

HAWAI‘I

- *RPS: 30% by 2020; 100% by 2045*
- *0.33% of US carbon emissions*
- *0.5% of US GDP*

Hawai‘i’s energy paradigm of 100% renewable energy is based on the following five principles: (1) diversifying Hawai‘i’s energy portfolio; (2) connecting and modernizing its grids; (3) balancing technical, economic, environmental, and cultural considerations; (4) leveraging Hawai‘i’s position as an innovation test bed; and (5) creating an efficient marketplace that benefits producers and consumers. In adapting to climate change, Hawai‘i seeks to integrate climate change considerations into existing systems as well as develop new solutions. Hawai‘i continues to push forward on mitigation and adaptation solutions, including during the 2017 legislative session, where it passed laws creating a green fund for

the University of Hawai‘i to finance and track energy efficiency improvements, adopting the latest building codes, and signing into law its commitment to the Paris Agreement through its newly established Climate Commission.

FINANCE

- *Environmental Response, Energy, and Food Security Tax* – Also known as Hawai‘i’s “Barrel Tax,” this is a \$1.05 tax per barrel of petroleum products imported into Hawai‘i (excluding aviation fuel and fuel sold to a refiner). The Barrel Tax discourages fossil fuel consumption and funds environmental response, energy security and systems, and food security initiatives, including the Hawai‘i Clean Energy Initiative and Hawai‘i Natural Energy Institute, among other programs.
- *Green Energy Market Securitization (GEMS) Program* – GEMS is an innovative, sustainable green financing initiative designed by the Hawai‘i State Energy Office to make clean energy improvements more affordable and accessible for Hawai‘i consumers. The program provides low-cost capital to finance solar photovoltaic systems and other clean energy improvements for those who may otherwise have difficulty obtaining financing for these projects. Low-credit homeowners and renters — as well as nonprofits and small businesses — are among those who can qualify for project financing through GEMS. GEMS has the ability to finance the installation of over 44 MW of energy, assisting as many as 30,000 Hawai‘i consumers, greatly reducing their energy expenses and advancing Hawai‘i’s aggressive clean energy mandates. GEMS utilizes two unique financing structures to provide low-cost financing that enables consumers to invest in clean energy installations. The first is a rate reduction bond structure to capitalize the program and finance residential and commercial clean energy infrastructure. On-bill repayment will be the second financing structure used by GEMS. Borrowers pay for energy-saving devices made over time through their electricity bill and their energy savings. This financing tool, developed in partnership with the Public Utilities Commission and the investor owned utility, enables the program to lend to riskier borrowers while also mitigating associated risk. Together, these financing structures allow GEMS to be more inclusive and self-sustaining.

- *100% Renewable Portfolio Standard* – Hawai‘i has committed to achieve the RPS goal by 2045 based on the following schedule of intermediate targets: 30% of its net electricity sales by the end of 2020; 40% by 2030; 70% by 2040; and 100% by 2045. “Renewable portfolio standard” means the percentage of electrical energy sales that is represented by renewable electrical energy generated by the utilities, independent power producers, and customer-sited, grid-connected sources. The sources are wind, sun, falling water, biogas, geothermal, ocean water currents and energy conversion, biomass, biofuels, and hydrogen from renewable sources (and excludes energy efficiency and solar water heating). Each electric utility is also required to file an annual RPS status report.
- *Hawai‘i Clean Energy Initiative* – HCEI is a framework of statutes and regulations supported by a diverse group of stakeholders, composed of government, utilities, researchers, community groups, and businesses, committed to Hawai‘i’s clean energy future. The initiative was launched in 2008 when the State of Hawai‘i and U.S. Department of Energy signed a groundbreaking Memorandum of Understanding (MOU) to collaborate on the reduction of Hawai‘i’s heavy dependence on imported fossil fuels. In 2008, the state estimated that 60-70 percent of future energy needs could be fulfilled by local, clean, renewable energy sources. HCEI identifies and proposes policy solutions for key transformation points for the financial, regulatory, legal, and institutional systems that govern energy planning and delivery within the state.
- *Hawai‘i State Energy Office (HSEO)* – The Hawai‘i State Energy Office’s (HSEO) mission is to maximize Hawai‘i’s energy self-sufficiency and security by developing and utilizing local energy resources in a balanced way. HSEO guides the state toward its goals to achieve 100 percent renewable energy in the electricity sector by 2045, reduce electricity consumption by 4,300 gigawatt-hours by 2030, and reduce petroleum use in transportation. HSEO works toward the deployment of clean energy infrastructure and serves as a catalyst for energy innovation and test bed investments. HSEO is “one-stop” for regulation and incentives, such as EV free parking. It assists renewable energy producers with navigating Hawai‘i’s permitting and regulatory structure and serves as a central focus for the many renewable energy efforts underway throughout Hawai‘i.
- *Hawaii Natural Energy Institute (HNEI)* – HNEI is a research unit of the University of Hawai‘i that conducts research of state and national importance to develop, test and evaluate novel renewable energy technologies. Its mandate is to explicitly include coordination with state and federal agencies; and the demonstration and deployment of efficient end use technologies including those that address peak electric demand issues. The Institute leverages its in-house work with public-private partnerships to demonstrate real-world operations and enable integration of emerging technologies into the energy mix. Programs focus on identifying technically sound, cost effective solutions and practical strategies that can be implemented to deliver commercially viable renewable energy. The goal is to achieve a stable and cost-effective energy mix for Hawai‘i, while reducing our dependence on oil and other fossil fuel resources. HNEI serves as the implementing organization for several large, public-private partnerships to develop, deploy and demonstrate renewable energy systems. HNEI continues to forge strong partnerships with industry, state, and national organizations creating a thriving synergy that expands resources and accomplishments for all involved.
- *Greenhouse Gas (GHG) Inventory* – In 2007, Hawai‘i passed Act 234 to establish the state’s policy framework and requirements to address GHG emissions. The law aims to implement cost-effective emission reductions and enhance GHG sinks to achieve emission levels at or below Hawai‘i’s 1990 GHG emissions (approximately 13.66 million metric tons per year) by January 1, 2020. In 2008, the state of Hawaii developed statewide GHG emission inventories for 1990 and 2007 and is currently undergoing an update to the 1990 and 2007 estimates, as well as developing estimates for 2010 and 2015. The inventory includes the following sectors: residential, commercial, industrial, visitor, marine, freight, power, waste, and agriculture and forestry. It excludes aviation and bunker fuel sources.
- *Greenhouse Gas (GHG) Rules* – In June 2014, the Department of Health (DOH) amended the Hawai‘i Administrative Rules to specify a 16% GHG emission cap for large existing stationary sources (“affected sources”) with potential carbon dioxide equivalent (CO₂e) emissions at or above 100,000 tons per year. Each affected source must submit a GHG emission reduction plan for establishing measures that will be used to meet the emission cap. The approved GHG emission cap and associated monitoring, recordkeeping, and reporting provisions are made part of the facility’s covered source permit. Beginning in 2015, GHG emissions must be included in the calculations to determine annual fees for all facilities holding a covered source permit.

- *Natural Energy Laboratory of Hawai'i Authority (NELHA)* – NELHA's mission is to develop and diversify the Hawai'i economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner. The State of Hawai'i has invested over \$100 million since 1974 to create HOST Park, a unique outdoor demonstration site for emerging renewable and ocean based technologies, including a 100 kW ocean thermal energy conversion (OTEC) turbine connected to the HOST Park research campus micro grid. NELHA plans to also host a 1 MW OTEC facility at HOST Park in the future. Three sets of pipelines deliver deep sea water from up to 3,000-foot depth as well as pristine sea surface water. Solar insolation is among the highest for coastal areas in the United States. NELHA is unique for energy and distributed energy applied research, demonstration, test and evaluation, and deployment of clean energy technologies, especially in hosting collaborative research by academics and businesses from around the Pacific.

- *Energy Efficiency and Environmental Standards for State Facilities, Motor Vehicles, and Transportation Fuel* – Agencies are directed to design and construct buildings meeting LEED silver or comparable system, incorporate energy-efficiency measures to prevent heat gain in residential facilities, install solar water heating systems where it is cost-effective, implement water and energy efficiency practices, incorporate principles of waste minimization and pollution prevention, and use life-cycle cost-benefit analysis to purchase energy efficient equipment. For example, the Department of Transportation is converting to high-efficiency lighting at Hawai‘i airports, harbors, and along highways, and installing solar photovoltaic systems at transportation facilities. The total guaranteed energy savings at Hawai‘i’s airports is more than \$600 million over a 15-year period with the addition of Phase 2.
- *State Alternate Fuel Standards* – The State shall facilitate the development of alternate fuels and support the attainment of a statewide alternate fuels standard of 10% of highway fuel demand to be provided by alternate fuels by 2010, 15% by 2015, 20% by 2020, and 30% by 2030. For motor vehicles and transportation fuel, state agencies are to purchase fuel-efficient vehicles and include projected fuel costs in life-cycle cost-benefit analysis.

- *Hawai‘i Energy Efficiency Portfolio Standard (EEPS)* – Hawai‘i’s EEPS is a statutory requirement to achieve an aggressive, long-term energy efficiency goal over time. Hawai‘i’s EEPS law is similar in concept to Hawai‘i’s RPS. The EEPS targets are focused on reductions in the demand or consumption of electricity. The EEPS is designed to achieve 4,300 gigawatt hours of electricity use reductions statewide by 2030. The Public Utilities Commission can adjust the 2030 standard by rule or order to maximize cost-effective energy-efficiency programs and technologies. A key means to achieve the RPS is through the Hawai‘i Energy program. Hawai‘i Energy’s mission is to empower island families and businesses to make smarter energy choices to reduce energy consumption, save money, and pursue a 100% clean energy future. It is funded by a surcharge on utility bills that is based on a percentage of total utility revenue. The surcharge appears on customers’ bills and distinguishes between residential and commercial/industrial customers. Customers are eligible to receive incentive, rebates, and exchange programs, such as for solar water heating installations and energy efficient appliances.
- *Ka Hei Department of Education Energy Efficiency and Sustainability Program* – Ka Hei integrates energy efficiency and sustainability improvements into facility upgrades and student education through a combination of energy efficiency measures, clean energy generation (including photovoltaic projects, small-scale wind turbines, microgrids, and storage), and a comprehensive sustainability program. Students and teachers will experience science lessons through on-campus Living Laboratories and curricula that are hands-on, island-based, and relevant for college and career preparedness. From opportunities to shadow engineers and subject matter experts in the field, to analyzing energy data from a live feed on site, students and teachers will have greater access to the tools and ideas needed to build a more diverse, sustainable energy future for Hawai‘i. Teachers receive ongoing professional development sessions from several community partners. These workshops integrate the energy technologies being installed to modernize campuses and complement classroom learning.

- *Sustainable Hawai‘i Initiative* – Governor Ige launched the Initiative at the World Conservation Congress, held in Honolulu in 2016. The Initiative is built on Hawai‘i’s Aloha+ Challenge, itself organized similarly to the Sustainable Development Goals. The Initiative brings together specific aspects of sustainability that move Hawai‘i to lower emissions and better climate adaptation: double local food production by 2020; implement Hawai‘i’s interagency biosecurity plan by 2026; protect 30% of Hawai‘i’s priority watersheds; effectively manage 30% of Hawai‘i’s marine areas; and achieve 100% renewable energy by 2045. Bringing these goals together enhances collaboration and integration across departments and sectors.
- *Native Forest Restoration and Carbon Sequestration* – Hawai‘i is exploring options for new revenue streams from the various ecosystem services provided by the lands under its jurisdiction to supplement funding of natural resource management activities. Carbon sequestration is an ecosystem service for which a market, for both compliance and voluntary carbon offsets, already exists. The State is starting a public-private pilot to reforest about 5,500 acres on Mauna Kea with native trees that support development of appropriate habitat for the palila bird in conjunction with adherence to a greenhouse gas emission reduction standard to produce carbon offset credits. Hawai‘i is also initiating a state project to a forest restoration and carbon sequestration project on Haleakalā that is in development.

- *State Planning Act, Climate Change Adaptation Priority Guidelines* – Act 286 (2012) was passed to adopt a statewide climate adaptation policy for addressing the impacts of climate change. The Act added this policy to the State Planning Act, thereby requiring all county and state actions to consider the policy in land use, capital improvement, and program decisions. The State Office of Planning works with stakeholders primarily through the Ocean Resources Management Plan (ORMP) program to implement the policy. The ORMP includes county, state, and federal stakeholders who implement public projects and programs and coordinate on adaptation research projects, one of which is a set of case studies of what managed retreat could look like under different scenarios. The ORMP is a coordinated effort that includes input from the community, businesses, and non-profits who contribute to and support these efforts.
- *Island Climate Adaptation Committee (ICAC)* – In 2014, Hawai‘i State Legislature passed the Hawai‘i Climate Adaptation Initiative Act (Act 83, Session Laws of Hawai‘i). It acknowledged that climate change is the paramount challenge of this century, posing both an urgent and long-term threat to the State’s economy, sustainability, security, and way of life. The Act’s purpose is to address the effects of climate change to protect the State’s economy, health, environment, and way of life. Act 83 established the ICAC, co-chaired by the State Department of Land and Natural Resources (DLNR) and the State Office of Planning. The ICAC is developing a statewide Sea Level Rise Vulnerability Assessment and Adaptation Report (SLR Report) by December 31, 2017. The Paris Agreement bill signed in 2017 converted the ICAC into the Climate Commission.
 - *Climate Change Mitigation and Adaptation Commission (“Climate Commission”)* – To meet Hawai‘i’s commitment to the Paris Agreement, the state passed Act 32 (2017), to enshrine the principles and goals of the Paris Agreement as the framework for Hawai‘i to pursue climate change planning. The ICAC was repurposed to the Climate Commission and the scope of responsibility was expanded to develop a statewide climate change mitigation and adaptation strategy. The Climate Commission will complete the ICAC sea-level rise study and meet in 2017 to begin strategizing how best to pursue its mission.