

State of Hawaii  
Energy Resources Coordinator's  

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Annual Report 2014

# THE POWER TO TRANSFORM HAWAII'S CLEAN ENERGY FUTURE IS IN YOUR HANDS.

## SOLAR. WIND. BIOFUELS. HYDRO.

Hawaii is implementing clean energy technology and using our abundant natural resources like never before. The state is nearly halfway toward its goal of 70 percent clean energy by 2030. But to keep Hawaii from being the most oil-dependent state in the nation and to exceed our own ambitious goals, we have to do more.

This report shows our state's clean energy progress in the last 12 months and how the Hawaii State Energy Office (HSEO) is creating policies and programs that are actively positioning the state as a clean energy innovator. To keep moving forward, Hawaii must continue to modernize the grid, explore alternative fuels and seed an innovation ecosystem. We each play a role through continued conservation, efficiency, supportive policy making, and education. Let's continue to change the way we think of energy production and consumption in Hawaii.

**Clean energy starts with you.**

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# INTRODUCTION

This edition of the Energy Resources Coordinator's report comes at a time when Hawaii's strategy for economic growth and diversity is focused on energy transformation. By deploying clean energy infrastructure and attracting test bed investments and innovation, Hawaii is creating a clean energy cluster that is becoming a new driver for our economy.

The report highlights the state's clean energy success in 2014, including surpassing our interim goal for renewable energy generation two years early. As a result of this progress, we are now committed to going beyond the original target of 40 percent renewable energy by 2030 as outlined in the Hawaii Clean Energy Initiative. 2014 also marked the launch of the DBEDT-initiated Green Energy Market Securitization program and the establishment of the Green Infrastructure Authority pursuant to Act 211 (2013). The creation of innovative programs like this will help raise the capital needed for Hawaii to pursue its clean energy goals.

Through our responses to landmark Public Utilities Commission dockets on distributed generation interconnection and utility planning, DBEDT offered its vision for a new utility business model that supports a network of smart, interconnected grids. This will bring higher rates of renewable energy penetration and potential savings to electric utility customers.

Hawaii's leadership in late-stage development and deployment of these technological innovations is a key part of our emerging status as one of the world's top clean energy test beds.

It is imperative that Hawaii remain committed to the energy transformation now underway. Doing so will help bring our energy prices under control, provide greater energy security for Hawaii, protect our environment, and strengthen and diversify our local economy.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard C. Lim", with a stylized flourish at the end.

**Richard C. Lim**  
*Director, Department of Business, Economic Development and Tourism*

# EXECUTIVE SUMMARY

## The Role of the Energy Resources Coordinator and DBEDT's Hawaii State Energy Office

As the Energy Resources Coordinator (ERC), the director of the Department of Business, Economic Development and Tourism (DBEDT), is responsible for planning, managing, and monitoring Hawaii's energy program as mandated by the Hawaii Revised Statutes (HRS 196-4).

Under the leadership of the ERC, the Hawaii State Energy Office (HSEO) works to implement the state's clean energy vision to transform Hawaii's economy by growing the clean energy sector. To this end, HSEO deploys clean energy infrastructure as a catalyst for economic growth, energy innovation and test bed investments. HSEO aims to align its policies among government agencies and the private sector. It provides the framework and tools for energy developers and investors to pursue opportunities that further Hawaii's clean energy economy.

From 2008 through 2013, the vision of HSEO focused on the Hawaii Clean Energy Initiative (HCEI) goals to:

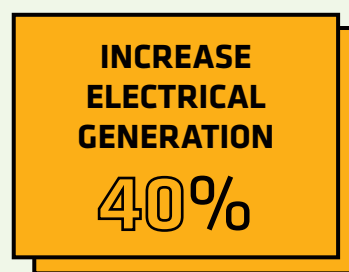
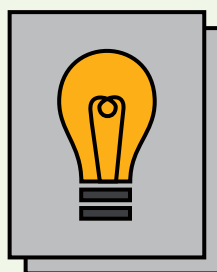
- Reduce electrical energy consumption by 30% (Hawaii Revised Statutes, Section 269-96);
- Increase electrical generation from renewable resources to 40% (Hawaii Revised Statutes, Section 269-91 through 95); and
- Reduce the use of petroleum for ground transportation by 70%.

In 2014, with great strides made in achieving of these goals, Hawaii now finds itself in a new energy ecosystem, that requires an update to existing methods. **HCEI 2.0 is helping drive the formation of this new ecosystem by implementing grid modernization and interconnection, as well as bridging the gap between conventional and renewable energy sources with transitional fuels.**

There are also growing demands for energy efficiency and high impact, innovative programs that advance the progress towards our goals. With an updated approach to community and industry collaboration, HCEI 2.0 provides strategic guidance to new energy programs and policies.

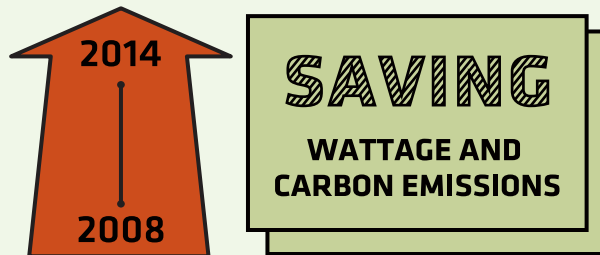
## Renewable Energy

Progress in renewable energy is measured against Renewable Portfolio Standards (RPS). Hawaii has steadily increased in quantity and energy generation since 2008. For instance, Hawaiian Electric Companies and Kauai Island Utility Cooperative reported that as of December 31, 2013, on a cumulative statewide basis, they have achieved a RPS of 17.97%, which means Hawaii has effectively surpassed the 2015 interim goal two years early. Programmatic updates have also increased the prevalence and utilization of renewable energy projects statewide.



## Energy Efficiency

Energy Efficiency Portfolio Standards (EEPS) track the efficiency of conventional and new energy sources. In 2013, Hawaii's EEPS level was 15.7%. Measures for performance contracting have also trended well in the last year, saving both electricity and carbon emissions. Additionally, the greater business community has responded positively to green-themed programming around energy efficiency, extending the impact of a new and improved energy ecosystem.



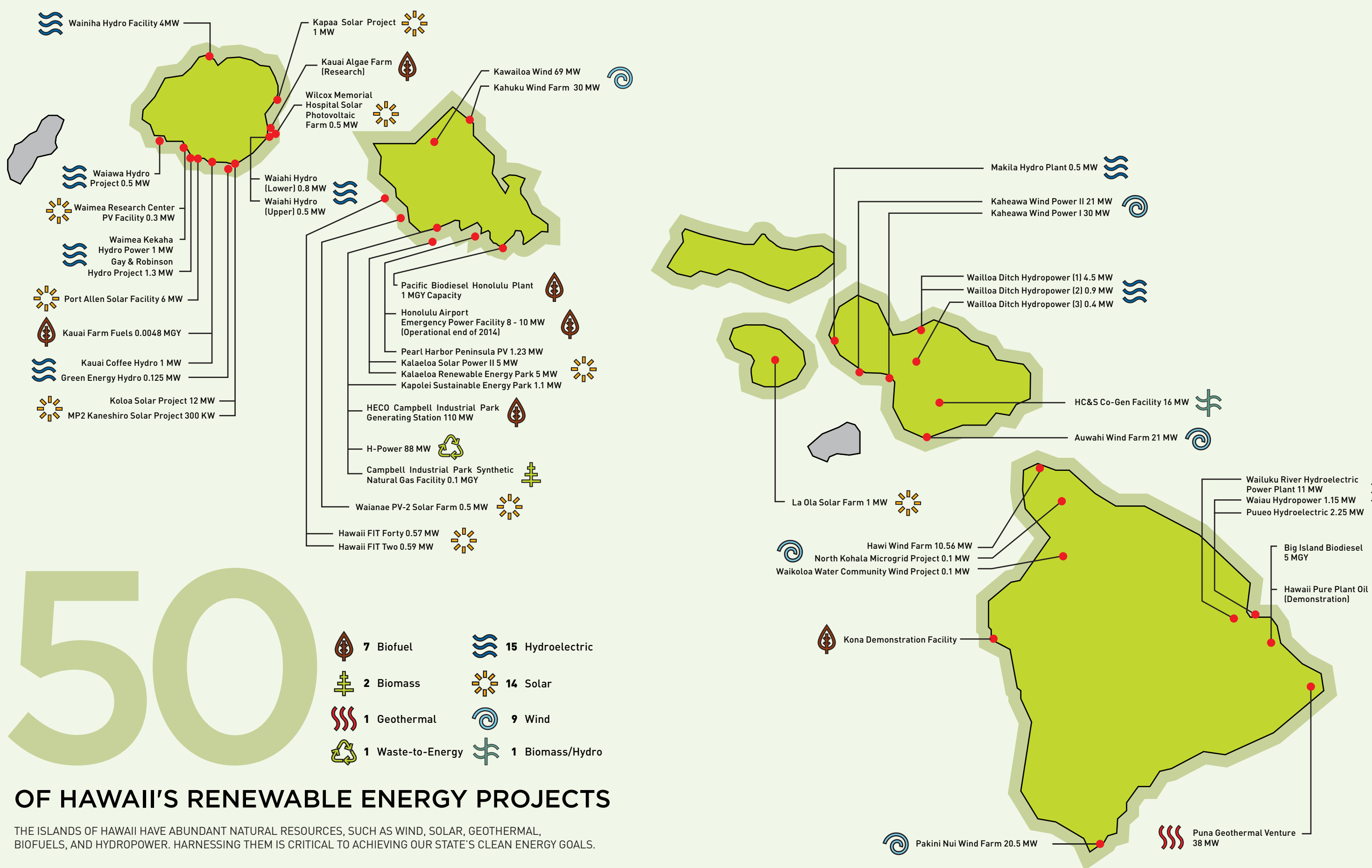
## Entrepreneurship and Innovation

As one of the world's leading test beds for energy innovation, Hawaii has embraced energy entrepreneurship. By developing technologies that can be utilized in communities statewide, new business ventures are helping to advance the state's energy agenda and improve our overall economy. The Green Energy Market Securitization (GEMS) program features an impressive renewable funding model that will create a stable investment platform for residents and businesses. With the activation of this program, underserved consumers will greatly reduce their energy expenses and our clean energy industry will benefit from new business in untapped market segments. This is just one example of several dynamic ideas that are improving renewable and Energy Efficiency Portfolio Standards statewide.

## Energy Program Funding

Support for HSEO and its affiliated programs is primarily derived from the Energy Security Special

Fund (ESSF). This fund receives a portion of fees from the sale of petroleum products. Appropriately, a small fee on the sale of carbon-intensive petroleum products supports the Hawaii Clean Energy Initiative, which effectively serves to mitigate the harmful effects of imported oil. Additional funding is also provided by the U.S. Department of Energy as well as other federal offices. HSEO is a conscious steward of an extensive portfolio that invests in reducing future energy costs for future generations. The details of these line items, expenditures and revenues are further explained later in this report.







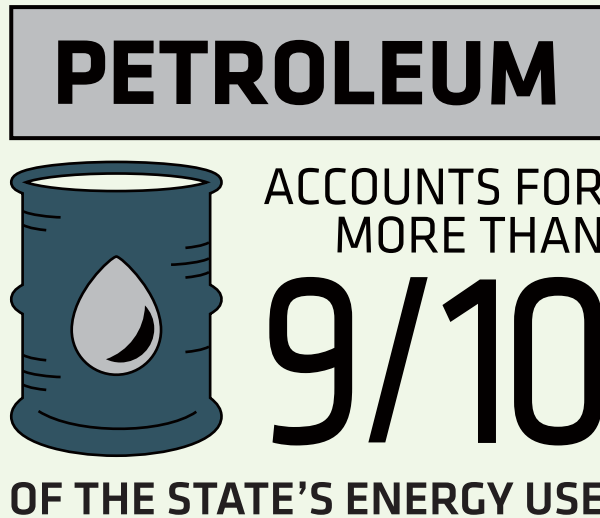
HAWAII'S  
CLEAN ENERGY VISION



## NEW WAY FORWARD

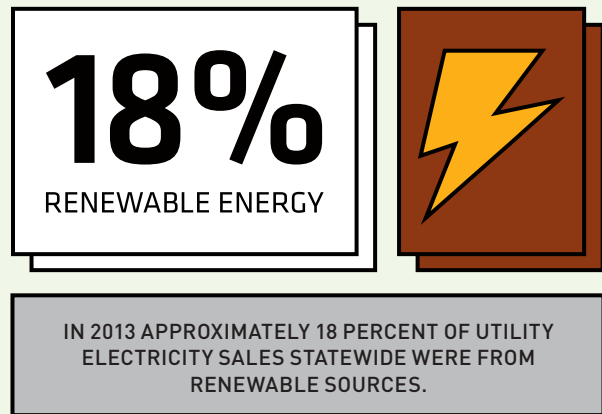
Hawaii is undergoing what is arguably the most significant energy transformation since the introduction of oil to the islands more than 100 years ago. Over that time, petroleum has grown to account for more than nine-tenths of the state's energy use, making Hawaii the most oil-dependent state in the nation by far. This lack of diversity has exposed Hawaii to rising costs and price volatility associated with imported oil, particularly in the power sector. Hawaii's per capita energy consumption is among the lowest in the nation, yet it leads the country in energy costs on a per unit basis. Compared with the national average, Hawaii residents pay roughly four times more for a synthetic version of natural gas, three times more for electricity, and 25 percent more for gasoline.

Spurred by a realization that Hawaii's over-reliance on oil is unsustainable over the long term, the state has begun a dramatic shift away from the status quo.



The new landscape is one that embraces clean energy to the fullest extent possible, putting Hawaii on the path toward greater energy, environmental and economic security. Hawaii's energy policy encourages full use of the state's diverse, abundant,

indigenous natural resources, such as solar, wind, geothermal, biomass and hydro. The state is off to a good start. In 2013 approximately 18 percent of utility electricity sales statewide were from renewable sources, putting the state ahead of its 2015 Renewable Portfolio Standards target of 15 percent. Combined with a 15.7 percent reduction in energy use through conservation and efficiency, the state is nearly halfway toward its 2030 goal of 70 percent clean energy. And there is no longer any doubt that renewable energy in Hawaii can compete favorably on price with the avoided cost of generating electricity from oil.



# CLEAN ENERGY FUTURE

Hawaii's energy transformation is forcing policy-makers to be more forward thinking as they plot the state's course into uncharted territory. Our clean energy future can be broken down into three steps:

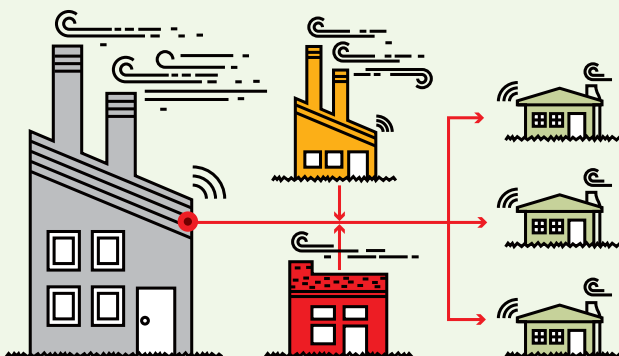
## STEP 1 - RENEWABLE ENERGY

It begins with a firm commitment to go beyond the Hawaii Clean Energy Initiative's original target of 40 percent renewable energy by 2030. It also means investing smarter in energy efficiency and realistically tackling reductions of fuel use in the transportation sector. Transportation, which accounts for two-thirds of Hawaii's energy mix, is becoming increasingly integrated with the power sector through the use of plug-in electric vehicles.



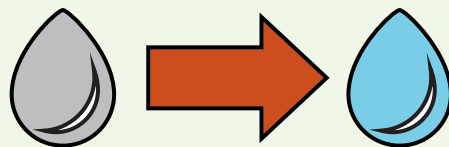
## STEP 2 - GRID OF THE FUTURE

There will be additional focus on creating integrated modern, grids that can accommodate greater amounts of renewable energy, while giving consumers more control over their energy use. Smart meters, energy storage and undersea transmission cables can all contribute to creating the grid of the future.



## STEP 3 - CLEANER AND CHEAPER TRANSITIONAL FUELS

Efficiencies can be further enhanced by cleaner and cheaper transitional fuels to support Hawaii's renewable energy goals through lower costs and more responsive, resilient generation. Cost-effective alternative fuels, such as liquefied natural gas, can provide rate relief for electric utility customers, energy security and greater utilization of renewables.



HSEO is well-situated to leading this effort. By statute, the director of the Department of Business, Economic Development & Tourism is the state's Energy Resources Coordinator (ERC), responsible for energy planning, policy and programs. The ERC has delegated that responsibility to the Hawaii State Energy Office, which is actively positioning the state as a global leader in clean energy innovation. This will be achieved through ambitious energy policies, achievements in renewable energy and efficiency installations, and growing numbers of green jobs and test bed investments.

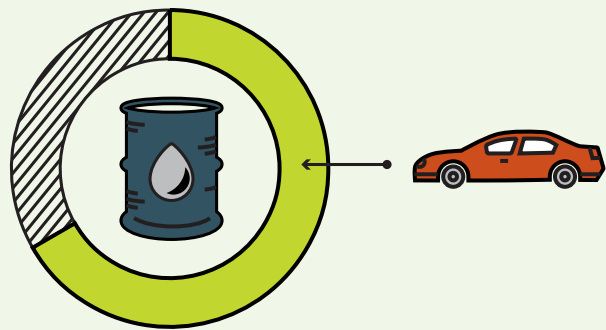
The state Legislature created the position of ERC in 1974 in response to the energy crisis fueled by the OPEC oil embargo. The legislation was codified as chapter 196 of the Hawaii Revised Statutes titled "Energy Resources." Over the years, the Legislature created 10 more statutes with dozens of subsections spelling out the duties DBEDT and/or the ERC in the energy realm, and requiring the Hawaii State Energy Office to produce numerous reports, programs and administrative rules.

## HCEI 2.0

The Hawaii Clean Energy Initiative put in place the foundational policies needed to move Hawaii away from fossil fuels and the economic drain from its dependence on imported oil. The state has begun a transition into the next phase of HCEI, which will require a fresh look at the challenges facing Hawaii. The effort will build on the work done in past years, while recommitting the state to its mission of becoming a world leader in clean energy policy, technological innovation, and alliance building. The renewed effort - dubbed HCEI 2.0 - was formally recognized recently in a Memorandum of Understanding signed on September 15, 2014 by Governor Neil Abercrombie and Energy Secretary Ernest Moniz.

The HCEI 2.0 framework encompasses a renewed emphasis on exceeding Hawaii's clean energy goals to achieve 70% clean energy by 2030, with 30% from efficiency measures and 40% from locally generated renewable sources.

A big part of HCEI 2.0 will be taking a new look at strategies to reduce petroleum use in the transportation sector. Transportation is a key part of the effort because it accounts for about two-thirds of state's oil consumption. To make a significant impact on the consumption of petroleum in Hawaii's transportation sector it is apparent that the range of solutions be expanded to alternatives such as natural gas and renewable methane, while placing a greater emphasis on the reduction of petroleum-based fuels in aviation and marine transportation. HCEI 2.0 will also continue to emphasize building an energy innovation cluster and modernizing the energy grid.



TRANSPORTATION ACCOUNTS FOR ABOUT **TWO-THIRDS** OF THE STATE'S OIL CONSUMPTION.

# MODERNIZING THE GRID

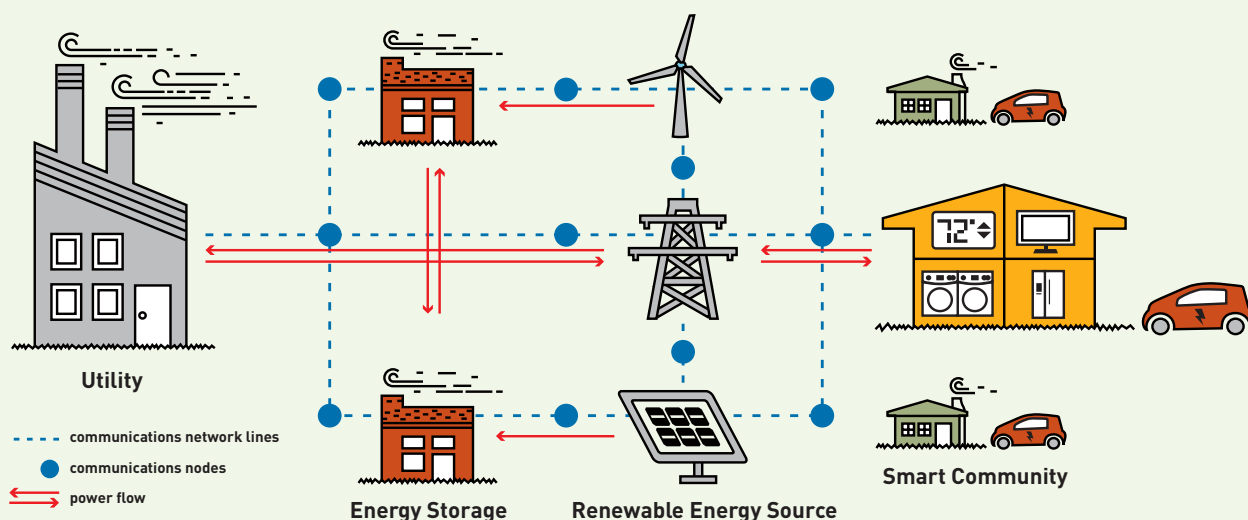
Given HCEI's goal to exceed 70% clean energy by 2030 (30% from efficiency measures and 40% from locally generated renewable resources), and as the share of energy from renewable sources steadily increases across the state, it has become clear that a modern electrical grid is needed to keep pace with the growth. A modernized grid will increase renewable capacity, improve stability and overall performance, and ultimately reduce electricity rates.

Based on a century-old model, Hawaii's electrical grids were designed to carry power from a few central generators in one direction to a large number of customers. The limitations of this model have resulted in a slowing of rooftop PV installations as Hawaii's electric utilities endeavor to manage the intermittency of distributed solar generation in highly saturated areas. In contrast, the electrical grid of the future, as envisioned under HCEI 2.0, will incorporate "smart" technology allowing for the two-way flows of electricity and information to create an advanced energy delivery network.

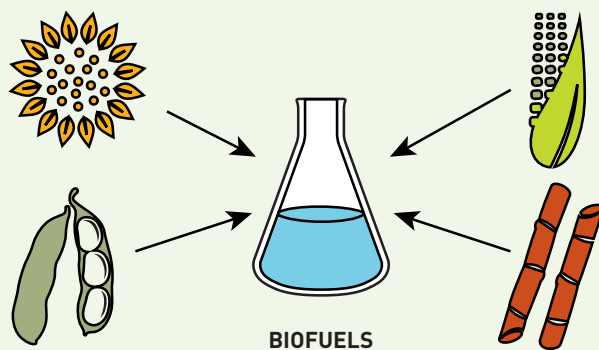
The advent of an intelligent grid will also empower energy consumers by giving them better tools to

manage their energy use. Most ratepayers today don't know how much energy they've consumed and at what cost until the end of the month when they get their bill. Smart grids will lay the groundwork for in-home energy management systems that enable ratepayers to keep track of how much energy they are using and for what purpose. Smart grids also provide utilities with the ability to charge variable rates, which can be used to incentivize consumers to shift their heavy use of electricity to times of the day when demand is low.

The efficiency of Hawaii's individual island electrical grids can be further enhanced by linking them together where appropriate, starting with a two-way undersea transmission cable between Oahu and Maui. Unifying Oahu and Maui's electrical grids allows for sharing of resources, enabling the two systems to operate more efficiently with optimal renewable energy resources and fewer redundant, unnecessary operations. The Oahu-Maui grid tie would be developed in a way that is technically and economically sound, but also sensitive to environmental and cultural concerns.



## ALTERNATIVE FUELS



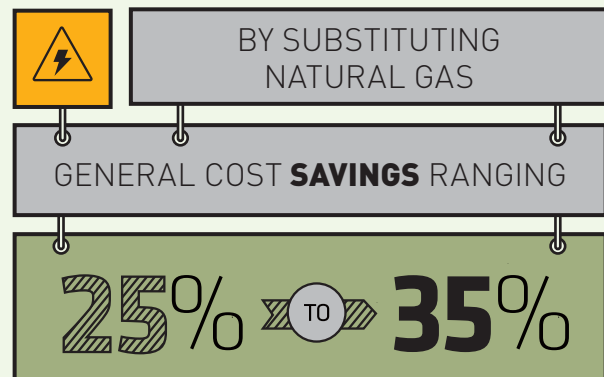
**BIOFUELS** HAVE POTENTIAL TO PROVIDE CLEAN ENERGY SOLUTIONS IN TRANSPORTATION.

Another key element to HCEI 2.0 is the use of liquefied natural gas (LNG). LNG has the potential to dramatically reduce Hawaii's electricity generating costs, serving as a bridge fuel to replace petroleum while efforts continue on the clean energy front. **Natural gas can also be deployed in the ground and marine transportation sector to help reduce consumption of petroleum. Renewable methane, hydrogen and biofuels also have potential to provide clean energy solutions in transportation.** Hyundai is already leasing its Tucson Fuel Cell vehicle in Southern California, and Toyota and Honda plan to introduce their first massmarketed fuel cell vehicles there next year. Hawaii could follow suit if budding efforts to develop a network of hydrogen fueling stations come to fruition.

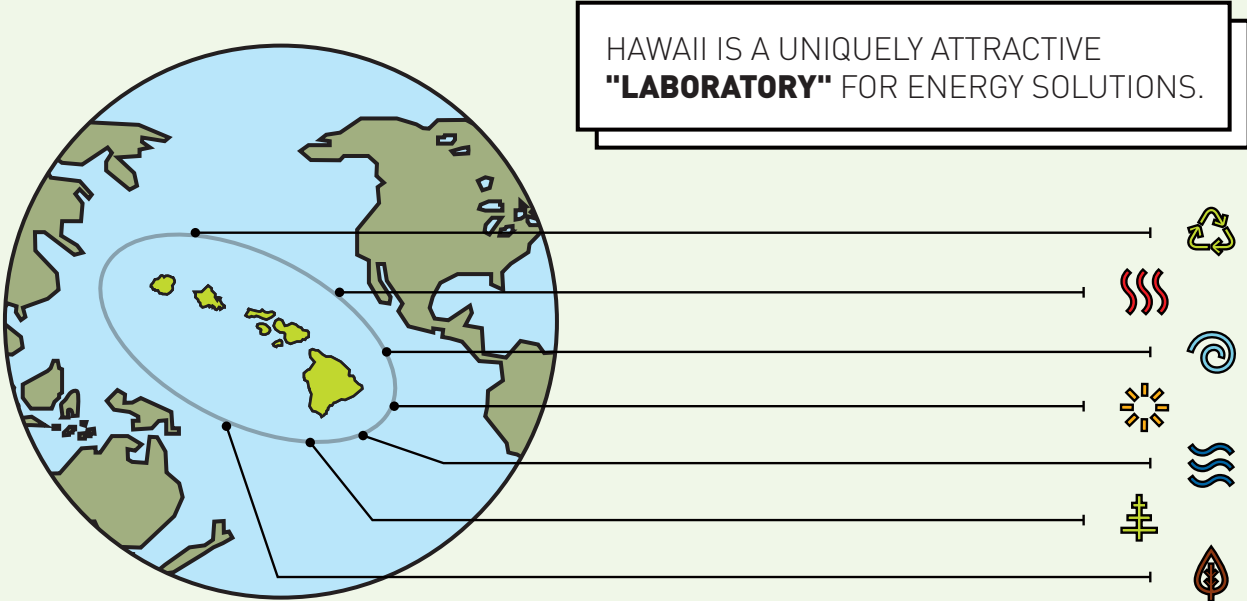
In Hawaii, there are several pilot projects underway that could pave the way for a broader deployment of hydrogen fuel cell vehicles. General Motors (GM) is testing a fleet of its Equinox hydrogen fuel cell vehicles using hydrogen produced with electrolyzers, located at three military bases on Oahu. The Hawaii Natural Energy Institute (HNEI),

which is working with GM and other partners, is also working to bring hydrogen to Hawaii Island. The Hawaii Center for Advanced Transportation Technologies, one of HNEI's partners, is retrofitting two gasoline-powered buses with electric motors powered by hydrogen fuel cells that will be used at Hawaii Volcanoes National Park.

**In the power sector, initial studies project savings in generation costs ranging from 25 percent to 35 percent by substituting natural gas for the low-sulfur fuel oil and diesel currently used for most of Hawaii's electricity generation.** Natural gas will also reduce Hawaii's dependence on oil refiners, which are already facing deteriorating economics due to declining demand and increasingly costly environmental regulations. In addition, the introduction of natural gas could spur the development of co-generation plants. This will potentially result in the creation of microgrids and a more distributed and diverse electrical generation portfolio fueled by independent power producers providing much of the generation through power purchase agreements with the utility.



# ENERGY ECOSYSTEM



HCEI 2.0 is the next phase of Hawaii's sea change in energy policy. While it presents significant challenges, HCEI 2.0 also brings tremendous opportunity. Hawaii's aggressive campaign to achieve and exceed 70 percent clean energy by 2030 has set in motion a chain of events that are helping transform the state's economy. Hawaii's isolated, island grids, high energy costs, and connections to the Asia-Pacific region make Hawaii a uniquely attractive "laboratory" for energy solutions. The state is facing grid saturation issues that will not be encountered in other locales for a decade or more. As a result, innovative companies from around the globe are coming to Hawaii looking to develop, test and prove emerging technologies and strategies in a real-world environment.

A good example of this innovation is the JUMPSmart Maui Project led by Japan's New Energy and Industrial Technology Development Organization. The collaborative project between Japan and Hawaii is exploring the nexus of smart grid and renewable energy technologies. Another important part of Hawaii's growing energy innovation cluster is the HI Growth Initiative. HI Growth, a project of the Hawaii Strategic Development Corp., in DBEDT is an equity investment program focusing on promoting entrepreneurial development, research commercialization, and access to start-up capital. HI Growth-supported investment funds work closely with the Energy Exceleator, a local incubator whose companies are working on creative solutions to some of the energy challenges facing Hawaii.

By positioning itself as a test bed, Hawaii is seeding an innovation ecosystem to spur the development of clean energy solutions while also creating high-wage jobs and economic opportunities for the people of Hawaii. It is an ecosystem that will fuel the growth of a knowledge-based economy with innovation as the primary ingredient for economic diversification.







# RENEWABLE PORTFOLIO STANDARDS IN THE NEW ENERGY ECOSYSTEM

Renewable energy sources are an integral part of Hawaii's HCEI 2.0 energy goal to reduce dependency on imported and finite sources of energy. The Renewable Portfolio Standards (RPS) are a regulation that requires the increased production of energy from renewable sources, such as solar, wind, biomass, geothermal and hydro. As we work toward the goal to exceed 40% of the state's electricity from renewable energy sources by 2030, HSEO is continuously tracking numerous metrics and indicators of our progress.

In the six years since setting our energy goals in 2008, Hawaii has made significant progress. Some major highlights include:

- **Major policy milestones included decoupling and feed-in-tariff, which have paved the way for Hawaii's utilities and power providers to shift renewable energy onto the grid.**
- **Act 195 (2012) established the regulatory structure for the installation and implementation of an inter-island cable system, which has the potential for expanded renewable energy development and related economic, environmental, and grid reliability benefits for Hawaii.**
- **Hawaii's acknowledgment of RPS, along with EEPS and other "outside of the fence-line" measures as core emissions reductions and economic development drivers, as evidenced by the Administration's implementation of greenhouse gas (GHG) rules in 2014.**
- **HSEO created a suite of online resource tools in its website under "Developer and Investor Center" designed to expedite the permitting process and reduce the soft costs associated with new projects. This one-stop resource hub provides potential developers and investors with permitting, financing, incentive, siting, and utility resources needed to initiate clean energy projects in Hawaii. The suite of tools include the Renewable Energy Permitting Wizard, Renewable EnerGIS, and Guide to Renewable Energy Facility Permits.**

- **HSEO collaborated with the U.S. Department of Energy and other local and federal agencies to complete the first of its kind Hawaii Clean Energy Programmatic Environmental Impact Statement (PEIS). This PEIS will be a useful reference for the state, county, and federal government agencies and private project developers when project-specific environmental documents are prepared. The draft PEIS was presented for public comment in the second quarter of 2014 and will be released in final form in late 2014 or early 2015.**

As a result of projects like these, Hawaiian Electric Companies and Kauai Island Utility Cooperative reported that as of December 31, 2013, on a cumulative statewide basis, they have achieved a RPS of 17.97%, which means the state has effectively surpassed the 2015 interim goal two years early.

Since 2008, Hawaii has nearly doubled its capacity of renewable energy resources. The following pages outline evidence of growth in renewable energy generation by resource, and newly installed systems. To further improve within the renewable category, HSEO is committed to several efforts that include inter-island transmission grid tie, energy planning dockets, an electrical clusters study, enhanced developer and investor tools, and more. These initiatives are critical to surpassing 40% renewable energy, and securing a clean energy future.

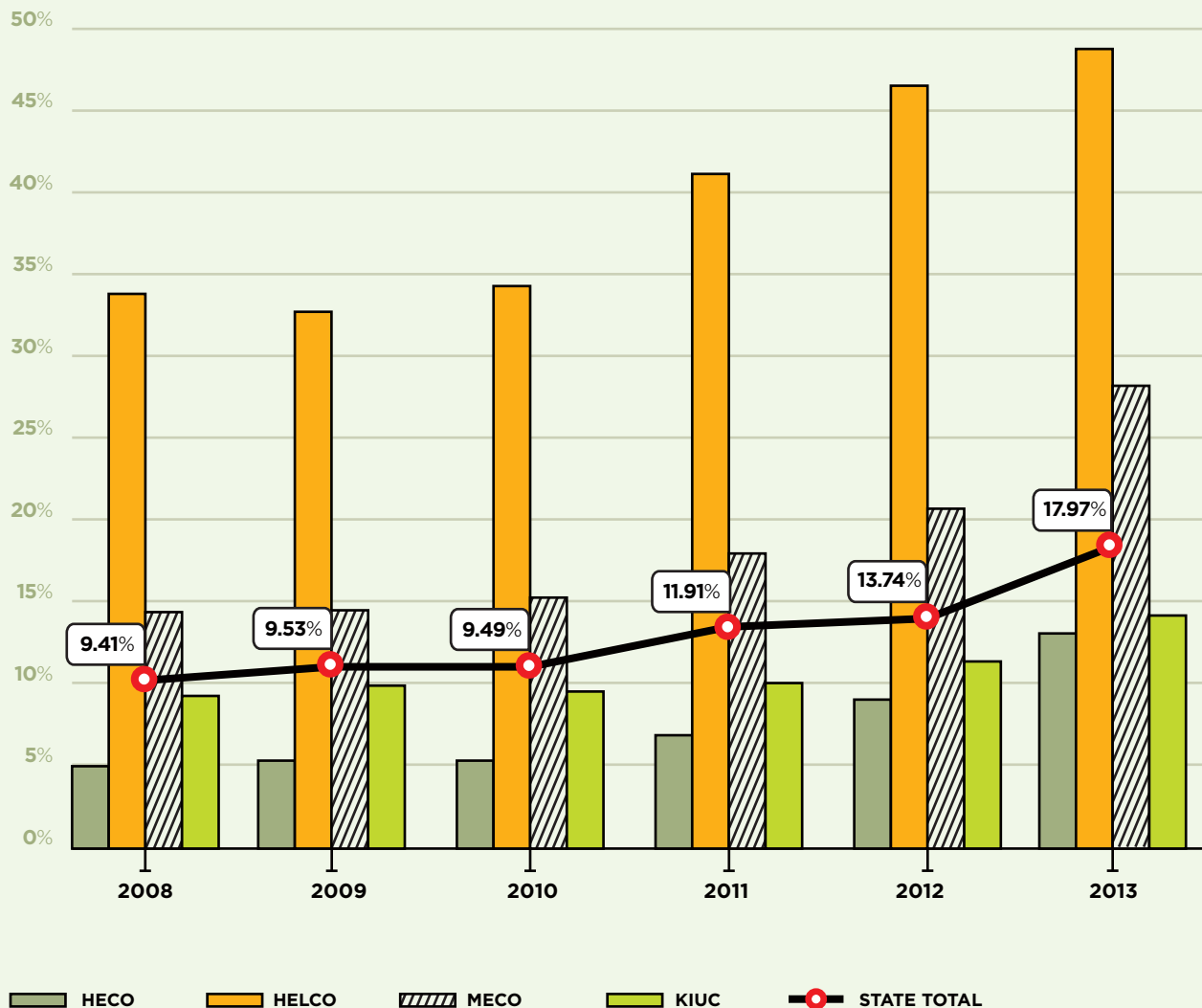
**RPS: REQUIRES THE INCREASED PRODUCTION OF ENERGY FROM RENEWABLE SOURCES.**

**GOAL: EXCEED 40% OF ELECTRICITY FROM RENEWABLE SOURCES BY 2030.**



# HAWAII RENEWABLE ENERGY PORTFOLIO STANDARDS (RPS) LEVELS

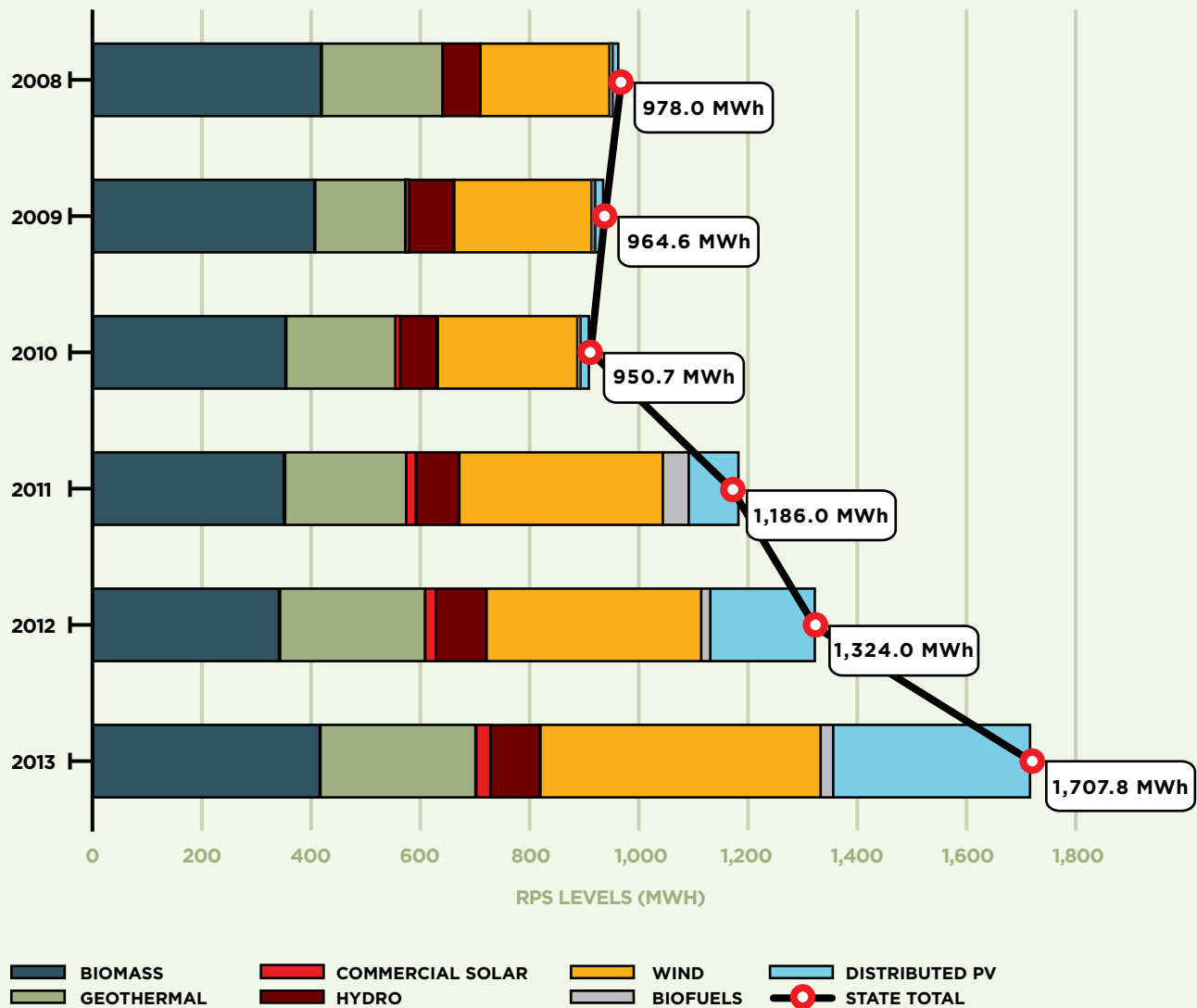
Hawaii's Renewable Portfolio Standards (RPS) levels have steadily progressed from 2008 (the year the Hawaii Clean Energy Initiative was established) through 2013. In 2013, the state's RPS level reached 17.9%, revealing Hawaii has achieved the mandated 15% RPS level two years ahead of the 2015 deadline.



SOURCE: RENEWABLE PORTFOLIO STANDARDS STATUS REPORTS, 2008 – 2013 (HAWAII PUBLIC UTILITIES COMMISSION)

# HAWAII RENEWABLE ENERGY GENERATION BY RESOURCE

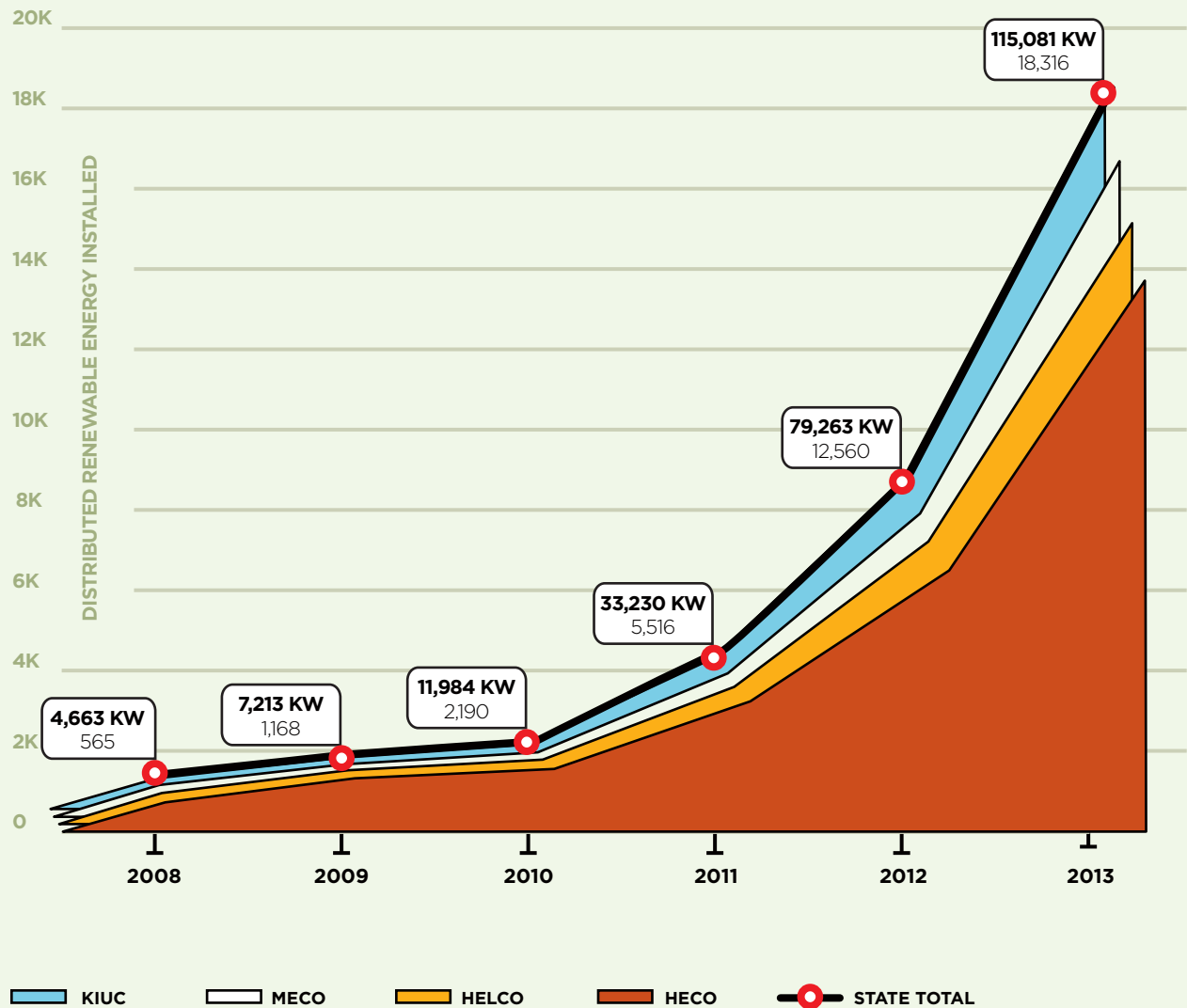
Hawaii's rich natural resources support an extremely diverse renewable energy portfolio, with increasing contributions from solar, wind, geothermal, biomass and, most notably in recent years, distributed photovoltaics (PV). The 1,707.8 Megawatt-hours (MWh) represents 18% of net electricity sales in 2013.



SOURCE: RENEWABLE PORTFOLIO STANDARDS STATUS REPORTS, 2008 – 2013 (HAWAII PUBLIC UTILITIES COMMISSION)

# NEW DISTRIBUTED RENEWABLE ENERGY SYSTEMS INSTALLED IN HAWAII

In 2013, distributed renewable energy system installations increased significantly from 12,560 in 2012 to 18,316. At the end of 2013, the cumulative number of systems statewide totaled 40,717 with a total capacity of 253.5 Megawatt (MW).



SOURCE: RENEWABLE PORTFOLIO STANDARDS STATUS REPORTS, 2008 – 2013 (HAWAII PUBLIC UTILITIES COMMISSION)

# HAWAII CLEAN ENERGY PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (PEIS)



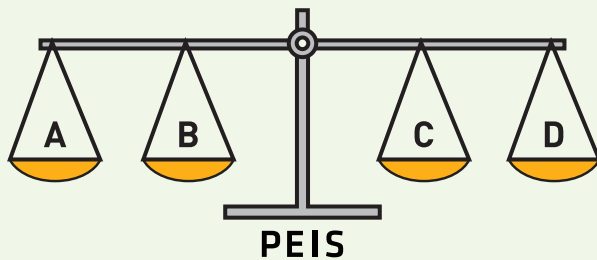
On December 14, 2010, the U.S. Department of Energy (DOE) issued a Notice of Intent (NOI) to prepare a PEIS, with the State of Hawaii (represented by HSEO) as a joint lead, on the wind phase of the Hawaii Inter-island Renewable Energy Program (HIREP) (75 FR 77859). That NOI referred to the PEIS as the "HIREP: Wind PEIS." HIREP narrowly considered wind and undersea transmission technologies between Oahu and Maui County. HSEO, in consideration of public scoping comments, its own regulatory and policy review, and consultation with DOE, decided to broaden the scope of the PEIS to include a wider range of clean energy activities and technologies with the potential for near-term development or application in Hawaii. DOE also assumed the lead for the PEIS under the federal National Environmental Policy Act (NEPA). Accordingly, the project was renamed the "Hawaii Clean Energy PEIS."

The Hawaii Clean Energy PEIS will be useful as a reference document for state, county, federal government agencies and private project developers when project-specific environmental documents are prepared. The Hawaii Clean Energy PEIS will guide the DOE in making decisions about future DOE funding and other actions to support Hawaii in achieving its HCEI objectives. The Hawaii Clean Energy PEIS serves two of our Administration's principles, namely, diversifying our energy portfolio and helping to balance technical, economic, environmental and cultural considerations.

The draft PEIS was presented for public comment in the second quarter of 2014. Public meetings were held statewide. Stakeholders and the general public were invited to submit comments on the draft document orally at the meetings, in writing and electronically. After responses are prepared to the comments, the PEIS is expected to be released in final form in late 2014 or early 2015.

**PEIS SERVES TWO PRINCIPLES:**

1. DIVERSIFY HAWAII'S ENERGY PORTFOLIO.
2. BALANCE TECHNICAL, ECONOMIC, ENVIRONMENTAL AND CULTURAL CONSIDERATIONS.



# OAHU-MAUI INTER-ISLAND TRANSMISSION GRID TIE CABLE

Connecting the islands through integrated, modern grids is one of the state's high priority strategies. By linking our islands, we will be able to utilize our best natural resources at a scale that will reduce costs and improve overall system efficiency.

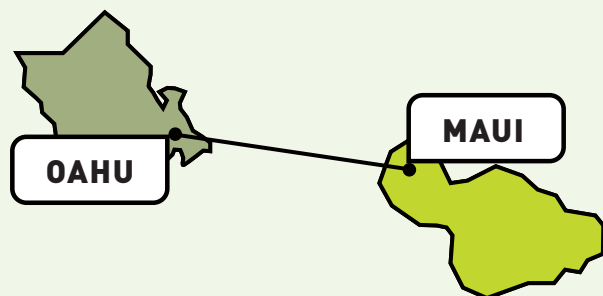
In July 2013, the Hawaii Public Utilities Commission (PUC) issued a set of decisions and orders related to renewable energy generation and an inter-island transmission grid-tie cable. Through these dockets, the PUC is investigating how to minimize risk, make the best use of existing infrastructure, and establish the most efficient and cost effective interconnected grid in the best interest of the ratepayer.

Order #31356 in docket #2013-0169, opened a proceeding to investigate whether an Oahu-Maui inter-island transmission system may be in the public's interest. The docket examines topics such as:

- Benefits and costs of an Oahu- Maui grid tie undersea cable
- Potential project-on-project risks that are anticipated and possible mitigating operational issues of the design, construction and ownership of the cable
- Regulatory and rate making policies for a potential transmission system
- The optimal path for solicitation, procurement and development if a transmission system is deemed beneficial to the public interest

**On September 9, 2013, DBEDT submitted its initial comments to the PUC, which support an inter-island transmission cable connecting Oahu and Maui grids (Cable Project). DBEDT provided the following analysis into the docket record:**

- **The Cable Project will provide economic benefits to ratepayers on both islands, saving up to \$423 million for the 2020-2050 period.**
- **The Cable Project's effective use of available, dispatchable capacity will increase reliability and**



**produce ancillary service benefits for both Oahu and Maui electric systems.**

- **The Cable Project is projected to significantly reduce projected renewable energy curtailments, particularly on Maui.**
- **The development of the Cable Project will allow for lower environmental compliance costs.**
- **The Cable Project will help the state meet its mandated Renewable Portfolio Standards goals of 40% by 2030.**
- **In its comments, DBEDT urged the PUC to deem that an inter-island cable connecting Oahu and Maui is in the public interest, and recommended that the PUC should proceed with commencing a competitive solicitation process in order to facilitate the development of an Oahu-Maui inter-island transmission system.**

In January 2014, the PUC conducted public meetings on Oahu and Maui seeking comments on the whether or not an Oahu-Maui inter-island transmission system may be in the public's interest. Pending now is the PUC's determination and guidance on next steps.

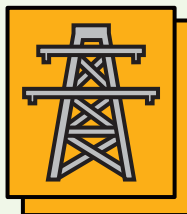
**BY LINKING OUR ISLANDS, WE WILL UTILIZE OUR BEST NATURAL RESOURCES AND IMPROVE THE OVERALL EFFICIENCY OF OUR POWER SYSTEM.**

## ENERGY PLANNING DOCKETS

On April 28, 2014, the PUC issued four decisions and orders related to Integrated Resource Planning (IRP), Reliability Standards Working Group (RSWG), Policy Statement and Order Regarding Demand Response (DR) programs, and Maui Electric Company (MECO) Rate Case Follow-Up. Amongst the required deliverables, the Hawaiian Electric Companies will be required to submit:

- **Power Supply Improvement Plans (PSIP) to address, among other things, how the capacity of the island grid may be expanded in order to accommodate additional variable renewable energy, the reduction of energy costs, and improvements in generation operational efficiencies.**
- **Distributed Generation Interconnection Plans to identify distributed circuit capacity and the utilization of technologies and mitigation measures to accommodate greater utilization of distributed energy.**
- **Integrated Demand Response Portfolio Plan (IDRPP) to consolidate their currently existing and future planned demand response programs.**

The PUC's orders challenged the Hawaiian Electric Companies to aggressively pursue energy cost reductions and proactively invest in grid and other infrastructure improvements to integrate more renewable energy, consistent with the state's energy policy directives. Fulfilling the state's clean energy commitment to go beyond 40 percent renewable energy for power generation requires a strategic approach and collaboration by the PUC and our energy stakeholders. HSEO looks forward to fully engaging in and helping to move these dockets forward.



**PUC'S ORDERS  
TO HAWAIIAN  
ELECTRIC  
COMPANIES:**

**AGGRESSIVE ENERGY  
COST REDUCTIONS**

**PROACTIVE INVESTMENT  
IN EMERGING RENEWABLE  
ENERGY INTEGRATION**



# PROACTIVE APPROACH ELECTRICAL CLUSTERS STUDY

HSEO funded (through the U.S. Department of Energy SunShot Initiative grant) the study on the progress of the innovative Proactive Approach developed by Hawaiian Electric Company (HECO). The purpose of the study is to enhance the utilities' functions of interconnection, and transmission and distribution planning in order to anticipate and plan for higher penetration levels of Distributed Generation (DG) solar energy. **The results could lead to faster, more efficient and cheaper evaluation of interconnection requests from renewable energy developers and homeowners wanting to install solar energy while remaining connected to the power grid.** The Proactive Approach was recommended by the Hawaii Reliability Standards Working Group (RSWG), PV Sub-Group, which was convened to develop policy and technical recommendations to the PUC that will facilitate the increased use of renewable energy in the islands without compromising grid reliability.

The results of the Proactive Approach study were presented to both the RSWG PV Sub-Group as well as to the SunShot Initiative peer review team. They said, "This initiative is very important, not only for the benefits it can deliver to Hawaii, but also for the benefits it can deliver to the rest of the country. Since Hawaii is facing grid integration challenges before most other states, the work it does to improve interconnection processes and standards and to resolve reliability challenges as renewable energy penetration levels increase could be shared with other states and utilities in the future. Therefore, the potential impact of this initiative is very significant, assuming the results can be effectively disseminated and applied in other states. Engagement with many local stakeholders from industry, utility, and PUCs are strengths. Understanding the impact of high-penetration solar is a key step in the continued expansion of solar on the grid."

## DEVELOPER & INVESTOR CENTER

National and international developers and investors are discovering Hawaii is the ideal laboratory for the development of clean energy technologies. The online Developer & Investor Center ([energy.hawaii.gov/developer-investor](http://energy.hawaii.gov/developer-investor)) is a dynamic resource, regularly updated by HSEO, to inform users of contemporary issues and potential solutions facing renewable energy development in Hawaii today. HSEO would like to acknowledge the input and guidance provided by many local federal, state and county agencies to improve the accuracy and usefulness of these resources.

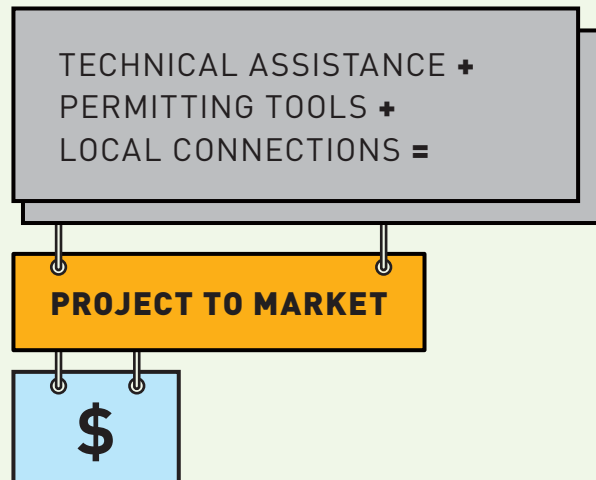
The Center provides guidance on project permitting, local utility interconnection, Hawaii business registration, project financing and local incentives, local permitting consultants, and site acquisition in Hawaii. It hosts the *Guide to Renewable Energy Facility Permits in Hawaii* and useful information (permit packets) for over 160 federal, state, and county permits, including process steps, estimated timelines and costs, agency contacts, and relevant laws and references. With support from the DOE, by the end of 2014, HSEO will have updated these resources to communicate current agency processes and preferences regarding the permitting and siting of renewable energy projects in Hawaii.

The Center links to the Hawaii Department of Health (DOH) e-Permitting Portal for online processing of DOH environmental permits and approvals such as those relating to air quality and water quality. The Portal provides transparency into DOH permitting processes and empowers DOH to electronically manage its permitting forms and databases. E-Permitting has been implemented in other states and serves as a model for other agencies considering electronic permit management.

## SELF-HELP ENERGY SUITE

The Self-Help Energy Suite is intended to decrease local electricity costs and community impacts by providing resources to help lower project development soft costs through responsible project siting and design. The suite provides developers and investors with important technical assistance, permitting tools and local connections to accelerate a project's journey to the marketplace, where the rewards will be felt statewide. HSEO created the Self-Help Energy Suite of tools to advance high impact, clean energy alternatives. In November 2013, HSEO's Renewable EnerGIS Map and Renewable Energy Permitting Wizard programs received top honors at the 2013 Hawaii Technology Excellence Awards.

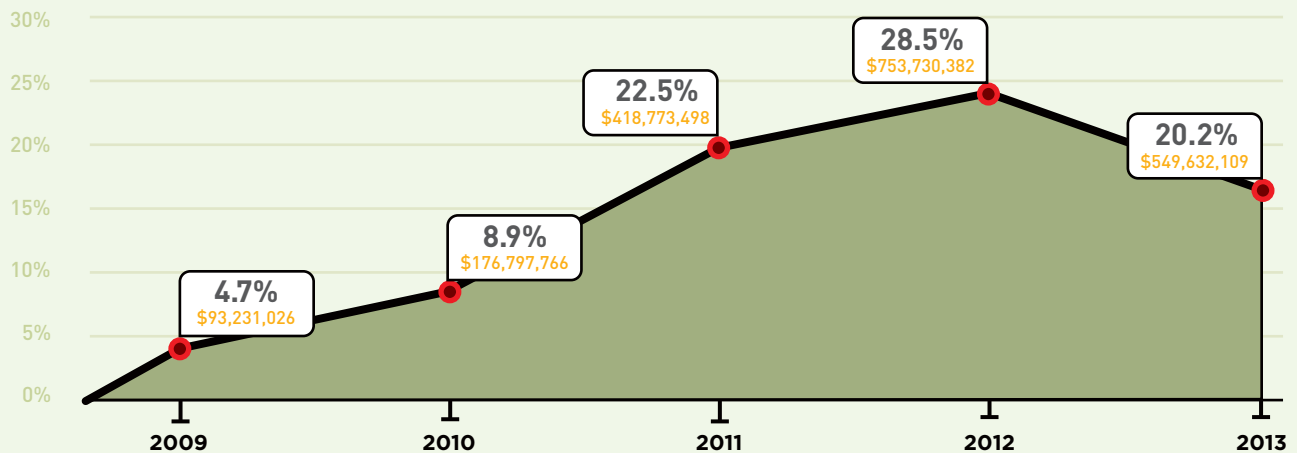
- **Renewable EnerGIS Map** ([energy.hawaii.gov/resources/renewable-energis-map](http://energy.hawaii.gov/resources/renewable-energis-map)) provides renewable energy resource and site information for specific Hawaii locations. It helps landowners, developers, and policy makers understand the renewable energy potential of sites statewide. It is currently being upgraded to increase its functionality and information provided.
- **Renewable Energy Permitting Wizard** ([wizard.hawaii-cleanenergyinitiative.org](http://wizard.hawaii-cleanenergyinitiative.org)) was developed to help those who are proposing renewable energy projects understand the county, state and federal permits that may be required for their individual project. It is currently being upgraded to reflect current permitting requirements, improve user functions, and be available in an open source software environment.
- **Hawaii Renewable Energy Projects Directory** ([energy.eHawaii.gov/epd/public/energy-projects-map.html](http://energy.eHawaii.gov/epd/public/energy-projects-map.html)) is an interactive directory to find and learn about renewable energy projects in Hawaii. The directory lists existing and proposed projects statewide, showcasing the variety of renewable energy resources that are being harnessed to move us closer to reaching our overall clean energy goal.



# SOLAR RELATED CONSTRUCTION EXPENDITURES

Hawaii's solar industry has significantly impacted on the construction industry. As of 2013, it accounted for 20.2% of all construction expenditures in the state, providing needed stimulus to the construction industry.

VALUE OF **SOLAR PROJECTS** AS % OF TOTAL BUILDING PERMIT VALUE



SOURCE: RESEARCH & ECONOMIC ANALYSIS DIVISION, DBEBT

# RENEWABLE ENERGY PROJECT DEVELOPMENT

The following utility-scale renewable energy project is on target to be operational in 2014:

Honolulu International Airport Emergency Power Facility (8-10 MW)

# HAWAII NATIONAL RANKINGS

Hawaii is a recognized energy leader, earning recognitions in PV installations and EV penetration.

**1<sup>st</sup>** Per Capita Top Ten U.S. States Ranked by Grid-Connected PV Cumulative Installed Capacity per Capita ( $W_{dc}/person$  through 2013) *Interstate Renewable Energy Council's (IREC) U.S. Solar Market Trends 2013*

Honolulu: First in Nation 2013 The "Solar Stars" (Cities with more than 50 watts of installed solar PV capacity per person, end of 2013) *Environment America Research & Policy Center's "Shining Cities: At the Forefront of America's Solar Energy Revolution"*

2013 Installed Solar PV Capacity *Clean Edge 2014 U.S. Clean Tech Leadership Index*

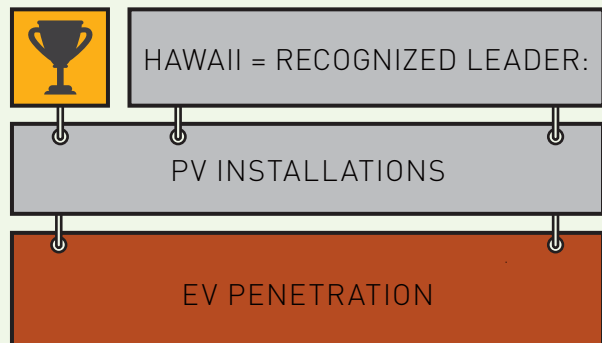
**2<sup>nd</sup>** EVs Registered *Clean Edge 2014 U.S. Clean Tech Leadership Index*

**5<sup>th</sup>** Honolulu: Top 20 Solar Cities by Cumulative Installed Solar PV Capacity, End of 2013 *Environment America Research & Policy Center's "Shining Cities: At the Forefront of America's Solar Energy Revolution"*

**6<sup>th</sup>** 2013 PV Installations by State *Solar Energy Industries Association's (SEIA) 2013 U.S. Solar Market Insight Report, Year-In-Review*

2013 Annual Top Ten U.S. States Ranked by Grid-Connected PV Capacity Installed in 2013 *Interstate Renewable Energy Council's (IREC) U.S. Solar Market Trends 2013*

**8<sup>th</sup>** Cumulative Top Ten U.S. States Ranked by Grid-Connected PV Cumulative Installed Capacity though 2013 *Interstate Renewable Energy Council's (IREC) U.S. Solar Market Trends 2013*





# ENERGY EFFICIENCY PORTFOLIO STANDARDS IN THE NEW ENERGY ECOSYSTEM

While Hawaii's new energy ecosystem requires innovation in renewable energy, just as significant are Energy Efficiency Portfolio Standards (EEPS) which guide the state's cost effective use of energy. These standards require service providers to meet a portion of their annual increase in electricity demand through energy efficiency measures. Intent on reducing electricity demands by 2030, HCEI 2.0's overall goal for energy efficiency is to meet or exceed the Energy Efficiency Portfolio Standards of 4,300 gigawatt-hours (GWh) by 2030, or a 30 percent reduction in electricity use from 2007 levels.

To meet this goal, the state continues to:

- **Align the efficiency regulatory policy framework with clean energy goals**
- **Support the retrofitting of existing residential and commercial buildings**
- **Strengthen new construction policies and building codes**
- **Identify non-building related energy efficiency measures**

Increasing energy efficiency in Hawaii has been greatly aided by technological advancements in solar hot water heating, lighting and Energy Star-certified heat and cooling appliances.

Energy performance contracting is also a vital component to ensuring these products integrate well with existing systems. This style of contracting allows for building owners and private energy service companies to utilize future operational costs savings (such as for annual: electricity, water, sewer or solid waste charges, as well as equipment maintenance service contracts) to pay for the entire cost of a building's energy and water efficiency retrofits.

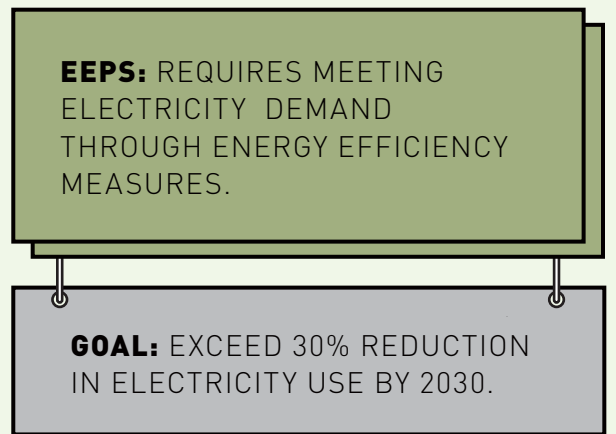
Our GreenSun Hawaii and Hawaii Green Business programs have inspired statewide energy efficiency activities by leveraging these advancements. For instance, the GreenSun Program authorized 42

contractors and facilitated 125 loans for energy retrofits and improvements.

HSEO also recognized many green businesses this year for their leadership in the areas of energy efficiency and sustainability. Since 2009, their efforts have netted over 11 million kWh of energy.

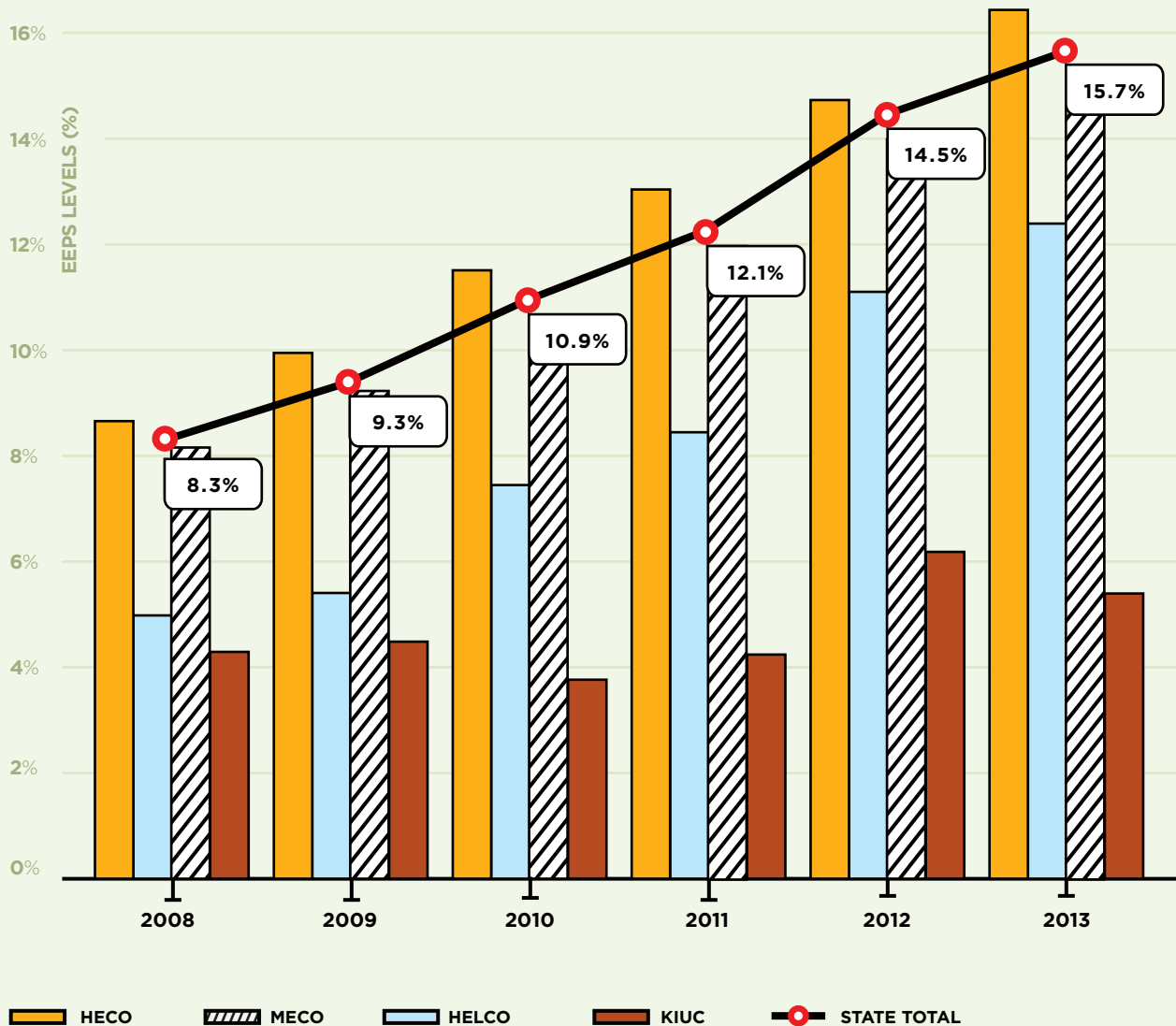
As a result of energy efficiency measures to date, Hawaii has already made great strides toward its 30% energy efficiency goal. This means that the dollars businesses and households save on energy can be reinvested into the economy.

Looking ahead, many opportunities remain for energy efficiency. Hawaii aims to maximize efficiency through technology, building practices, retrofits, and consumer behavioral change.



# HAWAII ENERGY EFFICIENCY PORTFOLIO STANDARDS (EEPS) LEVELS

Hawaii's Energy Efficiency Portfolio Standards (EEPS) levels have made steady gains from 2008 (the year the Hawaii Clean Energy Initiative was established) through 2013. In 2013, the state's EEPS level was 15.7 percent. The state is required to reduce energy consumption through efficiency measures by 30 percent by the end of 2030.



SOURCE: RENEWABLE PORTFOLIO STANDARDS STATUS REPORTS, 2008 – 2013 (HAWAII PUBLIC UTILITIES COMMISSION)

# ENERGY PERFORMANCE CONTRACTING – RACE TO THE TOP



For the third year in a row, Hawaii was ranked first in energy performance contracting (EPC) in the nation by the Energy Services Coalition (ESC).

Hawaii’s investment of \$235.74 per capita earned the state a third consecutive ESC Race to the Top award in 2014. The award recognized Hawaii for its outstanding commitment to energy efficiency, environmental stewardship and economic development through EPC.

| ENERGY SERVICES COALITION – RACE TO THE TOP |            |                         |                    |                   |                     |                     |
|---|------------|-------------------------|--------------------|-------------------|---------------------|---------------------|
| STATE                                       | POPULATION | PERFORMANCE CONTRACTING | DOLLARS PER CAPITA | JOB YEARS CREATED | SOURCE ENERGY SAVED | TONS CARBON AVOIDED |
| Hawaii                                      | 1,360,301  | \$320,678,850.00        | \$235.74           | 3,486             | 2,660,993           | 45,708              |
| Delaware                                    | 897,934    | \$138,707,463.00        | \$154.47           | 1,508             | 1,150,994           | 19,771              |
| Ohio  | 11,536,504 | \$1,252,683,627.00      | \$108.58           | 13,616            | 10,394,769          | 178,551             |
| Kansas                                      | 2,853,118  | \$278,951,861.00        | \$97.77            | 3,032             | 2,314,742           | 39,760              |
| Colorado                                    | 5,029,196  | \$447,377,551.00        | \$88.96            | 4,863             | 3,712,338           | 63,767              |

**SOURCE:** Energy Services Coalition, Performance Contracting Impacts - State Comparison

EPC is an innovative approach to implementing energy and water efficiency measures using guaranteed energy savings to pay for the projects. EPC can provide government agencies with much needed updated energy efficiency improvements as well as deferred maintenance relief. By including deferred maintenance and performance period maintenance services with all this under a single contract and with guaranteed savings measures, agencies can maximize their investments.

HSEO has been leading the state’s award-winning EPC efforts since 1996. HSEO provides technical assistance to state and county agencies, including analysis of energy savings measures, review of financing documents, and advice on agency-specific issues. To date, HSEO has provided technical assistance to:

- University of Hawaii at Hilo
- Hawaii Health Services Corporation
- City and County of Honolulu’s four city buildings and Kailua Wastewater Treatment Facility
- County of Hawaii
- County of Kauai
- The Judiciary
- Department of Accounting and General Services (DAGS)-Phase I-10 large office buildings
- University of Hawaii Community Colleges
- Department of Public Safety’s four large facilities
- Department of Transportation-Airports
- DAGS Phase II -33 buildings

Technical assistance for ongoing or proposed projects includes the following:

- The University of Hawaii at Hilo-Phase 2
- Board of Water Supply’s water pumping facilities





# STATE AND COUNTY PERFORMANCE CONTRACTING

HSEO provides technical assistance to state and county agencies that are using energy performance contracting (EPC). This chart illustrates the number of EPC projects conducted by state and county agencies from 1996 through 2014. Looking ahead, the state anticipates additional investment through EPC. HSEO is working with the following agencies for additional projects:

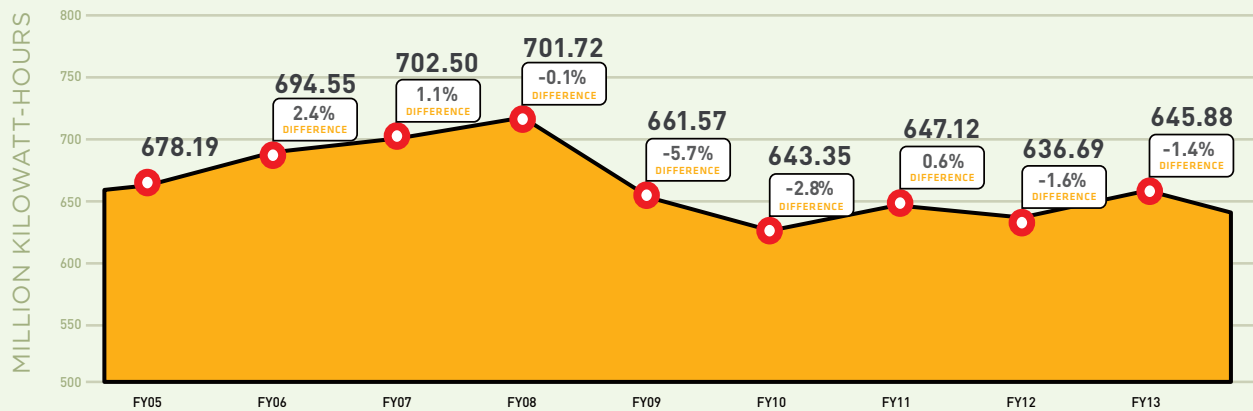
- Department of Transportation - Harbors and Highways Divisions
- University of Hawaii - Hilo, Phase II
- City and County of Honolulu's Board of Water Supply
- Hawaii Health Services Corporation-Phase 2
- Department of Defense

These projects are expected to create direct and indirect jobs, from engineers and building operators to equipment installers and building maintenance operators.

| HAWAII STATE AND COUNTY ENERGY PERFORMANCE CONTRACTS   |           |                      |  |
|--|-----------|----------------------|--|
| AGENCY   | YEAR(S)   | CONTRACT AMOUNT (\$) | ESTIMATED SAVINGS OVER LIFE OF CONTRACT (\$) |
| UH-Hilo  | 1996      | \$6,402,695          | \$14,630,066                                 |
| County of Hawaii                                       | 1997-2006 | \$2,215,546          | \$8,157,880                                  |
| County of Kauai  | 1998-2006 | \$525,965            | \$1,205,990                                  |
| C&C of Honolulu  | 2001-2005 | \$11,900,205         | \$36,066,761                                 |
| Hawaii Health Systems Corporation                      | 2001-2005 | \$22,542,969         | \$55,766,365                                 |
| Judiciary  | 2003      | \$1,474,406          | \$9,785,036                                  |
| Department of Accounting and General Services Phase I  | 2009      | \$33,902,962         | \$56,149,562                                 |
| Department of Public Safety                            | 2011      | \$25,511,264         | \$46,000,000                                 |
| University of Hawaii Community Colleges                | 2011      | \$32,802,838         | \$90,064,000                                 |
| C&C Honolulu   | 2013      | \$16,000,000         | \$34,000,000                                 |
| Department of Accounting and General Services Phase II | 2013      | \$17,400,000         | \$28,000,000                                 |
| Department of Transportation                           | 2013      | \$150,000,000        | \$518,025,760                                |
|  | TOTAL     | \$320,678,850        | \$897,851,420                                |

## LEAD BY EXAMPLE INITIATIVE

This graph demonstrates the amount of electricity Hawaii state agencies have consumed from fiscal years 2005 through 2013. The state's Lead by Example (LBE) initiative began in 2006 in response to legislative and executive mandates to incorporate energy and resource efficiency and conservation in government buildings, fleets and personal practices. With 2005 as a baseline year, electricity consumption declined in fiscal year 2008 and continued for three years. Overall, state agency electricity consumption has declined 4.8 percent from the baseline year.



SOURCE: FY13 LEAD BY EXAMPLE REPORT TO THE 2014 HAWAII STATE LEGISLATURE

# GREENSUN HAWAII



To help Hawaii property owners (single and multi-family, nonprofit and businesses) make energy efficiency and renewable energy retrofits to their homes, apartment complexes and facilities, HSEO created GreenSun Hawaii, a credit enhancement program funded by a \$4.38 million U.S. Department of Energy grant under the American Recovery and Reinvestment Act of 2009.

Administered by the Hawaii Community Reinvestment Corporation (HCRC), the program provides local financial institutions with access to a loan loss reserve (LLR) which may cover up to 100% of actual losses, enabling participating lenders to extend loan availability to a larger pool of customers and offer more aggressive rates and terms.

GreenSun Hawaii can finance ENERGY STAR® refrigerators and air conditioning systems, solar thermal hot water systems, heat pumps, insulation installed with an ENERGY STAR® rated air conditioner, and solar electric photovoltaic (PV) systems for residential purposes. For non-residential purposes, the loan can be used to finance lighting and air conditioning retrofits and upgrades; solar thermal and PV systems; energy efficiency windows, cool roofs and other installations eligible for Hawaii Energy/Kauai Island Utility Corporation rebates; and loan related fees.

Since GreenSun Hawaii's inception in 2011, the program has resulted in:

- **12 participating lenders and 42 authorized contractors statewide**
- **125 loans, which aggregate to over \$3.4 million in capital deployed**
- **An estimated energy savings of 1,017,071 kWh/year (20.3 million kWh over the life of the installations, which is equivalent to powering 2,756 homes for one year in Hawaii)**
- **An annual electricity bill savings in excess of \$452,000 (\$9.0 million over the life of the systems)**
- **A CO2 reduction of 1,530,000 lbs./year (30.6 million lbs. over the life of the installations)**

## HAWAII GREEN BUSINESS PROGRAM



The state's Hawaii Green Business Program assists and recognizes businesses that strive to operate in an environmentally, culturally and socially responsible manner. As a partnership between the state's Department of Health and the Department of Business, Economic Development and Tourism; the Board of Water Supply; and the Chamber of Commerce of Hawaii, the program recognizes businesses that are committed to going green by implementing energy and resource efficiency practices. Not only does energy efficiency keep utility costs down and

create a more sustainable environment, the businesses are also collectively contributing to Hawaii's energy efficiency goal.

From 2009-2013, the program has assisted and recognized over 80 business and government entities, from hospitality, commercial office, retail, restaurant and food services, resulting in the following savings:

- **11,259,760 million kWh of energy (equivalent to powering 1,525 homes for one year in Hawaii)**
- **46.93 million gallons of water**
- **\$2.5 million of energy costs**

## HAWAII NATIONAL RANKINGS

Hawaii is a recognized energy efficiency leader, earning recognition in efficient buildings.

**1<sup>st</sup>** Energy Performance Contracting *Race to the Top Energy Services Coalition*

**9<sup>th</sup>** LEED Green Building *U.S. Green Building Council LEED Green Buildings*



## BUILDING AN INNOVATIVE ENERGY ECOSYSTEM

Meeting HCEI 2.0's energy goals require high impact solutions to accelerate progress during periods of strategic opportunity. In the past year, HSEO built several specialized programs to support progress in the new energy ecosystem. These programs included a renewable energy financing, stabilization of conventional fuel sources, aggressive monitoring of greenhouse gas emissions, and energy assurance during emergency situations. The intent of the programs and associated efforts is to provide a platform for future progress toward our energy goals.

## HCEI 2.0 LOOKING FORWARD

The Hawaii Clean Energy Initiative (HCEI) was established in 2008 as a bold policy agenda and coalition of energy stakeholders. Aggressive goals were set to:

- **Achieve 70% clean energy for Hawaii by 2030, with 40% from locally generated renewable resources and 30% from efficiency measures;**
- **Reduce the use of petroleum in ground transportation by 70%, or approximately 385 MGY (Million Gallons per Year) by 2030;**
- **Increase Hawaii's energy security;**
- **Capture the many economic benefits of clean energy for all levels of society;**
- **Foster and demonstrate Hawaii's innovation;**
- **Build and broaden Hawaii's workforce for the future; and**
- **Serve as a clean energy model for the U.S. and the world.**

Since the establishment of HCEI, HSEO has implemented many of the foundational policies and innovative solutions needed to reduce our dependency on foreign oil, maximize our diverse portfolio of natural resources, and create employment and investment opportunities throughout the islands. Our state has earned many recognitions as a clean energy leader. As we move forward, we must continue to embrace innovative technologies and thoughtful decision-making.

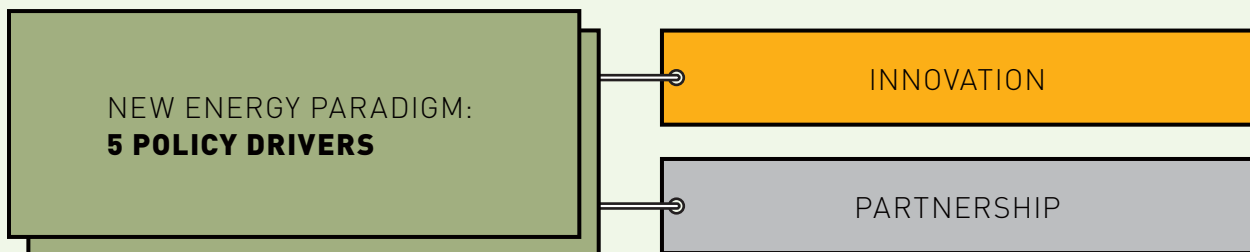
The new energy paradigm is driven by renewed policy directives established by the Abercrombie Administration. In short, our 21st century energy agenda is based on the following five policy drivers:

- 1. Diversifying our energy portfolio**
- 2. Connecting the islands through integrated, modernized grids**
- 3. Balancing technical, economic, environmental and cultural considerations**
- 4. Leveraging our international status as a clean energy test bed**
- 5. Allowing the market to pick winners**

Significantly, we are already meeting many of our goals. Hawaii currently enjoys a robust clean energy industry. Innovation is accelerating at a rapid rate, which in turn stimulates our economic growth. For example, the state is making exciting headway in the clean transportation sector. Transportation is a key part of the state's efforts because it accounts for about two-thirds of our oil consumption. We are actively looking at ways to improve the efficiency of Hawaii's vehicles, reduce the overall number of vehicle miles traveled, expand the use of renewable fuels for transportation, accelerate the deployment of electric vehicles and related infrastructure, and reduce petroleum-based fuels in the transportation sector (ground, marine and aviation). Presently, there are over 2,821 electric vehicles on Hawaii's roads, supported by over 405 publicly available charging stations statewide.

In renewable energy deployment, we're investing in smart infrastructure and exploring next generation technologies. By harnessing power from resources such as solar, wind, geothermal, hydro, ocean, biomass and biofuels, Hawaii reached an important new milestone, generating a record 17.97% of our energy from renewable resources in 2013. In the same year, the state also reduced overall energy consumption by 15.7%.

DBEDT, in partnership with the federal government and the private and non-profit sectors, has worked to fund catalytic investments that have encouraged outside investment in test projects throughout the state. The interdisciplinary group is comprised of state, industry and various private sector and non-profit leaders to share perspective and vision from our broader community. Through the collaborative efforts of these stakeholders, opportunities are sought out to overcome obstacles in the way of our energy goals.



## GREEN ENERGY MARKET SECURITIZATION (GEMS)

On June 27, 2013, Gov. Neil Abercrombie signed into law Act 211, which establishes a green infrastructure financing program. Named GEMS or Green Energy Market Securitization, the innovative financing model is designed to make clean energy improvements, such as solar photovoltaic installations, affordable and accessible for Hawaii's consumers, including expanding the market to reach underserved markets such as lower credit homeowners, renters and nonprofits. It aims to address the financial barriers of investing in and installing energy cost savings devices.

GEMS takes a proven rate-reduction bond structure to provide low-cost financing to enable consumers to invest in clean energy installations. Payment for the devices would be made over time through one's electricity bill and paid for through the energy savings.

On June 6, 2014, DBEDT filed two applications with the Hawaii Public Utilities Commission for approval to issue up to \$150 million in GEMS bonds and use bond proceeds to provide financing to consumers for solar photovoltaic systems and other eligible clean energy technologies. The orders were approved by the Commission on September 4 and 30, 2014, clearing the way for the program to move forward to its implementation phase, which included issuing GEMS bonds, constituting the Green Infrastructure Authority, and deploying \$150 million in bond proceeds through the GEMS program.

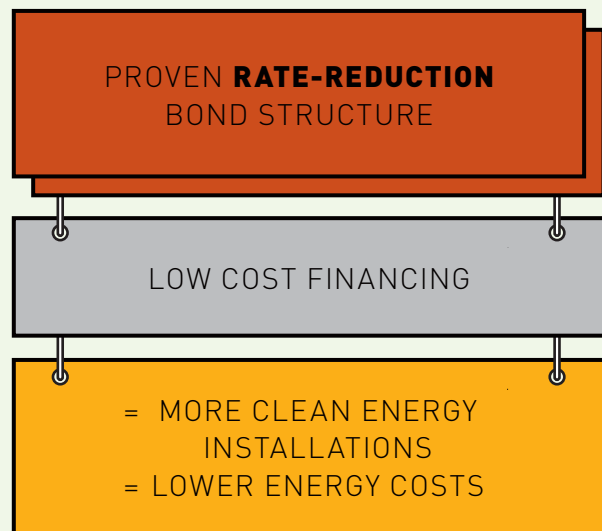
DBEDT successfully closed its \$150 million bond issuance in November 2014. The issuance was rated AAA by Standard & Poor's Ratings Services, Moody's Investors Service, and Fitch Ratings. It is the first AAA rated issuance by the State of Hawaii and is the lowest cost-capital accessible by the state in the bond markets at the time of issuance.

The Hawaii Green Infrastructure Authority is responsible for working with deployment partners such as financial institutions, solar developers, and local installers to deploy the \$150 million in bond proceeds to finance solar PV systems for Hawaii

consumers. The GEMS program officially started in December 2014, and Hawaii consumers will have the opportunity to finance their solar PV systems through the GEMS program until December 2016, when the program is expected to deploy all funds.

The GEMS program has already been recognized for its innovation by the Council of Development Finance Agencies (CDFA) 2014 Excellence in Development Finance Award.

Please refer to the Annual Report to Legislature on the Status of the Green Infrastructure Authority's Activities for more information on GEMS.





# STABILIZATION OF HAWAII'S CONVENTIONAL FUEL BASE

While HSEO is committed to achieving a clean energy future, it also has a role in advising the Governor on measures, alternatives and actions that the state should consider in a future fuels ecosystem to maintain adequate and affordable fuel supplies to meet the state's energy needs.

Working with energy stakeholders, the state has been taking significant steps to reduce vulnerabilities in Hawaii's fuel supply infrastructure which could lead to supply and price disruptions in the event that one or both of Hawaii's refineries are closed.

As promised in his 2013 State of the State address, Governor Abercrombie established the Hawaii Refinery Task Force by executive order to assess the potential impacts to changes in Hawaii's refining capacity and to provide advice and recommendations on matters involving a future fuels ecosystem. Composed of 30 members from federal and state agencies, as well as elected officials and profit and nonprofit organizations, the Task Force's mandate included identifying strategies and actions that the state should consider to promote a smooth and stable transition to meet Hawaii's energy needs as our fuels market evolves.

The Task Force's reports, available on the HSEO website ([energy.hawaii.gov/hawaii-refinery-task-force](http://energy.hawaii.gov/hawaii-refinery-task-force)), found a number of measures that are already helping state policymakers take action to secure Hawaii's future energy supply:

- **Governor Abercrombie signed Act 64 (2014) to modernize Hawaii's outdated gasoline specification.**
- **Refinery closure scenarios are being incorporated into the Kalaeloa Barbers Point Harbor planning processes.**
- **A prioritization process is being developed for ensuring delivery of jet fuels at Pier 51.**

The Final Report also raised a number of longer-term challenges that the state must address:

- **While the Hawaii Clean Energy Initiative (HCEI) is significantly reducing the state's use of fossil fuels for electricity generation, much more will need to be done to reduce this reliance on fossil fuel for transportation.**
- **The gradual phase out of fossil fuels and the further development of renewable, bioenergy, liquefied natural gas (LNG), and a connected state power grid over the coming decade will require careful planning to ensure stability of the grid.**
- **Given the complexity and urgency of these issues, there may be need for establishment of a designated coordinated entity to ensure alignment of state policy and actions around conventional fuels, as part of the state's overall energy strategy.**

HSEO is responding to these challenges to ensure that changing conditions such as refinery closure potential, developing patterns of growing renewable supply and LNG imports, and evolving natural and man made threats are addressed in a comprehensive and systematic way. This includes assessing the existing Hawaii Energy Assurance Plan to determine what changes may be needed as Hawaii's energy supply profile transforms over the next decade.

# GREENHOUSE GAS EMISSIONS AND CLEAN AIR ACT COMPLIANCE

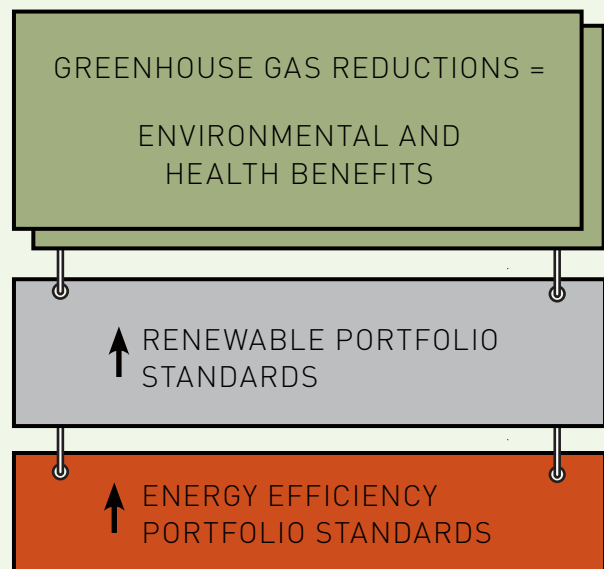
Climate change caused by increasing and dangerous levels of greenhouse gases (GHGs) in the atmosphere poses a significant risk to the citizens of Hawaii due to the potential harmful effects of rising temperatures and sea levels. HSEO understands the critical importance of reducing these emissions for the health, well-being and prosperity of Hawaii's citizens, and as such, is working with the Hawaii Department of Health (DOH), the Hawaii Public Utilities Commission (PUC), Consumer Advocate (CA), and the U.S. Environmental Protection Agency (EPA) to implement state and federal greenhouse gas emissions reduction measures.

Under Hawaii Act 234, HSL 2007 the state has developed and enacted rules to monitor and cut GHG emissions to 1990 levels or below. Hawaii's GHG rules recognize the interconnected, interdependent nature of the electric power system and the wisdom of using cost-effective abatement measures "outside the fence-line" that also have the benefit of driving innovation, investment and job creation. HCEI implementation is and will continue to drive compliance with Act 234. In fact, the state is projected to not only meet the 1990 baseline goal, but to significantly exceed it. Recognizing the serendipitous environmental benefits of our renewable energy policies, HSEO worked with DOH and the PUC, to ensure that the aggregate CO2e emission reductions inherent in HCEI implementation were acknowledged (and accounted for) in Hawaii's Act 234 compliance scheme.

As such, Hawaii's GHG rules reinforce the use of renewable energy and energy efficiency measures under the Hawaii Clean Energy Initiative (HCEI) as core emissions reduction and economic development drivers.

On June 2, 2014, the EPA released its proposed Clean Power Plan to reduce CO2 emissions at existing power plants under Section 111d of the Clean Air Act. Hawaii supports the flexible, system-based approach contained in the plan, and in particular, its critical reliance on renewable energy and energy efficiency as key compliance mechanisms. Indeed, the state is a shining national

example of how renewable portfolio standards (RPS) and energy efficiency portfolio standards (EEPS) provide the fulcrum for driving both environmental and economic development. HSEO continues to coordinate with DOH, PUC, and CA to provide its unique energy and economic expertise, as the state interfaces with the EPA and develops its compliance plans.



# HAWAII'S ENERGY ASSURANCE PROGRAM

HSEO leads the state's efforts to ensure a robust, secure, and resilient energy infrastructure in the contemporary energy ecosystem. HSEO works closely with State Civil Defense/Hawaii Emergency Management Agency, the U.S. Department of Energy, County Civil Defense Agencies, and dozens of government and energy industry emergency management and security partners to:

- **Strengthen energy emergency preparedness and response actions and capabilities;**
- **Educate stakeholder groups on energy sector inter-dependencies and challenges prior to, during, and after any disruption;**
- **Facilitate effective incident communication and information sharing between key government representatives, energy industry representatives, and the public;**
- **Address the protection of critical energy infrastructure and the means by which its resilience can be enhanced; and**
- **Develop and maintain energy assurance plans and procedures in line with existing federal, state, and local governments' frameworks, structures, and statutes.**

## 2014 Energy Assurance Activities and Programs

HSEO is the lead agency for Emergency Support Function #12 (ESF-12), which is intended to facilitate the restoration of damaged energy systems and components when activated by the Hawaii Emergency Management Agency (HI-EMA) for incidents requiring a coordinated state response. For example, HSEO assisted in the preparations, response, and recovery efforts for Hurricane Iselle in August 2014 by coordinating the state's energy response effort, helping to:

- **Deploy eight responders in rotating shifts to the State Emergency Operating Center to serve as energy advisors and liaisons, handling issues and policy decisions relating to energy response and restoration efforts.**
- **Issue situation reports providing situational assessment of the impacts to and restoration activities of the electricity, oil, and gas sectors following Iselle.**
- **Participate in daily coordination calls with energy sector companies days before the tropical cyclone struck Hawaii Island to assess potential needs and help ensure prioritization of any repairs and power restoration to critical infrastructure.**
- **Coordinate with numerous emergency management stakeholders to eliminate roadblocks and identify choke points in power and fuel distribution systems.**





## PROMOTING CLEAN ENERGY INNOVATION

Progress in clean energy has established Hawaii as one of the world's leading test beds for energy innovation. Hawaii's unique location and abundant resources provide a setting for clean energy innovation and an international test bed for promising clean and reliable technologies. Entrepreneurs from around the world are helping to secure Hawaii's energy future by developing innovative technologies that can be deployed in communities statewide. To help maximize this potential, HSEO is providing developers and investors with important technical assistance, permitting tools and local connections to accelerate a project's journey to the marketplace, where the rewards will be felt statewide. Hawaii's isolated, island setting has attracted entrepreneurs from around the world, looking to develop, test and prove emerging technologies and strategies before going to market.

## TEST BED AND INNOVATION INITIATIVES



The HI Growth Initiative, part of the Hawaii Strategic Development Corporation, is a State equity investment program designed to catalyze the development of an innovation ecosystem. HI Growth Initiative investment efforts focus on promoting 1) entrepreneurial development; 2) research commercialization; and 3) access to startup capital.

The program partnered with local entrepreneurs to establish two venture accelerators that will enhance entrepreneurial capacity in the state and create a stronger, higher quality of deal flow that can attract venture capital investments to Hawaii. The inaugural program focused on software startups and received more than 300 applications. It successfully accepted and graduated 15 companies from its program in its first year. To date, these companies have raised over \$4 million of follow-on investment from private investors. The second program focuses on transmedia content startups and accepted its first cohort in May 2014.

The HI Growth Initiative supported accelerators work closely with the Energy Excelsior, a federally funded, Hawaii based venture accelerator program supporting entrepreneurs with innovative solutions for Hawaii's energy sector challenges.

The HI Growth Initiative co-invested with private investors to create access to startup capital via a fund of funds investment program designed to catalyze investment in Hawaii startups. This effort established Hawaii based venture funds covering the continuum of startup financing needs:

- **Two pre-seed investment funds with angel investors to invest in Hawaii-based venture accelerator portfolio companies**
- **A \$6 million research commercialization fund in partnership with the University of Hawaii Foundation**
- **A \$10 million seed stage fund in partnership with private investors**
- **A \$17 million Series A fund in partnership with institutional investors**

The HI Growth Initiative supports events, like investor summits, Startup Weekends and pitch events that build network density and inspire and prepare entrepreneurs to launch startups. HI Growth's collaborative programs resulted in Hawaii's entrepreneurial community launching "Startup Paradise" as the brand or shared identity for Hawaii's innovation ecosystem.



JUMPSmart Maui is a collaborative clean energy test bed project between Japan and Hawaii that incorporates smart grid, renewable energy, and electric vehicle technologies on Maui with the goal of increasing renewable penetration, improving utility operations, and enabling customers to better manage their energy usage and make smarter energy

choices. Funded through a \$30 million investment by Japan's largest public research and development management organization, New Energy and Industrial Technology Development Organization (NEDO), the project has the potential to create new technology and business models for grids of the future that can be applied to other island states and power grids around the world. This project reaffirms Hawaii's status as one of the leading energy test beds in the Asia Pacific.

Key partners include NEDO, DBEDT, Maui County, Hitachi Ltd., Maui Electric Company, Hawaiian Electric Company, Maui Economic Development Board, Hawaii Natural Energy Institute, University of Hawaii Maui College, the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Advanced Energy Company USA and HNU Energy.

As part of the project, five, level three fast chargers have been in operation on Maui to support project volunteers. Installation of equipment, such as batteries, micro DMSs, and section switches, is continuing for Maui Electric and volunteer homes, with preliminary data gathering already taking place. The next phase, the Great Maui Project, will be a scale up of the JUMPSmart Maui demonstration, with the installation of smart PCS systems and 15 additional fast chargers to demonstrate the concept of virtual power plants, in which distributed renewable energy resources are aggregated for utility use, and vehicle to grid and battery to grid capabilities are used as part of those distributed energy resources. Phase 2 is expected to begin in April 2015.

For more information on the project, please visit JumpSmart Maui's website at [jumpsmartmaui.com](http://jumpsmartmaui.com).



One of the pillars of HSEO's clean energy strategy is leveraging Hawaii's position as a test bed to launch an energy innovation cluster.

As our energy policy states, "Hawaii should not only demonstrate the future of clean energy, but should also help invent it... Innovation is the cornerstone of our economic diversification strategy."

Much of this innovation work is conducted through our partner, the Energy Excelerator (EEx), a startup program that helps companies commercialize new energy technologies and build scalable businesses – starting in Hawaii. In 2014, EEx had a successful year connecting portfolio companies with customers, investors, and funding to accelerate time to market. As of 2013, EEx companies raised \$55M in private capital and generated \$5.6M in revenue. Following are highlights:

- **Ibis Networks is piloting its technology, and a hardware + software platform that monitors and controls energy used in sockets in hotels, schools, and government buildings. One installation at Windward Community College will save that campus an estimated \$260,000 on its energy bill.**
- **Stem, Inc., uses data, analytics and distributed energy storage to reduce peak demand charges and provide services to the electric grid, enabling the integration of more renewable energy. Stem closed a \$15M Series B investment in December 2013 with investors such as GE Ventures and Iberdrola.**

These companies, along with the other 12 companies funded in 2014, gave presentations at multiple events this year. In Honolulu, EEx hosted Startup Paradise Demo Day in conjunction with Blue Startups, where companies presented to 250 investors and community members. Another highlight was the Energy Excelerator's Interactive at Google's PartnerPlex in Mountain View, CA, where EEx companies pitched to an invite-only group of 50 cleantech investors and corporate strategists. The program is also developing the next generation

of Hawaii entrepreneurs through workforce development efforts; EEx trained five interns and hired ten interns for portfolio companies in 2014. EEx portfolio companies have created 134 jobs.

The Energy Excelerator has received national and international acclaim through coverage from outlets such as Pacific Business News, Clean Technica, GigaOm, and Hawaii News Now (KHNL/KGMB), and has attracted funding and support from Hawaiian Electric Industries, the U.S. Department of Defense, and the U.S. Department of Energy.

"HAWAII SHOULD NOT ONLY DEMONSTRATE **THE FUTURE OF CLEAN ENERGY**, IT SHOULD HELP INVENT IT."

INNOVATION = ECONOMIC DIVERSIFICATION





# ELECTRIC VEHICLES ON THE MOVE

The widespread deployment of electric vehicles (EV) in Hawaii is a key approach toward the reduction of fossil fuel dependency; as additional renewable electricity is added to Hawaii's grids and is used to power EVs. EVs could also be an integral component in achieving a more stable and modern electrical grid.

Already, a growing number Hawaii's drivers have adopted EVs as their mode of transportation. In early 2014, Edmunds.com reported Hawaii is tied with Washington State for first place in terms of EV's as a percentage of market share and total vehicle registrations (1.6 percent) from January through November 2013. Hawaii also leads the nation in the number of EV charging locations per capita based on data provided by the U.S. Department of Energy and Census Bureau.

This chart shows the number of registered plug-in EVs in the four counties, as well as the number of publicly available charging stations statewide.

In August 2014, the number of passenger EVs in the state was 2,821, an increase of 1,038 vehicles (58.2 percent) from the same month last year, and an increase of 106 vehicles (3.9 percent) from July 2014. EVs make up 0.25 percent of all vehicles.

| ELECTRIC VEHICLES AND CHARGING STATIONS IN HAWAII<br>(AS OF AUGUST 2014) |                    |                     |
|--|--------------------|---------------------|
| ISLAND   | ELECTRIC VEHICLES* | CHARGING STATIONS** |
| Oahu   | 2,084              | 257                 |
| Maui   | 512                | 74                  |
| Hawaii Island  | 137                | 46                  |
| Kauai  | 87                 | 32                  |
| <b>Statewide</b>   | <b>2,821</b>       | <b>405</b>          |

\*Registered passenger EVs which include plug in hybrid and neighborhood EVs.

\*\*Charging stations reflect the number of Level 1, Level 2, and Fast Charger ports or charging cords/plugs which can service one EV.



### EV Stations Hawaii Mobile App

In 2013, HSEO launched *EV Stations Hawaii*, a mobile application designed to help drivers locate publicly available EV charging stations statewide. The

app helps EV drivers locate the nearest charging station, giving them the confidence that they can recharge while they're on the road. In 2014, the EV Stations Hawaii mobile app updated its user interface including color-coded icons allowing users to quickly identify free (green) and fee-based (blue) charging. The new user interface also allows users to have more screen space is available with a sliding menu. The free mobile app is available at Google Play and iTunes. A desktop version is also available on [energy.hawaii.gov](http://energy.hawaii.gov).

### Hawaii EV Partnership

Hawaii EV Partnership is a group of key EV stakeholders in Hawaii convened by Blue Planet Foundation and Honolulu Clean Cities. HSEO is committed to helping to advance the deployment of EVs in Hawaii and is an active member of the partnership. The group was formed to advise and assist with the design and implementation of EV programs.

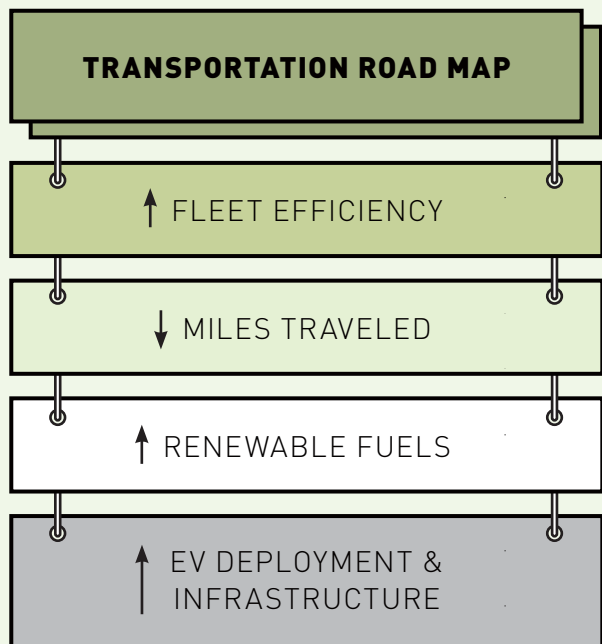
### Transportation Roadmap Re-Evaluation

Transportation accounts for more than 60 percent of the energy consumed in Hawaii, and while air transportation uses the largest portion — nearly 40 percent — trucks, buses, and cars consume roughly 20 percent. The current HCEI overall goal for the transportation sector is to reduce the consumption of petroleum in ground transportation by 70 percent, or approximately 385 million gallons per year, by 2030.

The current roadmap would implement the following strategies:

- Improving standard vehicle efficiency of fleet
- Reducing vehicle miles traveled (VMT)
- Incorporating renewable fuels into the transportation sector
- Accelerating the deployment of electric vehicles and related infrastructure

HCEI 2.0 involves the development and a renewed commitment to a new set of transportation goals and timeline. HSEO is conducting an HCEI transportation charrette, which will be a collaborative quantitative and qualitative planning effort to reduce petroleum based fuels in the transportation sector (ground, marine and aviation). The charrette will engage key energy and transportation stakeholders while assessing and recommending transportation energy industry strategies and tactics.



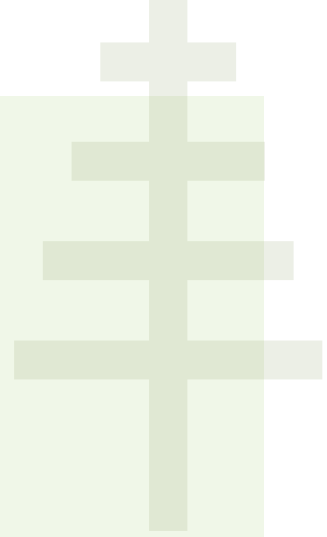


In 2014, **Honolulu Clean Cities** coalition expanded its clean transportation initiatives through a new partnership with local nonprofit, Blue Planet Foundation. The U.S. Department of Energy's

Clean Cities program supports nearly 100 coalitions across the country in their efforts to reduce petroleum use in transportation, targeting fuel use by both vehicle fleets and consumers.

HSEO is a founding partner and active member of the Clean Cities Coalition. Through the partnership, Honolulu Clean Cities and Blue Planet's clean transportation initiatives will focus on fleets, EVs, alternative fuels, clearing the path for more clean multi-modal transportation options such as bicycles and shared transit.

**Bikeshare Hawaii** is a newly formed non-profit organization responsible for overseeing bikeshare across the State of Hawaii. Bikesharing acts as a public transportation system that enables its customers to make short trips between a network of unattended bike docking stations. The nonprofit will work with public and private partners to manage the launch and operations of a bikeshare system in Hawaii. The initial system roll out will focus in urban Honolulu with the vision of expanding the service statewide.



# HAWAII STATE ENERGY OFFICE PROGRAMS & INITIATIVES

With an eye toward economic growth and diversification, HSEO has taken important steps to encourage high-impact, clean energy solutions by implementing successful programs and tools.



**Hawaii Clean Energy Initiative**  
([hawaii-clean-energy-initiative.org](http://hawaii-clean-energy-initiative.org))

In January 2008, a Memorandum of Understanding between the U.S. Department of Energy (DOE) and the State of Hawaii established the Hawaii Clean Energy Initiative, creating a groundbreaking partnership between the state, DOE and public and private sectors. On September 15, 2014 Hawaii and the U.S. Department of Energy reaffirmed its commitment to the clean energy initiative when Gov. Neil Abercrombie and Energy Secretary Ernest Moniz signed a Memorandum of Understanding to increase energy efficiencies and maximize the use of Hawaii's abundant renewable energy resources.

**Developer & Investor Center**  
([energy.hawaii.gov/developer-investor](http://energy.hawaii.gov/developer-investor))

The Developer & Investor Center provides resources for starting a clean energy venture in Hawaii:

- Project Permitting Assistance and Resources
- Financing and Incentives
- Business Registration Resources

**Renewable Energy Permitting Wizard**  
([wizard.hawaii-clean-energy-initiative.org](http://wizard.hawaii-clean-energy-initiative.org))

This tool helps developers proposing renewable energy projects in Hawaii with county, state, and federal permits.

**Renewable EnerGIS Map**  
([energy.hawaii.gov/resources/renewable-energis-map](http://energy.hawaii.gov/resources/renewable-energis-map))

This online mapping tool provides renewable

energy resource and site information for specific Hawaii locations. It helps landowners, developers, and policy makers assess the renewable energy potential of sites statewide.

**Hawaii Renewable Energy Projects Directory**  
([energy.ehawaii.gov/epd/public/energy-projects-map.html](http://energy.ehawaii.gov/epd/public/energy-projects-map.html))

This interactive online directory provides information on renewable energy projects in Hawaii, both operational and those in development.

**Hawaii's Clean Energy Leaders**  
([energy.ehawaii.gov/epd/public/re-projects-home.html](http://energy.ehawaii.gov/epd/public/re-projects-home.html))

The renewable energy projects listed in this interactive online directory are demonstrating progress in becoming commercial enterprises with the potential of contributing to the state's clean energy goals.



**EV Stations Hawaii Mobile / Web App**  
([energy.hawaii.gov/testbeds-initiatives/ev-ready-program/ev-stations-hawaii-mobile-app](http://energy.hawaii.gov/testbeds-initiatives/ev-ready-program/ev-stations-hawaii-mobile-app))

This mobile application is designed to help drivers locate publicly available electric vehicle (EV) charging stations statewide. The app helps EV drivers locate the nearest charging station giving them the confidence that they can recharge while they're on the road.

**GEMS**  
([energy.hawaii.gov/testbeds-initiatives/gems](http://energy.hawaii.gov/testbeds-initiatives/gems))

GEMS, or Green Energy Market Securitization, is an innovative financing model designed to make clean energy improvements, such as photovoltaic panels, affordable and accessible to underserved community members, including low- and moderate-income homeowners, renters and nonprofits. GEMS will take a proven rate-reduction bond structure



to provide low-cost financing to utility customers. Payment for the devices would be made over time through one's electricity bill and paid for with the energy savings.



**GreenSun Hawaii**  
([energy.hawaii.gov/energy-efficiency/energy-efficiency-financing](http://energy.hawaii.gov/energy-efficiency/energy-efficiency-financing))

GreenSun Hawaii makes energy improvements for homes, multi-family projects, nonprofit organizations and businesses affordable by partnering with local banks and credit unions. The program provides participating lenders access to a loan loss reserve designed to absorb first losses on loans made to finance eligible energy efficiency and renewable energy system installations.



**Hawaii Green Business Program**  
([energy.hawaii.gov/green-business-program](http://energy.hawaii.gov/green-business-program))

The Hawaii Green Business Program assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. A partnership between Hawaii's Department of Health; Department of Business, Economic Development, and Tourism; and the Chamber of Commerce of Hawaii, this program highlights businesses that are dedicated to creating a sustainable Hawaii.

**Hawaii Energy Facts & Figures (Bi-Annual Report)**  
([energy.hawaii.gov/resources/hawaii-state-energy-office-publications](http://energy.hawaii.gov/resources/hawaii-state-energy-office-publications))

This semi-annual report is a comprehensive collection of data on Hawaii's energy landscape include electric utilities, renewable energy and energy efficiency.



**Asia Pacific Clean Energy Summit & Expo**

Provides a forum for the high-level global networking necessary to advance this emerging clean energy culture. The summit features informative panel discussions, interactive expositions and networking opportunities for clean energy stakeholders, developers, investors, policy makers and community members from Hawaii, the U.S. mainland and around the Asia Pacific region.





## HAWAII STATE ENERGY OFFICE FUNDING SOURCES

HSEO is supported primarily by its Energy Security Special Fund (ESSF), established under section 201-12.8, HRS. The ESSF receives 15 cents of the Environmental Response, Energy, and Food Security Tax on each barrel of petroleum product sold by a distributor to any retail dealer or end user of petroleum product, other than a refiner. Act 107, SLH 2014 extended the allocation of revenues collected from the tax to the ESSF, from June 30, 2015, to June 30, 2030. Since fiscal year 2011, the ESSF revenues have been approximately \$3.9M per fiscal year.

Federal funding from the U.S. Department of Energy (USDOE) and other federal agencies supplements HSEO's ESSF funding. Following the expiration of American Recovery and Reinvestment Act (ARRA) funding, HSEO pursues other federal funding opportunities. The USDOE's State Energy Program provides an annual formula allocation of approximately \$280K.

In fiscal year 2014, HSEO, in partnership with the High Technology Development Corporation (HTDC), entered into an agreement with the Research Corporation of the University of Hawaii, for the benefit of the Hawaii Natural Energy Institute's Hawaii Energy Sustainability Program and the Energy Systems Development Fund. Under the agreement, \$1.195M will support energy priority projects. The projects will contribute to Hawaii's most important economic enterprise, developing a clean energy economy for Hawaii. Together, HTDC and HSEO will provide a catalyst that enables the development of clean energy business, projects and growth of new jobs for Hawaii.

As HSEO looks toward the next fiscal biennium (FB 15-17), an increased allocation of the Environmental Response, Energy, and Food Security Tax will be proposed for the ESSF. HCEI 2.0's aggressive goals and roadmap to exceed 70 percent clean energy by 2030 demand this commitment of funding and support.

| HAWAII STATE ENERGY OFFICE BUDGET |                                 |                  |             |                                 |                  |             |
|-----------------------------------|---------------------------------|------------------|-------------|---------------------------------|------------------|-------------|
|                                   | FY2014<br>ACTUAL                |                  |             | FY2015<br>BUDGETED              |                  |             |
|                                   | ENERGY SECURITY<br>SPECIAL FUND | FEDERAL<br>FUNDS | TOTAL       | ENERGY SECURITY<br>SPECIAL FUND | FEDERAL<br>FUNDS | TOTAL       |
| Personal Services                 | \$3,189,601                     | \$152,104        | \$3,341,705 | \$3,649,525                     | \$-              | \$3,649,525 |
| Other Current Expenses            | \$1,414,455                     | \$1,318,702      | \$2,733,157 | \$2,239,780                     | \$3,584,192      | \$5,823,972 |





## REVENUE AND EXPENSES CHART

| SOURCE   | REVENUES           | EXPENDITURES       |   |
|--|--------------------|--------------------|---|
|  |                    | PERSONNEL          | OPERATING EXPENSES<br>(E.G., TRAVEL, EQUIPMENT,<br>SUPPLIES, CONTRACTS) |
| Energy Security Special Fund *   | \$3,770,222        | \$3,189,601        | \$1,414,455   |
| USDOE<br>State Energy Program Formula Grant                                | \$114,627          | \$-                | \$107,989   |
| USDOE<br>State Energy Program Recovery Act Grant                           | \$726,261          | \$-                | \$726,261   |
| USDOE<br>Energy Efficiency Recovery Act Grant                              | \$129,525          | \$87,293           | \$42,986  |
| USDOE<br>HI Renewable Energy Grid Project Grant                            | \$264,810          | \$64,811           | \$200,000   |
| USDOE<br>Hydrogen Power Park Grant   | \$26,809           | \$-                | \$-   |
| USDOE<br>Hawaii's Clean Energy Transformation<br>and Grid Connection Grant | \$224,942          | \$-                | \$224,942   |
| USDOE<br>Advancing Energy Efficiency in Hawaii Public<br>Buildings Grant   | \$1,415            | \$-                | \$1,415   |
| USDOE<br>Clean Cities Grant  | \$2,166            | \$-                | \$2,166   |
| USEPA<br>Hawaii Going Green Intern Development                             | \$12,943           | \$-                | \$12,943  |
| PVE - Stripper Well Funds  | \$41               | \$-                | \$-   |
| PVE - Exxon Funds  | \$83               | \$-                | \$-   |
| PVE - Chevron Funds  | \$548              | \$-                | \$-   |
| Energy Audits<br>Recipients' Share of Cost                                 | \$3,500            | \$-                | \$-   |
| <b>TOTAL</b>   | <b>\$5,277,890</b> | <b>\$3,341,705</b> | <b>\$2,733,157</b>  |

\* ESSF revenue from Environmental Response, Energy, and Food Security Tax: \$3,719,218.13

## HAWAII STATE ENERGY OFFICE FUNDING SOURCES

| HAWAII STATE ENERGY OFFICE - FEDERAL GRANTS |  |                 |  |   |
|---|--|-----------------|--|---|
| FUNDING AGENCY                              | AWARD TITLE  | AWARD AMOUNT    | GRANT OBJECTIVE  | PARTNERS  |
| USDOE - NETL                                | Hawaii Renewable Energy Grid Project                                       | \$500,000.00    | To establish a regulatory and policy framework that will enable and accelerate the integration of utility scale renewable energy. Using innovative demand side management, storage, smart grid, plus transmission and delivery technologies for the grid infrastructure of Hawaii.<br>Term: Oct 2008 - Mar 2014.   | University of Hawaii Natural Energy Institute   |
| USDOE - NETL                                | Recovery Act: State Energy Program for State of Hawaii                     | \$25,930,000.00 | To design and carry out the Hawaii State Energy Office's energy efficiency and renewable energy programs, including administration, community outreach, high performance buildings, loan loss reserve program, renewable energy, and transportation energy transformation.<br>Term: Apr 2009 - Mar 2014.   | Various   |
| USDOE - EERE                                | Recovery Act: State of Hawaii Energy Efficiency & Conservation Block Grant | \$9,593,500.00  | To implement the Hawaii State Energy Office's Energy Efficiency & Conservation Strategy in order to reduce fossil fuel emissions; reduce total energy use of the eligible entities; and improve energy efficiency in the building sector, the transportation sector, and other appropriate sectors, along with creating jobs.<br>Term: Sep 2009 - Nov 2014.                  | Various   |
| USDOE - EERE                                | Hawaii's Clean Energy Transformation and Grid Connection                   | \$705,000.00    | To reduce market barriers and costs of greater renewable energy penetration under HCEI by providing technical assistance on regulatory, financial, and utility solutions, particularly focused on adoption of a variety of grid reliability and interconnection standards and by developing streamlined permitting processes and online tools.<br>Term: Sep 2011 - Dec 2014. | Duncan, Weinberg, Genzer & Pembroke<br>Hawaii Information Consortium<br>Hawaiian Electric Company |
| USDOE - EERE                                | State Energy Program Special Projects - Hydrogen Power Park                | \$1,650,000.00  | To conduct engineering and economic validation of pre-commercial hydrogen technologies.<br>Term: Oct 2002 - Dec 2014.  | University of Hawaii Natural Energy Institute   |



## HAWAII STATE ENERGY OFFICE - FEDERAL GRANTS

| FUNDING AGENCY           | AWARD TITLE   | AWARD AMOUNT   | GRANT OBJECTIVE  | PARTNERS  |
|--------------------------|---|----------------|--|---|
| USDOE - EERE             | State Energy Program (SEP) Formula (2010, 2011, 2012, 2013, 2014)                                     | \$1,212,899.00 | To design and carry out the Hawaii State Energy Office's energy efficiency and renewable energy programs.<br>Term: Jul 2010 - Jun 2015.  | Various   |
| USDA - Rural Development | Hawaii Energy Audit Program for Eligible Rural Small Businesses and Farmers in Oahu, Maui, and Hawaii | \$100,000.00   | To prepare Investment Grade Energy Audits (IGA) for rural small businesses and farmers.<br>Term: Feb 2012 - Feb 2015.  | GDS Associates<br>Hawaii Energy<br>County of Maui<br>County of Hawaii   |
| USDOE - EERE             | Advancing Energy Efficiency in Hawaii Public Facilities   | \$350,000.00   | To strengthen , enhance, and expand the State's existing energy efficiency program by Using Energy Star Portfolio Manager (PM) to benchmark appropriate State Executive Branch facilities and use the results to encourage state agencies to bundle facilities to pursue energy efficiency through energy savings performance contracts or other financing mechanisms.<br>Term: Sep 2012 - Sep 2015. | Hawaii Public Benefits Fee Administrator (SAIC/RW Beck)<br>Hawaii Dept. of Accounting & General Services - Public Works Division<br>Hawaii Energy                         |
| USEPA                    | Hawaii Growing Green Intern Development and Pollution Prevention Project                              | \$50,000.00    | To establish an intern program that leverages the support and expertise of partners across the state with the purpose of expanding the Hawaii Green Business Program and Lead By Example Resource Efficiency Checklist Program, which focus on waste reduction, pollution prevention, and resource conservation.<br>Term: Oct 2013 - Sep 2015.   | Hawaii Dept. of Health City and County of Honolulu - Honolulu Board of Water Supply<br>City and County of Honolulu - Refuse Division<br>The Chamber of Commerce of Hawaii |

## FINAL MESSAGE

Driven by HCEI 2.0's goals, Hawaii's clean energy transformation gained momentum in 2014, putting the state squarely in the forefront nationally in terms of renewable energy installations and energy efficiency measures. As outlined in this edition of the Energy Resources Coordinator's Annual report, we are now ahead of our 2015 clean energy interim targets.

A key role of the State Energy Administrator is to shepherd the state's energy policies and high impact deployment strategies among an ever-widening group of stakeholders who are committed to move us closer toward achieving our clean energy goals. Our progress is transcending the statistical evidence of greater renewable penetration and efficiency gains ahead of statutory targets. In the power sector, there is encouraging progress in laying the groundwork for remaking our electrical grids that builds unprecedented levels of consumer choice and services, while preserving resiliency and reliability. We also welcomed a new group of stakeholders under HCEI 2.0 who are helping the state remake its clean energy roadmap for transportation which accounts for two-thirds of Hawaii's energy mix.

Innovation is needed to meet the challenges of energy transformation and Hawaii businesses are answering the call in growing numbers. To foster innovation locally, the Hawaii State Energy Office has partnered with PICHTR's Energy Excelerator, the Hawaii Natural Energy Institute, and the Natural Energy Laboratory of Hawaii Authority, all under the umbrella of the state's growth strategy, known as the HI Growth Initiative. The expansion of Hawaii's alliance with Japan in the JUMPSmartMaui Project is another example of the development and demonstration of new strategies and technologies here in Hawaii that are eliciting national attention - in this case using electric vehicles to help balance household electricity use.

It takes an entire community to carry out Hawaii's clean energy transformation, and the Hawaii State Energy Office is excited to be part of this growing team. Together, we shall face the challenges ahead and secure our clean energy future.

Sincerely,



**Mark Glick**  
*State Energy Administrator, Hawaii State Energy Office*





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