEV infrastructure. HSEO has supported HDOT in developing an implementation plan required by the NEVI Formula Program. HDOT is implementing the plan to complete the infrastructure deployment along existing Alternative Fuel Corridors (AFCs) with NEVI formula funds and HSEO’s support. Completing the AFCs is an initial step in building out the necessary infrastructure to support the decarbonization of the ground transportation sector.

Technical Assistance

The Charging and Infrastructure Discretionary Grant Program (CFI)

Unlike NEVI, the CFI is a competitive electric vehicle (EV) charging program under the IIJA. Administered by the US. Dept. of Transportation, Federal Highway Administration (FHWA), the program consists of Community Charging and Fueling Program Grants, which prioritizes project locations for community, equity, workforce, and climate benefits and Alternative Fuel Corridor Program Grants, which prioritizes project locations within 1-5 miles of an AFC. HSEO has collaborated with HDOT to develop an application under the Corridor Program. If approved, this would fund a fast charger on Moloka‘i island and use Volkswagen

settlement funds administered by HSEO for the 20% cost match. HSEO and HECO also partnered with HDOT on its Community Charging application under the CFI program to install chargers at nine public libraries statewide.


Technical Assistance

Volkswagen Settlement Activities*

Light Duty Zero Emission Vehicle Supply Equipment

Per 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 charging stations, which may include a mix of Level 2 chargers and DC fast chargers.

The program will focus on locations available to the public at government-owned properties, workplaces or 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. As noted above, HSEO and HDOT applied to fund a NEVI-compliant charger on Moloka‘i to complete the buildout of the corridor. HSEO proposes to use VW settlement funds to provide the non-federal matching share for the program at a maximum of 20% of the total project cost, or $744,884.00, to access roughly $3 million of federal funds. HSEO actively looks to leverage the VW Settlement funds to bring in additional federal and private sector funding and develop partnerships to increase the scale of the impact.


Market Transformation

Diesel Replacement Rebate

HSEO signed a Memorandum of Agreement with the 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 medium-duty diesel vehicles and equipment with zero-emission equivalents. HSEO is responsible for developing and administrating the DRR rebate program, and HDOH is accountable for paying participant support costs to the Diesel Emission Reduction Act (DERA) program beneficiaries for successfully procuring eligible vehicles through the DRR. The program opened on October 29, 2021, and has received numerous applications. HSEO has funds reserved for six projects and has paid out and closed two rebates for electric school buses. This ongoing program receives additional grant funding through the DERA program each year.

Significantly HSEO uses the VW settlement funds to match the annual funds HDOH receives from the EPA through the Diesel Emission Reduction Act for which Hawai'i receive an additional fifty percent matching incentive from the EPA. The result is a program two hundred and fifty percent the size of what the DRR program would have otherwise been.

Market Transformation

Hawai'i Zero Emission Bus Program

HSEO is continuing to work with HDOT, the County of Kaua'i, the County of Maui, and the County of Hawai'i on a program to replace up to 12 MHD diesel buses with battery-electric zero-emission equivalent buses. HSEO, working in collaboration with the partners, leveraging VW Settlement funds with Federal Transit Administration (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 can distribute FTA formula funds from FY 19, 20, and 21 and Low-No grants from 2018 and 2021 towards projects that replace diesel buses with electric buses. The collaboration between agencies and the counties allows for a larger program than what otherwise could have been achieved.

Market Transformation

EV Infrastructure

HSEO has also advocated for the State's energy and decarbonization goals at relevant venues and departments, including the Public Utilities Commission and legislature. HSEO participates in the PUC Docket 2021-0173 related to a $79M expansion of Hawaiian Electric's EV charging network. The company's application is built upon the Electric Vehicle Critical Backbone Study, which HSEO provided input. HSEO participation in the docket includes providing a broad perspective on the federal IIJA NEVI and CFI programs, regulatory programs, legislatively enacted EV charging rebate program, and needed 3rd party capital investments that will be needed to fill the gap in charging infrastructure needs in the 2030 and 2045 timeframes. Given the material gap in charging infrastructure between needed and proposed HSEO advocates for supporting a robust third-party EV charging market in Hawai'i, a stated objective of the HECO application to support the private sector.

Market Transformation

Expanding Transportation Choices

Significant progress has been made on vehicle efficiency standards, but more needs to be made to reduce the amount of energy that is used in Hawai'i to power

transportation. Vehicle miles travelled, or VMT, is one metric used to quantify how much we drive. Since 2000, VMT in Hawai‘i has increased by almost 40%, and in 2022, about 11.1 billion miles were driven in Hawai‘i.

Although both active and shared transportation and electric vehicles help to reduce greenhouse gas emissions and improve local air quality, active and shared modes of transportation have additional benefits. Regarding the need for reducing the energy required for transportation, a simple 100% conversion to electric vehicles will require a significant increase in the land required for renewable energy to power everyone's vehicles. The space required for vehicles includes the roads driven on and where cars are parked at home or when shopping, recreating, and more. This is particularly important in land-constrained places like Hawai‘i, where land might be more efficiently allocated for open space, agriculture, and affordable housing, among other uses.

In addition, active and shared transportation have other co-benefits including:

- Reduced consumer-borne costs like owning and operating a vehicle and residential parking land value.
- Public-borne costs like construction and maintenance of roads and bridges, indirect social and economic costs such as injuries and fatalities, congestion, parking subsidies, and land value costs.

For Hawai‘i to transition to a carbon net negative economy equitably, more investments must be made to improve the transportation infrastructure and services that help encourage people to make more of their trips via walk, roll, bike, and public transportation. HSEO supports the expansion of transportation choices through the following efforts:

Multi-modal Assessment Phase 1 and 2

HSEO was awarded funding by the O‘ahu Metropolitan Planning Organization to conduct a multi-modal assessment. The Phase 1 goal of the O‘ahu Multi-modal Assessment (MMA) is to identify specific land-use and transportation needs and projects to reduce vehicle miles traveled for the island of O‘ahu. In Phase 2, the MMA will take the recommended projects in Phase one and prepare them for inclusion in the Transportation Improvement Program. Phase two will also include the development of quantifiable metrics that can be used in the MPO's project selection and prioritization for the Transportation Improvement Program to improve multi-modal accessibility for people walking, rolling, biking, and using transit.

The study is expected to start in spring 2024.

Technical Assistance

State Government Employee Transportation Demand Management Study

HSEO was awarded funding by the Oʻahu Metropolitan Planning Organization to conduct a State Government Employee Transportation Demand Management Study. The study aims to develop recommendations to increase transportation choices for State Government employees statewide while also increasing the diversity and efficiency of the State's transportation systems. In addition to the federal money awarded to conduct this study, HSEO was awarded US Climate Alliance funds to perform the same study for the neighbor islands, as the Oʻahu MPO funds are only allowed for studies on Oʻahu.

The study is expected to start in spring 2024.

Technical Assistance to Other Government Agencies

Oʻahu Mobility Hub Study

HSEO co-manages the Oʻahu Mobility Hub Study with the State Climate Commission. The study aims to identify possible candidate sites for mobility hubs on state-owned parking lots. A mobility hub is a centralized location that integrates various transportation options and services to facilitate seamless and convenient travel for individuals. The goal of a mobility hub is to enhance connectivity between different modes of transportation, promote sustainable and efficient travel, and improve the overall mobility experience. The scope of the study includes a parking inventory, site suitability analysis and prioritization, typology development, and an implementation guide. During FY 2023, the parking inventory began, a draft of the site suitability and prioritization methodology was developed, and one technical working group meeting with other government stakeholders was held. In the first half of FY 2024, significant progress has been made on the parking inventory, the site suitability and prioritization were completed, one technical working group meeting was held, and the typologies and implementation guide are being worked on. The study is expected to be completed before the end of FY 2024.

Shift Worker Transportation Demand Management Project

HSEO co-project managed the Shift Worker Transportation Demand Management Project (TDM) with the Hawaiʻi Department of Health (HDOH). The project aims to identify transportation solutions for an often-forgotten segment of the population in transportation planning: people who don't work "traditional hours". The project will set the groundwork to prepare to pilot equitable TDM strategies with community consensus and provide valuable input to government agencies. This will help to

ensure that the needs and experiences of communities disparately impacted by greenhouse gas emissions and disparities in access to transportation facilities or services are represented in future TDM programs and that they do not exclude or unduly burden chronically exploited communities.

During FY 2023, HSEO and HDOH reviewed and finalized the literature review of existing TDM supportive strategies and national best practices, pilot site prioritization process, and facilitated three working group meetings to solicit feedback. In addition, two community-based organizations (CBOs) were hired to engage with the prioritized communities. As part of supporting the CBOs, HSEO and HDOH reviewed and provided feedback on a travel trends analysis, survey questions, and public engagement memo, facilitated three meetings with the CBOs, and provided graphic design support. During the first half of FY 2024, HSEO and HDOH reviewed and provided feedback on the CBOs' summary and recommendations report and the final implementation guide.

 **Technical Assistance**  **Community Engagement**

Electric Bike and Electric Moped Rebate Outreach and Engagement

HSEO assisted HDOT in the outreach and engagement for the Electric Bike and Electric Moped Rebate. The purpose of the outreach and engagement was to increase knowledge of the rebate and gain a better understanding of the barriers to e-bike ownership, particularly for those who are low-income, do not own a vehicle, and/or are enrolled in university or college.

There have been a total of 136 participants. In addition to tabling, HSEO distributed flyers to university/college student centers, local e-bike storefronts, libraries, and information about the rebate was featured in the newsletters of other organizations, both governmental and non-governmental. HSEO plans to continue outreach and engagement through the end of the rebate's availability.

 **Community Engagement**

Grant Writing Coordination

HSEO and the State Climate Commission have been coordinating grant writing support for active and shared transportation projects, courtesy of the US Climate Alliance and Hua Nani Partners, with the four counties. During FY 2023, Honolulu and Hawai'i Counties submitted their RAISE grant applications, and Honolulu County was awarded funding for the Ala Pono Bridge. During FY 2024, HSEO will be coordinating grant writing assistance for Hawai'i County to resubmit their RAISE grant application and work with Honolulu, Kaua'i, and Maui Counties to determine whether they are ready to submit any grant applications in the next year.

Technical Assistance Market Transformation

Collaboration

Multistate Zero Emission Medium- and Heavy-Duty Vehicle

HSEO coordinated Hawai‘i’s participation in the Multistate Zero Emission Medium- and Heavy-Duty Vehicle Memorandum of Understanding (MDHD MOU) along with 17 other states, the District of Columbia, and Quebec. The MDHD MOU commits signatories 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.

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 developed 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). The plan was released in July 2022 after public input and stakeholder feedback. It includes tactics such as rebates for medium- and heavy-duty vehicles that HSEO has implemented through the DRR program.

Market Transformation

State Vehicles

HSEO has been working on updating guidelines for State fleet vehicle purchases. This initiative encompasses establishing an exemption process for comptroller notification and developing a dedicated webpage to consolidate all relevant information, complete with an exemption application section.

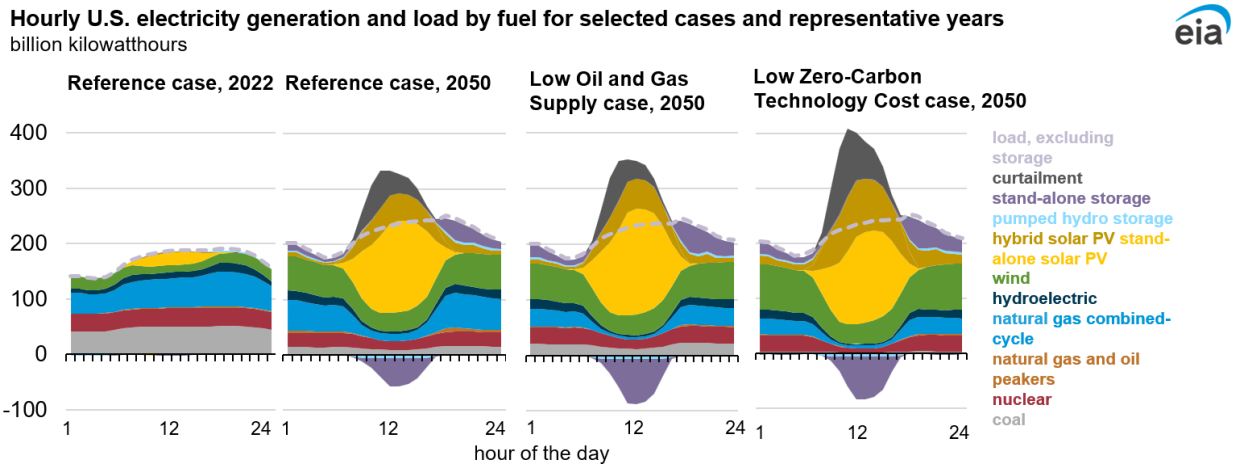
Technical Assistance

Energy Storage Systems

Introduction

As Hawai‘i brings its energy supplies (renewable energy) and energy demand (use of electricity and fuels) into balance, energy storage systems – including synthetic inertia (to balance out momentary fluctuations), batteries and pumped storage hydro (to balance out hourly or daily fluctuations), hydrogen, biofuels, and electro-fuels (for transportation and offsite energy use) and bioenergy (to balance seasonal demands) – are becoming increasingly important.

Hawai‘i is leading the way in many respects. The U.S. Department of Energy’s Annual Energy Outlook for 2023 shows an electricity system reference case in 2050 that has striking similarities to Hawai‘i’s electricity system in the near term.



Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)
Note: Negative generation represents charging of energy storage technologies such as pumped hydro storage and battery storage. Hourly dispatch estimates are illustrative and are developed to determine curtailment and storage operations; final dispatch estimates are developed separately and may differ from total utilization as this figure shows. Standalone solar photovoltaic (PV) includes both utility-scale and end-use PV electricity generation.

Batteries

Batteries are used in both large- and small-scale electricity production to smooth out and provide a balance between electricity production and demand. As of mid-2023 there were over 20,000 customer-sited batteries (with a capacity of over 166 MW) directly supporting more than 100,000 photovoltaic systems in Hawai‘i. There are also several utility-scale projects that include batteries, totaling 690 MWh of storage capacity. The amount of battery energy storage on Hawai‘i’s grids will continue to increase.

Market Transformation

Hydrogen

Hawai'i Pacific Hydrogen Hub*

The Hawai'i State Energy Office convened a group of stakeholders to develop and submit an ultimately unsuccessful $2.1 billion proposal to the U.S. Department of Energy's Clean Hydrogen Hub program.

The Hawai'i proposal aligned existing and new infrastructure to build out a new green regional hydrogen production, distribution, and use network to serve the state and military locations on Guam and Kwajalein Atoll. The Hub proposed to seed a transition to green hydrogen-powered operations across all sectors of Hawai'i's energy ecosystem and economy for the next decade to:

Eliminate price volatility and reduce energy costs and greenhouse gas emissions in high-value transportation, energy storage, and electric power applications;

Serve as the linchpin in accelerating Hawai'i's renewable energy and decarbonization strategy, thus contributing to energy security and national security;

Provide significant net benefits to Hawai'i's diverse communities through green jobs, higher wages, and delivery of reliable, secure, clean, and affordable energy;

Match and phase in appropriate end users from ground-transportation, maritime, and aviation sectors operating locally to ensure supply and demand balance and

Focus on hard-to-electrify or hard-to-abate sectors first, including heavy-duty ground, marine transportation, and aviation.

While it was disappointing not to be selected for inclusion in the national program, HSEO gained considerable knowledge through the process that could accelerate the development of green hydrogen in Hawai'i for use in critical energy resilience applications and heavy-duty trucks and buses. The Energy Office will continue to pursue the development of the most promising opportunities and financial support from other federal funds and available resources.

 **Market Transformation**  **Community Engagement**

Bioenergy, Biomass, and Biofuels

Energy Feedstock Program*

Fuels, as forms of stored energy, are essential parts of Hawai'i's current energy systems and are important to Hawai'i's energy future as well.

The Energy Feedstock Program (HRS section 141-9) requires both HSEO and the Hawai'i State Department of Agriculture to "maintain cognizance of" local

developments in the area of energy feedstocks and report to the Legislature. This section is provided in compliance with the statute.

Energy feedstock activities in the state in FY23 included aviation fuel, feedstock, crop research, economic feasibility, and land suitability studies by the Hawai'i Natural Energy Institute; feedstock work, fuel production, and fuel distribution by Pacific Biodiesel; use of biomass for power production by the Mahipapa facility on Kaua'i; development of a facility by Aloha Carbon to convert locally-generated wastes into organic fertilizer and renewable power; continued use by Hawai'i Gas of methane from the Honouliuli Wastewater Treatment Plant for use in the utility gas product delivered via pipeline on O'ahu; and continued interest in oilseeds by Terviva. Since fuel production may be more cost-effective when using materials left over from the manufacture of other higher value products (food, feed, pharmaceuticals, cosmetics, etc.), it is not necessary for crops to be dedicated to energy production in order to be relevant as potential energy feedstocks.

The Hawai'i Natural Energy Institute continued work on numerous alternative fuels projects, including as a member of the Federal Aviation Administration's (FAA) Aviation Sustainability Center (ASCENT) team, conducting research on feedstocks and technologies for the production of sustainable aviation fuels. Potential feedstocks include construction and demolition waste streams, Leucaena, Eucalyptus, Pongamia, Kukui, Kamani, Sorghum, Banagrass, Jatropha, and others. Pongamia shows promise and was studied further. Technical production potentials were calculated, by island, and compared with annual jet fuel demand (as of 2018). The highest potential was (generally) from trees, with the technical sustainable aviation fuels potential on Maui at nearly 20%; on Kaua'i, over 40%; Hawai'i, 100%; and O'ahu, less than 2%.

The only biodiesel producer in the state, Pacific Biodiesel, uses a combination of used cooking oil and oils from sustainable agriculture to support its annual production of nearly 6 million gallons biodiesel on Hawai'i Island. In 2023, the company began a project to demonstrate biodiesel produced in Hawai'i (on Kaua'i) from locally grown oilseed cover crops. This project builds upon Pacific Biodiesel's previous research in its Hawai'i Military Biofuel Crop Project (2011 to 2015). According to Pacific Biodiesel, plantings for the 2022 and 2023 harvest seasons continued year-round with regenerative farming practices including efficient center-pivot irrigation utilizing surface water, low-till practices, rotational cover cropping (to sequester carbon and improve soil health), and no herbicides or pesticides.

Pacific Biodiesel also makes its fuel available to wholesale and retail purchasers. With U.S. Department of Agriculture grant funding, Pacific Biodiesel installed several off-grid biodiesel fueling stations. With support of the Hawai'i Board of Land and Natural Resources, the first station was installed at the Ma'alaea Harbor on Maui in June 2022, the second station was installed at Honokōhau Small Boat Harbor on Hawai'i Island in July 2022, and the third station was installed in Kahului, Maui in November of 2022. All of these stations offer both on-road and off-road fuel, with

the harbor stations providing access for diesel powered marine vessels, including tour boats, to fuel up with local biodiesel.

The Mahipapa biomass-to-energy facility on Kauaʻi was purchased from the Green Energy Team by Mahipapa, LLC, a project of Pacific Current, on July 1, 2022. The facility is powered 100% by eucalyptus wood chips. According to the Energy Information Administration (EIA), in the calendar year 2022 (the most recent data available), the facility used about 102,000 tons of wood to generate 52 gigawatt-hours of electricity for use by Kauaʻi Island Utility Cooperative.

The production of electricity from waste (primarily municipal refuse derived fuel) continued at H-POWER on Oʻahu. According to the EIA, in calendar year 2022 (the most recent data available) the facility used over 678,000 tons to generate about 366 gigawatt-hours of electricity.

Renewable natural gas continues to be produced by Hawaiʻi Gas at its renewable natural gas facility using biomethane from the City and County of Honolulu's Honoʻuliʻuli wastewater treatment plant. Renewable natural gas produced at the facility is injected into the existing Hawaiʻi Gas pipeline and mixed with synthetic natural gas, produced from petroleum by-product naphtha, to serve Hawaiʻi Gas customers. According to the annual report filed by Hawai'i Gas, "In 2022, Hawai'i Gas upgraded 288,734 therms of biogas to biomethane from the Honoʻuliʻuli WWTP Biogas Project. Hawaiʻi Gas and the City & County of Honolulu are also in the process of extending the contract from December 31, 2024 to December 31, 2034." A contract extension would be subject to approval by the Public Utilities Commission.

In FY 2023, progress was made on a project by Aloha Carbon to convert several types of organic wastes (invasive species biomass from landscape restoration and fire break activities, landscaping and tree trimming waste, wood from construction and demolition) into gasification-compatible feedstock, to make energy and products such as organic fertilizer in a Sustainable Materials Recovery & Fertilizer Facility. This builds upon a previous award of a Federal Small Business Innovation Research Grant to the company to gasify biomass waste into green hydrogen and sustainable aviation fuel. Recent articles and postings indicate continued progress by Terviva in developing Pongamia for use in food production.

Although not energy feedstock per se, in May, 2023, Par Hawaiʻi received approval from the U.S. Department of Commerce to use renewable feedstocks to produce renewable fuels, to include renewable diesel, sustainable aviation fuel, and naphtha, at the refinery.[5] In addition, many other projects and discussions occurred regarding crops and wastes that could be directed to the production of energy; and interest continued in forest biomass, soil carbon, and carbon sequestration.

[5] https://dbedt.hawaii.gov/blog/23-19/

Energy Sector Governance

Introduction

Effective energy sector governance serves as the linchpin for shaping energy policies, fostering transparency, and mitigating risks. Simultaneously, ensuring equitable access to clean energy resources is a moral and socio-economic imperative, addressing issues of poverty, social inequality, and environmental justice.

HSEO, by statute, promotes policies and practices to support energy efficiency, renewable energy, and clean transportation. This includes the critical support functions required to implement these activities throughout Hawai‘i’s economy. Workforce development, community engagement, data collection and analysis, and regional partnerships are essential to achieving Hawai‘i’s equitable clean energy future.

U.S. Department of Energy in Hawai’i*

The historic U.S. Department of Energy and Hawai‘i clean energy partnership has provided human and financial resources and technical assistance that has effectively established Hawai’i as a national leader in decarbonization and renewable energy policy and deployment.

In 2023, incoming HSEO Chief Energy Officer Glick engaged leaders in academia, state government, and the U.S. Department of Energy to jointly develop a conceptual structure and agenda for a regional resilience and energy security focused accelerator for energy transition. With the working title of “Pacific Resilient Energy Security Transition Accelerator” or PRESTA, the idea for a joint state-university-US Department of Energy-supported technical assistance center to catalyze and accelerate optimal energy restoration of Maui and replicable energy security transitions throughout the Hawaiian archipelago was initiated. PRESTA is envisioned as a cross-disciplinary team of dedicated and localized human resource capacity in finance, economics, policy, and engineering to design and manage energy transitions from feasibility to deployment, supplemented by the national laboratories.

Advancing decarbonization in the integrated energy ecosystem (electrical grid and transportation infrastructure) requires sustained support to achieve sustainable transformation in the integrated business system chain. Difficult challenges that require multi-disciplinary, sustained collaboration between government and academia under PRESTA would initially focus on the following:

1) Options for Post Maui Wildfire energy system design and energy transition acceleration.

2) Reducing the average renewable energy project approval timeline from five to three years.
3) RE/BESS management design and demonstration facilities for Li-ion and PV panel waste streams.
4) Accelerating the pace of renewable integration in low inertia grids.
5) Resiliency hub energy self-sufficiency.
6) Energy-resilient ports/shipping corridors.

The HSEO Chief Energy Officer presented the PRESTA agenda to the Deputy Secretary of Energy in February and July of 2023 and had follow-up meetings with the Director of the U.S. Department of Energy's Office of State and Community Energy Programs on potential USDOE funding for PRESTA. The ongoing dialogue with USDOE fulfills the objectives of HCR 17 (2023), in which the Hawai'i House of Representatives requested HSEO to engage the USDOE regarding a permanent presence in the state, and to report "on the status of the engagement and the terms of any proposed agreement."

In addition to permitting and community acceptance, HSEO and USDOE are engaged in continued dialogue on the following energy transition priorities:

- Pumped Storage Hydroelectric development.
- Carbon sequestration resource characterization and development.
- Geothermal electricity resource characterization and development.
- Geothermal air conditioning feasibility and education.
- Wayfinders program development and potential as a national model.
- Net zero energy ready building codes adoption and enforcement.
- State building energy efficiency.
- Community solar, especially how to benefit low-income households and renters.

 **Market Transformation**  **Technical Assistance**

Decarbonization Pathways Study

The 2022 Legislature directed the Hawai'i State Energy Office to "determine Hawai'i's pathway to decarbonization and identify challenges, opportunities, and actions that will be needed to achieve those goals."

HSEO has contracted with an outside consulting firm and the National Renewable Energy Laboratory to develop and run scenarios that explore different pathways to 2045. The outcomes will provide policymakers with data to understand various options' economic and societal impacts, including environmental justice considerations related to frontline and low-income communities.

HSEO gathered input from critical stakeholders statewide and held webinars to inform the public of its progress. The final report will be submitted to the Legislature 20 days before the start of the session.

 **Community Engagement**  **Market Transformation**

Workforce Development

Recognizing the strong connection between community involvement and workforce development, in July 2023 HSEO established a new Jobs and Outreach Branch (JOB) focused on these two priorities. HSEO is investing in a sustainable energy workforce ecosystem to meet the needs of Hawai'i laborers and industry while creating pathways to living wage jobs and careers in some of our most economically distressed and climate-vulnerable rural and urban communities. The lack of quality career opportunities has caused many of Hawai'i's young and experienced talent to seek careers out of state. In response, Hawai'i's public and private leaders have invested in workforce development for high-demand industries, including clean energy and transportation.

HSEO's workforce development efforts are focused on:

- Keiki to career education and development
- Partnerships
- Leveraging existing Hawai'i resources and programs
- Maximizing federal funds
- Employer-lead identification of workforce development priorities
- Developing new programs through UHCC or other partners
- Enabling job placement and advancement including internships, externships, and apprenticeships (e.g., Hawai'i Department of Labor and Industrial Relations Registered Apprenticeships program)

Good Jobs Hawai'i

HSEO is the clean energy and skilled trades sector lead under the Good Jobs Hawai'i (GJHI) initiative launched in January 2023; a statewide coalition of over 70 employers, training providers, community-based organizations, and key stakeholders focused on developing systemic workforce solutions to ensure quality jobs in strategic economic sectors. GJHI is led by the University of Hawai'i Community Colleges (UHCC) and the Hawai'i Chamber of Commerce and is funded by various philanthropic and government partners, including the U.S. Department of Commerce - Economic Development Administration, U.S. Department of Education, and the Hawai'i Workforce Funders Collaborative. GJHI is focused on developing "good" quality jobs and careers in four recession-resilient sectors in Hawai'i, including clean energy.

As the lead for the clean energy and skilled trades sectors, HSEO has allocated $250,000 for an energy Training Specialist who started on December 1, 2023.

HSEO is responsible for convening large local employers in these sectors and getting their input on the skills and certifications they desire or require for current job openings. These needs are then communicated to UHCC, which can develop courses and curricula to meet these needs or partner with third-party training providers. GJHI's training includes Solar Certificate NABCEP, Solar Safety Training OSHA-10, commercial driver license, forklift, Automotive Service Excellence (ASE), welding, chainsaw safety, and carpenter pre-apprentice courses. Trainings under development through GJHI include International Brotherhood of Electrical Workers (IBEW) apprenticeship exam preparation, Electric Vehicle Infrastructure Training Program (EVITP) and battery energy storage systems for IBEW members, Certified Energy Manager, and GED/ high school equivalency.

GJHI metrics for the clean energy and skilled trades sectors as of November 2023:

- Clean Energy / Skilled Trades Trainings Offered: 75
- Clean Energy / Skilled Trades Trainings Started: 66
- Clean Energy / Skilled Trades Participants : 464

Clean Energy Sector Partnership

As part of GJHI, HSEO, in partnership with UHCC, Hawai‘i Chamber of Commerce, SMS Research, and other vital partners, established a new Hawai‘i Clean Energy Sector Partnership (CESP) in May 2023. This Sector Partnership is an industry-led group of employers, educators, and community organizations that strives to identify in-demand entry-level positions and develop career pathways for these positions, identify desired skills and training resources, provide on-the-job training, and support overall employment and career advancement. Through the CESP, HSEO partners with employers to identify in-demand entry-level occupations, develop career pathways from entry-level jobs, desired skills training, provide on-the-job training, and entry-level employment.

The CESP Steering Committee met four times in 2023, and the first Full CESP meeting was in October 2023. More than 80 local industry leaders and community partners learned about the CESP and GJHI. They identified training needs and priorities in the sector that can be pursued through GJHI and other resources available in Hawai‘i.

In December 2023, HSEO issued a Request for Interest (RFI) for the USDOE Home-Based Energy Efficiency Contractor Training Grant. Through this grant, HSEO is allocated $1,194,820 to train local energy efficiency contractor employees to ensure there is a sufficient qualified workforce to install the energy efficiency technologies available for subsidies from USDOE; specifically, the $68 million in Home Efficiency Rebates and Home Electrification and Appliance Rebates allocated to Hawai‘i under the Inflation Reduction Act. In addition to training the workforce, HSEO will also be

responsible for administering Hawai‘i’s rebates under these programs. The RFI is intended to identify potential partners and training programs to be pursued through this grant. The CESP has identified energy efficiency training priorities, which will help inform the training developed and provided under this grant.

Workforce Development

Energy Education and Keiki-to-Career Pathways

Workforce development and education start at a young age. Hawai‘i's youth must know the promising careers in Hawai‘i's energy fields, the required knowledge, and skills to enter the workforce, and the available resources to support their career development. HSEO has increased its capacity to guide Hawai‘i’s next generation of clean energy leaders by providing technical support and engagement capacity for a variety of programs. In 2022, HSEO in collaboration with HIDOE contracted the Maui Economic Development Board to develop and publish clean energy curricula and toolkits to train teachers in primarily Title I K-12 schools in Hawai‘i. These publicly-available resources empower teacher, student, and family participation in Hawai‘i’s transition to a decarbonized economy. Over 150 teachers and 8 trainers at 80 Title 1 schools were trained on these materials so they may implement clean energy learning into their individual curriculum and train additional teachers in the future. The curriculum has reached over 9,500 students statewide as of the closing of the initial project period in July 2022. HSEO has funding allocated for further development of the curriculum.

In addition, HSEO serves as an Industry Representative on the Hawai‘i Department of Education (HIDOE) Career and Technical Education (CTE) Energy Pathway Advisory Council and Energy Pilot Project Team which provides a framework for incorporating career exploration into high school curricula. The Energy Pathway was developed with the support of industry, teachers, and administrative representatives and launched its pilot in the 2023-2024 school year with James Campbell High School, Kapolei High School, and Kealakehe High School. The Energy Pathway includes three Programs of Study – (1) Renewable Energy Technologies, (2) Alternative Fuels Technologies, and (3) Power Grid Technologies – each leading with a Foundations of Energy course in the first year followed by three subsequent courses. HSEO supports HIDOE’s CTE program through identification of industry standards and relevant certifications, curriculum development for individual teachers, coordination with employers in Hawai‘i’s energy industry to provide career exposure opportunities, and in-class on-campus engagement.

Workforce Development

Stakeholder Outreach and Engagement

Energize Kākou and Community Outreach

In 2022, HSEO developed a community education, outreach, and engagement program entitled Energize Kākou-(together). The program engages and coordinates energy stakeholders to increase community awareness about, engagement in, and access to decision-making for Hawai'i's shared energy future. By facilitating collaborative government and private sector energy policy and project development decision-making throughout Energize Kākou, HSEO proactively addresses critical community stakeholder concerns and aspirations to achieve socially and environmentally just and equitable progress toward decarbonization. Energize Kākou is an expansive, iterative program developed in partnership with statewide community representatives that includes a Cultural Narrative, a Playbook, and a Strategic Work Plan along with a user-friendly website and the ground-breaking Clean Energy Wayfinders community-based informational resource and workforce development program. HSEO has a budget of $100,000 from USDOE (State Energy Program) to expand its outreach efforts under Energy Kākou in 2024, which could include additional meetings or workshops, and the development of informational materials for the public.

Community Engagement

Energy Equity Hui

HSEO currently leads Hawai‘i’s Energy Equity Hui (EEH), a statewide public-private collaborative network of individuals and organizations working towards an equitable clean energy transition. The EEH has created working groups focused on actionable initiatives, including Community Benefits, Renewable Request for Proposal Improvements, Equity Frameworks and Definitions, Energy Equity Legislation, and EEH Strategy. The primary outcomes of the working groups to date are letters to the PUC detailing research, case studies, and recommendations for the following steps to improve energy equity issues in Hawai‘i and the relationship between community and energy.

The PUC opened the Energy Equity and Justice Docket (EEJD) in 2022 to investigate how to better integrate equity and justice considerations across Commission proceedings and the Commission’s work more broadly, including in its role overseeing and regulating the functions of public utilities. HSEO’s participation in the EEJD is valuable as it informs priority equity needs that can guide other HSEO initiatives, e.g., Energize Kākou, Wayfinders, and Energy Equity Hui.

Community Engagement

Strategic Pacific Region Relationships

Much can be learned and leveraged by working with other small island developing states (SIDS) and nations in the Pacific regarding climate and clean energy issues, as similarly faced in Hawai‘i. In 2023, HSEO expanded its connections with other Pacific Island nations such as Sāmoa, Palau, Rapa Nui (Easter Island), Aotearoa (New Zealand), and Australia. The Office has recently made other connections with The Kingdom of Tonga, Pohnpei (Federated States of Micronesia), and the Marshall Islands. HSEO will also continue to foster ties with these nations and reach more than the ones listed above. HSEO hopes to convene a meeting next year in congruence with these collaborations with these SIDS and nations.

HSEO and the Okinawa Prefectural Government continue to support the Hawai‘i Okinawa Clean Energy Task Force and Workshop. In-person convenings resumed in late 2022 with a meeting in Naha, Okinawa, and continued in mid-2023 with an event held at the University of Hawai‘i – Mānoa campus.

HSEO serves as a Non-Voting Government Member of the Hawaiian Islands Humpback Whale National Marine Sanctuary Advisory Council (SAC) and helps to inform the SAC on ocean-related energy matters, namely offshore wind. HSEO also supports the Ocean Resources Management Plan administered by the Hawai‘i Office of Planning and Sustainable Development.

Community Engagement

Clean Energy Wayfinders

HSEO’s Clean Energy Wayfinders is a nation-leading program that places trained individuals in targeted Hawai‘i communities throughout the state who engage, empower, and inform communities on energy and transportation matters. Hawai‘i’s rich cultural and historical tradition of wayfinding in which trained navigators help lead their communities to a new place where they can sustain a better quality of life inspires the Wayfinders’ approach to community engagement. The Wayfinders share information and opportunities for participation in the clean energy transition with Hawai‘i's schools, community organizations, and households — especially those in low- to moderate-income (LMI), asset-limited, income-constrained, employed (ALICE), 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, promote green career training and employment opportunities, and raise awareness about the renewable energy policymaking and regulatory process. Kupu Hawai‘i currently administers the Wayfinders through the Kupu 'Āina Corps Program approved by the Hawai‘i State Legislature.

The Wayfinders program is highlighted in USDOE's General Guidance for Justice40 Implementation, and USDOE and other state energy offices have approached HSEO about implementing similar programs in other jurisdictions.

Cohort 1 of the Wayfinders ran from September 2022 to September 2023 and consisted of eight Wayfinders on Kauaʻi (1), Oʻahu (3), Molokaʻi (1), Maui (1), and Hawaiʻi Island (2). Cohort 2 runs from October 2023 to October 2024 and consists of six (6) Wayfinders based on Kauaʻi (1), Oʻahu (2), Molokaʻi (1), Maui (1), and Hawaiʻi Island (1). Both cohorts were funded by the USDOE Energy Efficiency and Conservation Block Grant (Kupu host site administration fee) and the American Rescue Plan Act through Kupu ʻĀina Corps (Wayfinder wages and benefits).

The Wayfinders program has found success in its first full program year. The Wayfinders have participated as attendees or hosts in over 80 community events, including Neighborhood Board meetings, farmers markets, community fairs, school classes, and town hall meetings. Through these events the Wayfinders have engaged over 1500 individuals, meeting the community where they are to listen to their energy concerns and priorities, share relevant energy information and program referrals, and help get more people engaged in their local energy conversations.

In 2023, HSEO partnered with the University of Hawaiʻi Sea Grant College Program to train the Wayfinders to support their outreach activities. This project aims to develop an extension program through a collaboration between Sea Grant and HSEO focused on sustained dialogue and relationship building between island communities across Hawaiʻi and HSEO in informing the state's energy future. Funding for this project ($400,000) comes from the National Oceanic and Atmospheric Administration (NOAA). Professional development for the Wayfinders is essential to their role representing HSEO and their professional development. UH Sea Grant will contract with select community organizations through this project to conduct outreach and education on coastal energy matters. This model leverages the relationships and expertise of community-based groups and builds their capacity beyond the project period.

In August 2023, HSEO submitted a pre-award application for $1,000,000 in federal funding from U.S. Congress to expand the Wayfinders program and increase HSEO’s capacity for technical assistance to communities, local regulatory agencies, developers, and others engaged in Hawaiʻi’s energy transition. HSEO is evaluating extending the existing Wayfinders program in its current form or contracting with community organizations to build community capacity. The expected outcomes are to increase HSEO's professional engagement in community benefits discussions and activities; increase community access to energy efficiency, renewable energy, and clean transportation resources; increase immediate and long-term employment opportunities as a result of market expansion; and accelerate progress toward the state's decarbonization goals as set by statute.

Technical Assistance Community Engagement

Sponsorships

One of the strategies HSEO employs to fulfill its mission is the sponsorship and partnership of programs that align with HSEO's mission to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient, clean energy economy. In February and November 2023, HSEO issued separate competitive solicitations seeking applications for programs that increase awareness and support of Hawai'i's clean energy goals. The type of programs that may be sponsored may include, but are not limited to, educational events/programs, workforce development events/programs, conferences/summits, seminars, workshops, and trade fairs. Funding for this initiative comes from the USDOE State Energy Program.

Sponsorships from the previous fiscal year (February 2023) were awarded for: Blue Planet Foundation's Sustainable Transportation Coalition of Hawai'i ($3,500), Clean Energy Education ($2,000), Climate and Clean Energy Webinars ($1,000); Hawai'i Bicycling League Bike Month ($8,800); Hawai'i Climate Change Mitigation and Adaptation Commission Climate Fairs ($8,950); Hawai'i Green Growth UN Local2030 Measures Working Group ($8,300), KHON Living 808 ($9,989); Maui Economic Development Board Hawai'i Energy Conference ($3,000); and, Renew Rebuild Hawai'i Webinars ($3,500).

Community Engagement

Data Analytics and Visualization

HSEO is committed to building trust among stakeholders as we progress towards our clean energy goals. To support this, HSEO is actively involved in various initiatives related to data analysis. High quality analysis and visualizations improve understanding of the underlying data, increase engagement with modeling outcomes, and are a resource in decision making.

Engage Energy System Modeling

Engage is an open access, publicly available web application for energy system modeling developed by HSEO in collaboration with the National Renewable Energy Laboratory with funding support from the U.S. DOE. It can be used to explore decarbonization strategies such as one hundred percent electrification of ground transportation as well as progress in aviation and marine transportation sectors. Base models and scenarios were developed for all islands for the Act 238 Decarbonization Study to analyze alternative pathways. To provide transparency and consistency with regulated utility resource planning proceedings the Engage model was benchmarked to the modeling conducted in HECO's Integrated Grid Planning proceeding. The purpose was to ensure that based on similar assumptions the Engage model came up with reasonably similar results and, as necessary,

explain any differences in the modeling algorithms that could lead to different solution sets. As noted in the executive summary HSEO is working with OMPO on their ORTP to translate the transportation planning scenarios into energy system requirements of those scenarios to highlight the impacts the transportation scenarios could have on topics such as land requirements for renewable energy deployment. With the analytical capacity enabled by Engage, HSEO will continue to work to integrate energy planning with planning of interdependent sectors such as transportation to support holistic policy analysis as well as provide input in utility regulatory proceedings on issues that could warrant detailed analysis conducted in those dockets.

 **Technical Assistance**  **Community Engagement**

Hawai'i Advanced Visualization Energy Nexus (HAVEN)

Visualization tools provide the opportunity to explain the outcomes and tradeoffs analyzed in energy system modeling and studies to stakeholders beyond the energy sector. With the size of energy investments, in both capital and physical scale, it is essential that energy planning discussions embrace a broader audience including communities that energy serves and communities where energy resources are sited. Tools such as HAVEN, developed in collaboration with University of Hawai'i's Laboratory for Advanced Visualization and Application (LAVA) through U.S. DOE funding, provide an approachable representation of the tradeoffs of alternative energy scenarios to spur meaningful conversation on significant conversations on large capital and physical investments.

HSEO is working with LAVA and fellows from the University of Hawai'i's Data Science Institute to both conduct energy system analysis and to build on HAVEN technology to support engagement with decision makers such as legislators and impacted communities through HSEO's JOBS branch. HSEO collaborated with the data science fellows to develop an updated implementation of HAVEN on HSEO's in-house AWS Cloud infrastructure, continue to mature existing Tableau data visualization capabilities, and strengthen foundational data pipelines. It is worth noting that federal grants prioritize applications with community engagement plans and HSEO has created a branch to engage communities. HAVEN and other visualization tools support JOBS staff conducting community engagement.

 **Technical Assistance**  **Community Engagement**

O'ahu Energy System Visualization

In collaboration with LAVA, HSEO has been working on the creation of an educational Virtual Reality (VR) platform focusing on O'ahu's energy infrastructure. The project involves the meticulous 3D documentation of existing energy facilities

across the island, encompassing refineries, solar and wind farms, energy storage installations, waste-to-energy facilities, and a hypothetical offshore wind farm.

Utilizing state-of-the-art VR technology, the objective is to furnish a comprehensive educational resource for both the public and legislative stakeholders. The immersive VR experience will enable users to virtually observe these facilities from both fixed vantage points and birds-eye flyover views. The VR platform wil help provide a better understanding of the O'ahu Energy System and what proposed energy infrastructure looks like within surroundings that residents are familiar with. The intent is to foster a heightened awareness and comprehension of O'ahu's current energy landscape.

The development of this VR platform aligns with the mission of the HSEO to enhance public understanding of complex energy systems and supports outreach and engagement activities conducted by the JOBS branch. By delivering a visually engaging and informative tool, the initiative seeks to contribute to the collective knowledge base, empowering stakeholders to make informed decisions regarding the sustainable energy future of O'ahu. As we continue to expand the coverage of documented facilities, including potential future developments, the VR platform is poised to be an instrumental resource for ongoing public and governmental education on energy-related matters.

Energy Data Portal

HSEO hosts a single source repository for energy related data to provide a solid foundation for a data-informed approach to achieving the State's energy goals. It serves as a one-stop-shop for reliable state energy data, and to ensure energy policies and regulations align with the state's clean energy goals. HSEO is working with fellows from The Data Science Institute at The University of Hawai'i to maintain and extend data sets from public and private sector sources. The Data Portal includes both source data and curated data sets which integrate multiple data sources. Curated data sets are valuable in a few ways. Some data sets, "big data", are so large that they can be difficult to process and digest into meaningful information from which to conduct analysis. Curated data sets take the "big data" and make it actionable for analysts to use. Curated data sets can also provide greater access to information that would otherwise be confidential. HSEO has experience with, and access to, confidential information. By linking and processing the data HSEO can anonymize the data set provided while protecting underlying personal identifiable information (PII) and protected critical infrastructure information (PCII).

Stakeholders and interested citizens can easily view and interact with data to become better educated and informed about Hawai‘i’s energy landscape and the state’s progress towards its clean energy goals.

 **Technical Assistance**  **Community Engagement**

Energy Program Administration and Funding

Introduction

HSEO operates under a working organizational structure with statutory responsibilities assigned to branches given the integrated nature of the statutory objectives and activities. The formal reorganization of HSEO pursuant to Act 122, Session Laws of Hawai'i 2019, has been initiated.

Act 122 established the following mission for HSEO: "The purpose of the Hawai'i 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 reorganization will incorporate Act 122 and the flexibility of exempt positions into five groups:

- Administration (Admin),
- Operations (Ops),
- Jobs and Outreach Branch (JOBS),
- 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.

Act 248, Session Laws of Hawai'i 2022, appropriated $2,216,673 in FY23 General Funds for HSEO's positions and operating costs. The position ceilings allocated by Act 248 included 1.00 permanent position and 27.00 temporary positions. $565,000 in Special Funds was appropriated from the ESSF to provide funds to leverage federal grant fund and to pay special fund assessments.

Act 238, SLH 2022 appropriated $350,000 in FY23 out of the ESSF for HSEO to analyze pathways and develop recommendations for achieving the State's economy-wide decarbonization goals. HSEO has contracted for the necessary analysis and technical support to inform regulatory or other state action to ensure the State's decarbonization goals are met. The analysis shall inform the determination of

cost-effective pathways and help to rank the recommendations based on levels of impact, cost, and ease of implementation.

To provide adequate staffing for HSEO activities and programs, three temporary 100% federal funded positions were established and filled during FY23. Although not sustainable, the positions are essential to fill critical ongoing needs.

- An Energy Training Specialist position was established to focus on coordinating activities for the backbone and lead organization in the Clean Energy and Skilled Trades sector of the Good Jobs Challenge. Over the course of this grant, the Specialist will work with the University of Hawai‘i Community Colleges (UHCC), industry associations, employers, service providers, trainees, community-based organizations, and others to develop and implement effective and high-impact career and technical education and workforce training that meets the needs of the Clean Energy and Skilled Trades sector which includes energy efficiency, conservation, renewable energy, and clean transportation.
- A Special Projects Manager was hired to direct and coordinate the development and submittal of the Hawai‘i Pacific Hydrogen Hub Full application in response to the Letter of Encouragement from the USDOE Clean Regional Hydrogen Hubs funding opportunity.
- A Decarbonization Program Manager was hired to lead the development of the state’s first economy-wide decarbonization strategy, which in accordance with Act 238, will “analyze pathways and develop recommendations for achieving the State’s economy-wide decarbonization goals” and other decarbonization plans.

Administration

HSEO’s administration is supported by the Operations team which 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 actively seeking and tracking federal funding opportunities for grants that present viable funding and align with HSEO goals and priorities. It ensures 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 team also assists the public by processing Uniform Information Practices Act (UIPA) requests for government records. The administrative team develops and implements processes and procedures to facilitate and expedite the work of the entire office.

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 FY23, ESSF revenue from the Environmental Response, Energy, and Food Security Tax (“Barrel Tax”) was $1,263,373. The projected annual accrual of this fund at 4 cents per barrel is $1,040,000.

An ESSF expenditure ceiling of $565,000 was approved for FY23 to provide funds to leverage federal grant funding and to pay special fund assessments. This enabled HSEO, as a grant subrecipient for an award from the Federal Emergency Management Agency, to provide the working capital for eligible project costs. The ESSF expenditure ceiling allowed HSEO to contract for the development of prioritized energy mitigation strategies for critical O’ahu facilities to help O’ahu communities become more energy resilient to hazards. Expenditures from the ESSF will be reimbursed with federal funds from HI-EMA. Without the upfront expenditure of ESSF monies, HSEO would not have been able to execute the federal grant and would have forfeited $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 FY23 was $429,280. SEP provides annual funding to enhance energy security, advance state-led energy initiatives, and maximize the benefits of decreasing energy waste. Federal expenditures in FY23, including prior year allocations, were $734,191. HSEO funds a temporary Fiscal Manager position and a temporary Decarbonization Program Manager position using SEP Formula funds.

State Energy Program – Bipartisan Infrastructure Law

HSEO is the expending agency for $3,512,680 in USDOE State Energy Program – Bipartisan Infrastructure Law (SEP – BIL) funds. HSEO will fund four temporary positions and three fellows from the University of Hawai‘i’s Data Science Institute. Funds will also be used to contract for professional regulatory analysis to support HSEO’s participation in various policy-related proceedings initiated by the Hawai‘i Public Utilities Commission; visualizations for depicting key aspects of decarbonization; and facilitation of outreach and engagement activities for the decarbonization study.

Grid Resilience and Innovation Partnership Formula Grant

In June 2023, the U.S. Department of Energy awarded $6,090,547 to the State of Hawai‘i via the Grid Resilience State and Tribal Formula Grants program, which is supported by the Bipartisan Infrastructure Law. Hawai‘i will hold a competitive selection process to select the highest impact projects, based on the information learned during the FEMA Hazard Mitigation Grant Program work described below.

Powering Past Coal Task Force – Subaward

Using $300,000 in Coronavirus State Fiscal Recovery Funds (CSFRF), HSEO contracted for qualified professionals to assist local government, and potentially other authorities having jurisdiction, with the timely permitting of both utility-scale renewable energy projects and customer-sited photovoltaic and battery systems, all of which will provide needed power and grid services over the transition period, anticipated to last into 2024, with project completion and closeout anticipated in calendar year 2025.

Hawai‘i Good Jobs Challenge – Subaward

HSEO received a subaward from the University of Hawai‘i for a project entitled “Hawai‘i Good Jobs Challenge: Resilient Hawai‘i.” HSEO will serve as a backbone and lead organization in the Clean Energy and Skilled Trades sector. HSEO's primary objective through this grant is to create workforce programs that will result in new jobs and job upgrades for Hawai’i residents in the clean energy and transportation sectors. HSEO will hire a full-time position to coordinate the employers in the Clean Energy and Skilled Trades sectors, identify employer workforce needs, seek providers of these needs in partnership with other grant partners, and support grant administrative and reporting requirements.

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.” In 2022 HSEO contracted for the conduct of a comprehensive inventory and risk, vulnerability, and dependency assessment of O‘ahu’s major energy supply distribution, and demand networks.

USDOE Community College Energy Code Training Program - Subaward

HSEO received a subaward from the University of Illinois – Smart Energy Design Assistance Center for a project entitled “Community College Energy Code Training Program.” The University of Illinois, in collaboration with State Energy Offices in Illinois, Nevada, and Hawai‘i carried out a training program for instructors at community colleges to provide hands-on workforce training, resources, videos and curricula to implement and prepare students for building energy efficiency and building energy code careers. Training was conducted for instructors and building professionals.

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 FY23, HSEO administered $840,055 of SEP-ARRA repurposed funds with expenditures of $350,709. HSEO funds a temporary Data Science Specialist position 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; building codes and inspection services; and sustainable transportation. In FY23, HSEO administered $2,430,633 of EECBG repurposed funds with expenditures of $270,581. HSEO funds a temporary Outreach and Community Engagement Specialist position and a temporary Energy Analytics Specialist position using EECBG funds.

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 $311,011 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 FY23 were $77,875. HSEO funds a temporary Clean Transportation Analyst position using VW funds.

U.S. Climate Alliance

The U.S. Climate Alliance, through the United Nations Foundation, awarded a grant to HSEO to provide capacity to work on Vehicle Miles Traveled (VMT) reduction strategies and state fleet conversion. In FY23, HSEO administered $290,000 of U.S. Climate Alliance funds with expenditures of $95,399.

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.

Other Program Administration

Solar Water Heater Variance Program*

Hawai'i Revised Statutes (HRS), Section 196-6.5, requires every single-family dwelling built after January 1, 2010 to 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. In the reporting period, HSEO updated the Life Cycle Cost Comparison form by accounting for the Inflation Reduction Act's increased renewable energy tax credit.

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 2024 Spending Plan, pursuant to HRS section 196-10.5; and Table 4: Administratively Established Accounts of Funds as of June 30, 2023, pursuant to HRS section 37-52.5.

Expenditures from the Energy Security Special Fund

ENERGY SECURITY SPECIAL FUND

	Actual FY2023	Projected FY2024
BEGINNING FUND BALANCE	**2,718,555**	**3,223,320**
REVENUES		
Environmental Response, Energy and Food Security Tax	1,190,886	1,040,000
Investment Pool Interest	56,440	10,000
Solar Water Heater Variance Fees	16,001	10,000
Other	46	-
TOTAL REVENUES	**1,263,373**	**1,060,000**
EXPENDITURES		
Hawaii State Energy Office Operations:		
Special Fund Assessments	61,164	65,000
Programs	347,444	682,369
TOTAL EXPENDITURES	**408,608**	**747,369**
TRANSFERS		
State Energy Office Decarbonization (Act 238, SLH 2022)	350,000	-
NET TRANSFERS	**350,000**	**-**
ENERGY SECURITY SPECIAL FUND BALANCE	**3,223,320**	**3,535,951**

Pursuant to Section 201-12.8, HRS

Hawaii Clean Energy Initiative Program
Fiscal Year 2024 Spending Plan

ANNUAL SPENDING PLAN

	State Funds	Other Funds	Total
Hawaii State Energy Office Operations	2,501,930	1,579,932	4,081,862
Programs and Projects	445,000	3,471,393	3,916,393
	2,946,930	5,051,325	7,998,255

Spending plan is based on anticipated spending levels for FY24

FUNDING SOURCES:

State Funds			
General Funds	2,501,930		2,501,930
Energy Security Special Fund	3,223,320		3,223,320
Federal Funds			
DOE - State Energy Program - Program Years 21/22/23		698,045	698,045
DOE - SEP BIL		850,000	850,000
DOE - Energy Efficiency & Conservation Block Grant *		410,000	410,000
DOE - SEP American Recovery & Reinvestment Act *		150,000	150,000
FEMA - Advance Assistance		300,000	300,000
DOE - Community College Energy Code Training		33,280	33,280
Coronavirus State Fiscal Recovery Funds		150,000	150,000
DOC - Hawai‘i Good Jobs Challenge		100,000	100,000
DOE - 40101D		135,000	135,000
Trust Funds			
VW Settlement Trust Funds		2,100,000	2,100,000
US Climate Alliance Grant		125,000	125,000
	5,725,250	5,051,325	10,776,575

* Repurposed ARRA Funds

Administratively Established Accounts or Funds
As of June 30, 2023

APPROPRIATION ACCOUNT/TITLE	MOF	REVENUE	EXPENDITURES	ENCUMBRANCES	ENDING BALANCE
S-17-216 STATE ENERGY PROGRAM-ARRA REPURPOSE	N	1,843,378	1,181,522	108,126	661,856
S-17-518 EECBG - ARRA REPURPOSE	P	2,829,545	605,894	89,222	2,201,051
S-18-255 STATE ENERGY PROGRAM	N	1,154,287	1,154,287	2,938	-
S-22-235 CC ENERGY CODE TRAINING PROGRAM	P	-	-	-	22,600
S-22-502 FEMA ADVANCE ASSISTANCE	P	-	-	-	-
S-23-226 SEP BIL - Hawai‘i	N	-	-	99,848	-
S-23-503 POWERING PAST COAL TASK FORCE	V	-	-	251,673	300,000
S-23-551 HAWAII GOOD JOBS CHALLENGE	P	-	-	-	-
T-20-910/T-21-910/T-22-910/T-23-910 VW DIESEL EMISSIONS ENVIRONMENTAL MITIGATION TRUST-NON-ADMIN EXP	T	7,036,576	195,574	-	6,841,002
T-23-922 US CLIMATE ALLIANCE GRANT PGM-VMT	T	310,520	141,899	1,588	168,621

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

Pursuant to Section 37-52.5, HRS

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions (July 1 2023 - June 30 2024)	2-year Actions	5-year Actions	Measure Performance
Decarbonization	Analyze pathways and develop recommendations for achieving the State's economy-wide decarbonization goals, including the statewide greenhouse gas emissions limit and goal to sequester more atmospheric carbon and greenhouse gases than emitted by no later than 2045 pursuant to section 225P-5, Hawaii Revised Statutes and in accordance with Act 236 (2022) and HRS 342B-71 (Statewide greenhouse gas emissions limit).	Procured consultants (E3 and NREL) to complete the technical analysis required to evaluate and quantify pathways needed to meet decarbonization goals pursuant to HRS 225P-5 and HRS 342B-71. Use models to develop policy recommendations. Conduct outreach on scenario development. Finalize and submit Act 238 report to the State Legislature.	Conduct stakeholder and community outreach engagement on completed report results and recommendations. Work with stakeholders to finalize the study and develop recommendations for policy actions and mechanisms to achieve decarbonization. Develop and recommend policy actions as recommended by the study to achieve short-term and long-term goals. Ensure decarbonization goals are included in the Priority Climate Action Plan (PCAP) for inclusion in the EPA Implementation Grants.	Complete a five-year follow-up report to check on progress to-date for all sectors economy-wide.	Implementation of the policies and mechanisms as recommended in the Decarbonization study completed in year 2. Measured reduction in greenhouse gas emissions as measured in the State greenhouse gas inventory completed by DOH. Continued progress toward renewable energy and clean transportation goals.
Stakeholder and Community Education, Outreach and Engagement	Maintain and enhance 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 initiatives and provides communities a collaborative voice in the energy transition.	Conduct public information and education on $6.5 million in slim-hole drilling research to be conducted on Maui and Oahu. Train Clean Energy Wayfinders in partnership with UH SeaGrant to further develop community engagement and technical skills, strengthen two-way channels of communication with communities, and build capacity of community-based organizations. Identify continued funding for the Clean Energy Wayfinders program.	Continue statewide facilitated, community-based workshops. Secure dedicated funding support for Clean Energy Wayfinders workforce development and community engagement program. Maintain integrated HSEO website and increase availability of relevant data, and community-based online engagement tools. Assess and improve strategic communications plan using email, digital and social media, and sponsorship/partnerships to inform and educate residents about clean energy, energy efficiency and affordability measures, clean transportation, energy assurances and resilience/reliability measures. Continue partnership with UH SeaGrant.	Develop and grow stakeholder working groups to include community leaders, industry, and non-profit organizations engaged in developing the Statewide Energy Strategy. Provide HSEO staff to community, industry, and intergovernmental events.	Increasing stakeholder engagement and public awareness as measured by relevant website and digital media performance metrics. Solicited feedback from stakeholders and community members on the value provided by the improved communications, outreach and engagement.
Stakeholder and Community Education, Outreach and Engagement	Implement Statewide Clean Energy Public Education and Outreach Program in coordination with Hawaii's Institutions of Public Education to expand and develop clean energy professional development and classroom curricula and toolkits and provide professional development credits for Hawaii DOE educators.	Continue Good Jobs Hawaii program. Support HIDOE teachers and students implementing the pilot CTE Energy Pathway during School Year 2023-2024. Connect Energy Pathway students to energy engagement opportunities including legislation, statewide energy planning processes, and local renewable energy development.	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. Continue supporting CTE Energy Pathway.	Reassess HIDOE Clean Energy Public Education Program to determine ongoing needs.	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.
Stakeholder and Community Education, Outreach and Engagement	Develop energy equity measures and framework to support state, county, and stakeholder activities. Provide support and tracking for federal-funded programs requiring adherence to Justice40 benefits. Work closely with stakeholders to develop and implement policies, programs, and measures that address full range of energy and climate equity/equality/justice and energy affordability issues.	Continue coordination of the Energy Equity Hui. Support Pacific RISA with the hiring of an Energy Equity Hui Lead Convener position funded by the EPA. Support the Climate Commission with the collection of Hawaii-centric data and mapping tools to identify disadvantanged communities for Justice40 requirements in federal funding applications.	Ongoing support of activities and outcomes of the Energy Equity Hui. Develop and implement consistent application of energy equity definition and measures to support partner programs. Implement and improve Hawaii-centric resources and mapping tools that improve Hawaii's access to federal program funds.	Assess state of energy equity policies and programs and determine ongoing needs.	Implementation of policies and programs identified by the Energy Equity Hui. Success of, and feedback received from, federal grant competitive grant applications related to specific energy equity and EJ 40 measures.
Renewable Energy Deployment	Support timely review and implementation of near-term renewable energy and battery storage projects (including the Stage 1, 2, and 3 RFP and CBRE) as well as distributed energy resources (rooftop solar) applications to provide needed energy and capacity as fossil facilities are retired. Lead efforts (such as the Powering Past Coal Task Force) to improve timely review, construction, and energization of approved projects.	Communicate with renewable energy project developers and permitting agencies regarding project timelines and barriers as they arise. Understand issues and identify solutions. Continue to support improvements in renewable energy project deployment. Maintain and update existing HSEO resources (Permit Wizard, EnerGIS, Energy Directory).	Communicate with government agencies and project developers to maintain awareness of issues, concerns, and processing timelines. Monitor progress of projects toward commercial operations and critical paths within the control of state and county government. Proactively address issues that arise. Identify dedicated funding to continue staff and government agency (including county) support. Update existing resources as needed (includes sourcing funds and procurement).	Continuously improve processes associated with approvals, siting, construction, and financing of cost-effective renewable energy projects. 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. Number of projects supported or facilitated. Number of concerns addressed. Successful retirement of fossil fuel plants across the state. Timely development of replacement renewable energy.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions (July 1 2023 - June 30 2024)	2-year Actions	5-year Actions	Measure Performance
Renewable Energy Deployment	Inform and advance the siting and permitting of renewable energy projects with longer lead times (e.g., geothermal, offshore wind, pumped hydropower, hydrogen, fuels) and later procurement cycles. Identify knowledge gaps, areas of concern, and regulatory barriers to implementation. Where necessary, advocate for policies and/or mechanism to overcome the gaps and address concerns and barriers. Serve as a partner agency for federal funding opportunities.	Provide input on key county and state policies (e.g., on-shore wind setbacks, real property taxation, etc.). Support research, studies, demonstrations, technical programs (e.g. by NREL/LBL/ANL/HNEI/UH/etc. on energy storage, batteries, fuels, recycling of energy products, bioenergy, geothermal, hydrogen, ocean, grid, etc.). Seek Federal and National Laboratory support. Apply for grants. Contract for services. Provide policy and assessment recommendations to other entities.	Continue to manage contracts and assessments identified in Year 1. Provide input on key policies (e.g., on-shore wind setbacks, real property taxation, solicited RFI's, utility procurement proposals, fuels, customer-sited systems). Apply for, implement, and distribute grant funding.	Continue to provide needed services, conduct assessments, and provide input on key policies. Sustain long-term renewable energy progress. Perform/support studies as needed (e.g., resource, technology, and financing assessments; hydrogen and energy storage; pumped hydro evaluation; co-product analyses; etc.).	Leverage of state and private funds to obtain federal funds. Number of projects supported or facilitated. Number of resource assessments conducted. Number of policies reviewed. Number and quality of solutions identified.
Renewable Energy Deployment	Identify potential opportunities for rooftop and other distributed solar deployment and market adoption, to include: financing programs, rebate and tax credit programs, including the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA). Act as a resource on distributed energy system inquiries.	Evaluate, apply for, and provide information to Hawaii entities on federal funding through the IIJA and IRA. Identify barriers to Hawaii's rooftop solar penetration. Work in collaboration with the Hawaii Green Infrastructure Authority, Hawaii Solar Association and Hawaii Energy to leverage programs and partnerships for onsite energy systems. Provide information to Hawaii taxpayers on federal and state energy tax credits.	Continue ongoing assessment, evaluation and partnership deployment of program opportunities and incentives through county, state, and federal onsite energy system programs and initiatives.	Continued successful installation of customer-sited energy systems, including solar, energy storage, demand response, and other grid interactive technologies supportive of on-site energy production and statewide energy reliability and resilience.	Programs and projects supported; federal/state dollars leveraged to support solar programs; number of taxpayers assisted (solar tax credit call center)
Renewable Energy Deployment	Administer Solar Water Heater Variance (SWHV) program	Review, refine, and update applications and forms. Receive, review, and process applications. Suggest improvements and implement where feasible.	Review, refine and update forms. Receive, review, and process applications.	Review, refine and update forms. Receive, review, and process applications.	Meet HSEO obligations
Renewable Energy Deployment	Perform functions required under the Renewable Fuels Production Tax Credit (RFPTC).	Develop and post on website: Notice of Intent and Third-Party Validation; Lifecycle Analysis (LCA) requirements; guidelines. Establish baseline fuel values. Receive applications. Evaluate, conduct LCA review. Issue certificates.	Review, refine, and update applications and forms. Receive and review applications; conduct LCA review, update fuel comparisons, make determinations of qualification based on data provided by taxpayer applications on annual basis. Report to legislature annually.	Review, refine and update online applications and forms. Receive, review applications and conduct LCA review, update fuel comparisons, make determinations of qualification based on data provided by taxpayer applications on annual basis. Report to legislature annually.	Meet HSEO obligations, annually, as outlined under HRS §235-110.32.
Energy Efficiency	Improve the efficiency and cost-effectiveness of Hawaii's energy-using buildings, equipment, and systems in order to reduce the total cost to residents, reduce energy losses, and achieve energy balance sooner.	Apply for and coordinate State activities under federal energy programs (including the 2022 Inflation Reduction Act, Section 50121 Home Efficiency Rebates and Section 50122 Home Electrification & Appliance Rebates, and Energy Efficiency Revolving Loan Fund). Participate in the Energy Efficiency Portfolio Standard (EEPS) Technical Advisory Group and Technical Working Group, providing review, assessment, and recommendations for the Public Benefit Fee Administrator, Triennial Plan, and EEPS Enhancement. Plan for implementation of Appliance Efficiency Standards.	Continue to administer and report on the Federal energy efficiency rebate programs. Evaluate, implement, and support cost-effective energy efficiency and demand response policies, projects, and initiatives statewide, including activities of the Energy Efficiency Portfolio Standard advisory and working groups.	Continue to administer and report on the Federal energy efficiency rebate programs. Continue evaluation, implementation, and support of cost-effective energy efficiency and demand response policies, projects, and initiatives statewide. Where appropriate, coordinate and apply for funding to support energy efficiency and energy demand management projects and initiatives.	Continued progress towards statewide energy objectives. Improved energy efficiency (i.e. reduced waste) will moderate the amount of energy that will need to be imported and locally produced in order to achieve energy independence and carbon reduction objectives. With less waste, Hawaii will achieve energy balance sooner.
Energy Efficiency	Provide leadership and support to improving the energy profiles of state facilities, including consideration of vehicle energy use and electrification. Act 239, Session Laws of Hawaii 2022: (a) requires state facilities, with the exception of smaller facilities, to implement cost-effective energy efficiency measures; (b) directs HSEO to collect all state-owned facilities' utility bill and energy usage data and make this data publicly available; and (c) beginning July 1, 2023, requires, where feasible and cost-effective, the design of all new state building construction to maximize energy and water efficiency and energy generation potential and to use building materials that reduce the carbon footprint of the project.	Obtain Federal approval and contract for 2 new projects: State Facilities Benchmarking; State Facilities Energy Strategy; coordinate with other State agencies, over 1300 facilities; target project completion date: mid 2025.	Identify "Tier 2" State facilities with energy efficiency retrofit potential and likely candidates for Energy Savings Performance Contracts or other financing options. For both Tier 1 and Tier 2 facilities, identify demand response or other potential tariff /aggregator participation options to reduce State agency energy (electricity and fuel) costs. Seek Federal funding and other support for the stated objective of maximizing energy and water efficiency and energy generation potential and to use building materials that reduce the carbon footprint of the project.	Provide assistance to support government agencies in financing energy efficiency and cost reductions via operational changes, energy savings performance contracts, or other financing mechanisms. Hawaii Revised Statutes, Section 196-30, also requires that every five years, major facilities be “retro-commissioned.”	Meet HSEO obligations as outlined in HRS; collect and post data on energy use of state facilities; measure, report, and achieve improved energy profiles of state facilities, including consideration of vehicle energy use and electrification.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions (July 1 2023 - June 30 2024)	2-year Actions	5-year Actions	Measure Performance
Energy Efficiency	Energy Code Updates, Working Group, and Training. Pursuant to HRS Section 107-22(4), HSEO is a voting member of the State Building Code Council (SBCC) and the Council's Investigative Committee for the International Energy Conservation Code (IECC). Provide leadership in Energy Code and Community College Train the Trainer events and toolkits.	Prepare to apply for Federal funding for building codes (IRA §50131); with Counties, draft application and plan (due in 2025). Support activities of the State Building Code Council, consistent with laws, directives, and proclamations. Support and provide training on energy codes. Seek funding for analyses relating to energy codes, costs, and related issues.	Provide training on current energy codes, International Energy Conservation Code (IECC), and amendments. Assist with funding, demonstrations, training, and applications of energy auditing, efficiency, standards, cool roofs / cool walls, water heating, ventilation, and cost management for low and moderate income residences.	Adopt the amended 2024 IECC as a state code. Assist counties with adoption of the amended 2024 IECC at the county level. Provide training on the 2024 IECC. Continue assistance to community groups working in low-income areas re: energy audits, installation of high-efficiency lights and water fixtures, high-efficiency water heaters, cool roofs and walls, ceiling fans, and efficient appliances. 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.	Timely updates (Hawaii amendments) to the International Energy Conservation Code, which is amended every 3 years. Adoption at the State level. Adoption at the County level. Meetings of the SBCC. Training and the number of trainees that attend informational events on the updated versions of the IECC.
Energy Efficiency	Hawaii Green Business Program - Pursuant to HRS 196-71(b)4, HSEO is directed to engage private sector to lead clean energy efforts.	Recruit participant organizations and provide technical assistance and training. Conduct forums and recognition ceremony to promote businesses and organizations that are leaders in energy efficiency, renewable energy and clean transportation. Expand outreach and participation in the Hawaii Green Business Program to small and rural businesses in the state.	Continue to collaborate with other organizations, the Clean Energy Wayfinders and VISTAs to reach more small and rural businesses and organizations on Oahu and the Neighbor Islands to increase participation in the Hawaii Green Business Program.	Pursue federal and other funds to support the expansion and growth of the Hawai'i Green Business Program.	Number of businesses that are recruited, participate and are recognized in the Hawaii Green Business Program (HGBP). Energy, water and waste reduction metrics from each year's awardees.
Federal Grant Opportunities	Apply for and administer Federal funding directed to Hawai'i for energy, including from the CARES Act, IIJA, IRA, EECBG, and other relevant programs.	Track funding opportunities. Identify potential sources of matching funds where necessary or advantageous to Hawaii. Coordinate with participant organizations in applications for Federal funding of energy efficiency and renewable energy. Submit and accept applications, concept papers, and responses to Requests for Information in compliance with State procurement requirements.	If projects advantageous to Hawai'i are identified and funding and partners are available, coordinate and support applications, consistent with Hawai'i's procurement requirements. If grants or cooperative agreements are provided, carry out the projects.	If projects advantageous to Hawai'i are identified and funding and partners are available, coordinate and support applications, consistent with Hawai'i's procurement requirements. If grants or cooperative agreements are provided, carry out the projects.	Identification and pursuit of opportunities; successful application for and management of funds; achieving the objectives set forth in the grants and agreements.
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.		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.	
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 and the development of a multi-year training and exercise plan; fill a second position to support energy assurance operations and training; participate in Makani Pahili and the Clear Path XI exercises; coordinate with federal ESF-12 trainers for additional just-in-time training; incorporate where possible staff from the PUC (ESF-12 support agency).	Implementation of multi-year training exercise workshops for SESF 12/SERT; 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.
Energy Assurance and Resiliency	Develop an Energy Common Operating Picture (COP) for both energy assurance and resiliency planning and emergency response.	Complete Advance Assistance grant assessing Oahu's energy supply chain identifying projects and strategies for integration into State and County Hazard Mitigation Plans; begin a refresh of the EIIRP program forms and reporting as well as analysis and visualization of data; update Energy Security Plan	Utilize BRIC Set-Aside funding to carry out an energy supply chain assessment (Advance Assistance 2.0) for neighbor islands and complete a statewide COP; update energy assurance operations and training;	Continue to update and maintain statewide energy COP; update State Energy Security Plan regularly;Energy assurance capability that incorporates all energy resources on a given island to enhance island energy security and overall resiliency.	Number of up-to-date Energy Security Plans or other operational documents; Energy stakeholders coordinated with, energy supply chains monitored, percentage of events staffed in the role of SESF 12.

Table 5 - HSEO Goals, Plans and Measurements

HSEO Topic	Priority Objectives and Policies	1-year Actions (July 1 2023 - June 30 2024)	2-year Actions	5-year Actions	Measure Performance
Energy Assurance and Resiliency	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.	Implement BRIC award; implement two GRIP awards; design and implement 40101(d) grid resilience program; submit applications for next BRIC, GRIP, HMGP, 40101(d) funding cycles	Develop applications for projects identified in the Oahu Advance Assistance project for future funding applications. Continue implementation of existing BRIC, GRIP, and 40101(d) funded projects.	Develop a self sustaining pipeline 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 identified. Energy projects integrated into state and county hazard mitigation plans. Federal and private dollars leveraged.
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.	Serve as co-chair on the Clean Ground Transportation Working Group and Interisland Clean Transportation Working Group. In collaboration with HDOT and OPSD develop plans to ensure that the State's electric charging capacity is sufficient to support the growing use of electric modes of transportation. Release the third year of the Diesel Replacement Rebate (DRR) for zero emission medium and heavy duty vehicle rebates funded through the Volkswagen Settlement fund. Submit applications under the competitive DERA program to provide additional funding to the DRR program. Submit applications for federal funding under CFI utilizing Volkswagen funds as cost match for EV charging infrastructure. Continue the Zero Emission Bus Project with the counties.	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. In collaboration with governement agencies submit applications for federal funding for electric vehicle charging infrastructure.	Deploy all Volkswagen Settlement funds except for the final year of DRR 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. Identify and access funding sources to support continuation of the DRR program for MDHD vehicle rebates.	Percentage of Volkswagen Settlement Funds deployed. The percentage by which Volkswagen funding is leveraged with federal and private sector dollars.
Clean Transportation	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.	Implement a formal fleet exemption process in support of DAGS to evaluate and track exemption requests. Act as a resource to other state and county agencies looking to access the HDOT RFP to electrify their fleets. Collaborate with state agencies and stakeholders to apply for and deploy federal funds to convert public fleets and identify resilient charging solutions.	Continue to support DAGS in the evaluation of exemption requests. Continue analysis of resilient charging solutions for government and public vehicles.	Assess progress towards the State's goals to achieve 100% ZEV light duty passenger car fleet by 2030 and 100% light duty fleet including trucks and MPVs by 2035. Identifying programs and projects to mitigate barriers and accelerate adoption as necessary to achieve state goals.	Percentage of state fleet converted to ZEVs.
Operations	Identify and track potential competitive grant opportunities through IRA and IIJA. Maintain compliance with all SEP formula funds.	Maintain updates to HSEO tracking program for IIJA and IRA competitive grant opportunities. Coordinate with stakeholders and industry participants to submit strong competitive grant applications for federal funds to support energy assurance and reliability and the clean energy transformation. Maintain compliance with all grant awards.	Continue to maintain updates to tracking program for IIJA, IRA and other competitive grant opportunities. Continue to coordinate with stakeholders and industry participants to submit strong competitive grant applications for federal funds to support energy assurance and reliability and the clean energy transformation. Continue to maintain compliance with all grant awards.	Assess programs and determine ongoing needs.	Successful grant applications. Feedback received from grant reviews. Implementation of successfully funded programs and corresponding metrics.
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 and create workforce development opportunities through a data fellows program. Develop the energy data governance framework for Hawai'i through a federally funded Data Scientist and graduate student Fellows in partnership with UH Data Science Institute.	Support the new data scientist position with the second cohort of graduate data scientist studentfellows. Identify priority data governance and data science activities including the continued build out of HSEO's Data Portal. Onboard 3 new University of Hawaii Data Science Institute graduate student fellows.	Implement identified data governance priority activities. Train graduate students. Expand data sharing and portability. Make improvements to the Data Portal. Identify and pursue potential long-term funding for the position and activities.	With a data governance framework largely in place, 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 governance and data science activities.	Common data standards and practices across Hawai'i's energy ecosystem. Accessibility of data sets. Number of data sets made available on data sharing platform. Number of downloads of shared data sets. Number of users accessing data sharing platform