UNIVERSITY OF HAWAIʻI SYSTEM
Legislative Testimony

Written Testimony Presented Before the
Senate Committee on Ways and Means
Friday, March 28, 2014 at 9:15 a.m.
by
Richard Rocheleau, Director
Hawaiʻi Natural Energy Institute
School of Ocean and Earth Science and Technology
University of Hawaiʻi at Mānoa

HB 2312 HD2 SD1 – RELATING TO THE ENVIRONMENTAL RESPONSE, ENERGY, AND FOOD SECURITY TAX

Chair Ige, Vice-Chair Kidani, and members of the committee:

My name is Richard Rocheleau, Director of the Hawaiʻi Natural Energy Institute at the University of Hawaiʻi at Mānoa. I support the parts of HB 2312 HD2 SD1 that would re-establish the Energy Systems Development Special Fund (ESDSF) and extend the repeal of barrel tax allocations until 2030.

The ESDSF, which was administered by HNEI, sunset last June, therefore the current 10 cent allocation of the tax on each barrel of petroleum product imported into Hawaiʻi that went to the ESDSF, now goes to the general fund. While most of HNEI's resources come from other sources, primarily federal funding, re-establishing the ESDSF would allow HNEI to continue to support Hawaiʻi specific projects that could not be directly funded by federal dollars. These include testing of emerging technologies for future deployment in Hawaiʻi such as advance battery energy storage and smart grid technology; modeling to understand technical impacts to grid operations as we move toward our HCEI goals, and independent economic analyses to help decision makers make the most informed decision possible.

Approximately $7 million was deposited into the ESDSF between 2010 and 2013, before it sunset. These funds played a crucial role in leveraging federal investment, removing roadblocks in programs critical for the success of HCEI, and contributing to programs that are likely to spur economic development. The ESDSF funds were, and are being used on projects with significant potential to reduce the use of fossil fuels in Hawaiʻi (see attached ESDSF Factsheet). For example:

- GE RPS Study– this ongoing work builds on previous studies to evaluate and assess the technical barriers and costs associated with implementing changes to the electric grid infrastructure that will move us toward compliance with State RPS requirements. While the initial work has addressed the technical impacts

and cost of various renewable energy penetration scenarios, including comparing the value of grid-tied and generation-tied undersea island interconnections with island independent systems; the ongoing work will also consider the impact and cost of alternative fuels (e.g. LNG), advanced grid management technologies (e.g. battery energy storage and demand response), and sensitivities to issues such as technology cost and changes in demand . The goal of this study is to conduct the work with fully transparent assumptions to inform decision makers as they implement plans to achieve State energy objectives.

- Wave Energy Test Site– although wave energy technology is still precommercial, wave resource studies indicate the potential for significant impact for Hawai‘i. HNEI, via the ESDSF, provided cost-share funding resulting in $4.3 MM additional funding from USDOE for environmental monitoring and independent data analysis to support a grid-connected plug-and-play wave energy generation test facility at Marine Corps Base Hawai‘i. As a result of this effort, HNEI is now finalizing negotiations for an additional $8 million of funding from Navy which will continue these efforts for an additional 2-3 years while also providing direct support to wave energy technology developers to attract them to Hawai‘i. In addition to this federal investment which might not otherwise have occurred, this work will provide Hawai‘i entities with first-hand experience with emerging wave energy technologies.

- Smart Inverters – As the penetration level of photovoltaics increases, advanced technologies to address the impacts of intermittency are critically needed. Under this program, $400K of ESDSF funding was used to leverage $6 million of USDOE funding to develop, demonstrate, and commercialize smart-grid enabled inverters. These advanced inverters will be deployed this quarter on select volunteer homes to validate their ability to help mitigate grid reliability impacts resulting from high penetrations of PV systems. The results of this work will be made available to the utility, to decision makers, and to the technology companies.

- Hawai‘i Clean Energy Programmatic Environmental Impact Statement– The PEIS process is intended to inform federal and local agencies, as well as local communities and developers, about technologies, environmental resource areas, potential impacts, government requirements, best practices, and mitigation measures required to make informed decisions about actions that support achieving HCEI goals, including potential undersea cable island interconnection. Providing a common base of knowledge and understanding for future project-specific environmental reviews to agencies, community members, and developers is intended to facilitate discussion and decision making.

Re-establishing the ESDSF and extending the barrel tax allocation sunset to 2030 will provide a consistent funding source and a clear signal to federal funding agencies that Hawai‘i is committed to advancing its energy policy initiatives and developing efficient and economic technologies that will help ensure Hawai‘i continues to move forward to meet its clean energy goals.

HNEI
Hawai'i Natural Energy Institute
School of Ocean and Earth Science and Technology
University of Hawai'i at Mānoa

ENERGY SYSTEMS DEVELOPMENT SPECIAL FUND

- Established in 2007 under ACT 273. sunset on June 30, 2013
- Purpose: To develop "an integrated approach and portfolio management of renewable energy and energy efficient technology projects that will reduce Hawaii's dependence on fossil fuel and imported oil and other imported energy resources and move Hawaii toward energy self-sufficiency." (HRS §304A-2169(a))
- Unfunded until 2010, when ACT 73 provided 10 cents of the tax on each barrel of petroleum product ("Barrel Tax") be deposited into the fund
- $7 million – approximate funds received before sunset
- HNEI coordinated closely with DBEDT to develop expenditure plans to maximize value of the funds to meet near term needs and opportunities within the state that cannot be met by federal funding alone
- Current portfolio includes renewable power generation, advanced transportation, energy efficient end-use technologies, and the integration of systems to allow increased renewable use

KEY ACTIVITIES/RESULTS

- Supported Hawaii specific projects important for achieving RPS goals
- Leveraged over $12M in federal funds that would not otherwise have been spent on Hawaii research projects

- GE RPS Study ($850K) :
  - Identifies and evaluates scenarios and reserve requirements for achieving 35% to 50% renewables on Oahu and Maui County
  - Compares cost of electricity for various grid-tie, gen-tie, and independent island system scenarios.
  - Ongoing work will assess the impacts of LNG for power production, modified utility operating practices, and advanced ancillary services such as demand response and battery energy storage

- Smart Inverters ($400K) – leveraged $ 6MM USDOE funding to develop, demonstrate and commercialize smart grid-enabled PV inverters to mitigate grid reliability impacts of high penetrations of PV systems

- Wave Energy Test Site ($500K) – Provided required cost-share for wave energy test resulting in $ 4.3 MM additional funding from USDOE and leveraging over $20 MM of current and future investment by USDOD to develop and operate grid-connected plug-and-play facility an MCBH

- Hawaii Clean Energy PEIS ($1.7M)
    - Develops knowledge base for developers, government agencies, and communities about technologies, environmental resource areas, potential impacts, government requirements, best practices, and mitigation measures
    - Provides guidance to streamline project specific NEPA review, permitting processes, and community interaction
    - Draft PEIS due out in March 2014, with public hearings to follow

- Geothermal
    - Resource assessment ($400K) – leveraged over $ 1MM from USDOE to validate a new procedure to map the subsurface structure of the geothermal resource and lower exploration costs
    - Strategic Development study ($115K) – identified needs to prepare state and county agencies for the complex planning, assessment, regulatory, and permitting activities required for geothermal development

- Hydrogen
    - Grid Management ($500K) – leveraged over $1.7MM USDOE and $ 1MM ONR to demonstrate cost effective use of electrolyzer to simultaneously produce hydrogen for fuel and provide for ancillary services to grid
    - Fueling ($550K) - supported the development of critical hydrogen delivery infrastructure to deliver hydrogen produced at the PGV geothermal plant to Hawaii Volcanoes National Park to support fuel cell electric shuttle buses

- Hawaii Energy Policy Forum support/HCEI metrics ($350K) – general forum support and development of metrics to measure the State's progress toward meeting the Hawaii Clean Energy Initiative's requirements

- Pacific Asian Center for Entrepreneurship and E-Business (PACE) ($50K) – funded several UH College of Business fellowships to conduct technical and business analyses of critical energy issues

- Sea Water Air Conditioning ($160K) – monitoring of SWAC projects to validate high-fidelity plume models that assess the impacts of cold water return depth. Depth of discharge has major impact on the overall cost of the SWAC project.

- Energy Efficiency ($356K) – research and demonstration projects on lower cost natural ventilation and cooling systems including radiant cooling and ceiling fan control systems supporting HCEI energy efficiency goals

- Hawaii State Energy Office support ($1M) – support programs for energy efficiency, renewable energy, and test bed development, education and outreach