NATURAL ENERGY LABORATORY OF HAWAII AUTHORITY

An Authority of the State of Hawaii attached to the Department of Business, Economic Development & Tourism

Statement of
Gregory P. Barbour
Executive Director
Natural Energy Laboratory of Hawaii Authority
before the

COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION
and
COMMITTEE ON ECONOMIC DEVELOPMENT & BUSINESS

Tuesday, February 14, 2017
11:01 am
State Capitol, Conference Room 325

in consideration of

HB 1248
RELATING TO MICROGRIDS.

The Natural Energy Laboratory of Hawaii Authority (NELHA) strongly supports HB 1248 which enables microgrid demonstration projects in Hawaii.

Experts in renewable energy believe that microgrids are essential to the modernization of America's power delivery system as the electric power grid evolves from a passive to an active grid. As the State of Hawaii continues its efforts towards a 100% clean energy goal, it becomes increasingly important and urgent to implement microgrids which can integrate renewable energy sources, energy storage, demand response and distributed energy.

The implementation of microgrid technology at NELHA has long been a key component of NELHA's Distributed Energy Resources (DER) strategy and its master plan which were recently updated in 2013 and 2011 respectively.

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Phone: (808) 327-9585 Fax: (808) 327-9586 Email: nelha@nelha.org Website: nelha.hawaii.gov

We are an ideal location to address deployment challenges, understand integration into the island-wide utility grid and perhaps most importantly how microgrids can help the island-wide grid. NELHA possesses a unique combination of physical infrastructure and access to clean energy resources. More specifically, NELHA's strategic location on Keahole Point results in our technology park being a self-contained "branch" served by a two separate feeder lines from the main island-wide transmission grid. In addition, as a seawater utility, we operate three main pump stations throughout the park with a high electrical demand of approximately 1 MW. Finally, we have many existing and planned renewable energy demonstration projects ranging from energy generation (ocean thermal energy conversion, concentrated solar power, PV, and biofuels) to energy storage (electrical energy storage test bed, and hydrogen production and storage). Given these characteristics, it is important to note that we have seen considerable interest from the National Labs in locating future projects at NELHA to observe real world demonstrations of innovative energy technologies.

HB 1248 would facilitate and accelerate the implementation of microgrid technology at NELHA by assisting us in applying for US Federal government funding. We have also had many inquiries from businesses and governments overseas interested to microgrid demonstration at NELHA due the unique characteristics outlined above. In addition, while NELHA has assembled various microgrid components, HB 1248 would allow NELHA to adopt a more comprehensive approach with respect to its DER by removing current limitations. Our vision is to deploy microgrid technology only within the park to serve our own demand from the seawater pump stations and the park clients' needs. We do not intend to wheel electrical power outside of the park boundaries.

The lessons learned here at NELHA will be directly applicable to the rest of Hawaii to help in understanding the benefits of microgrids to island wide grids. It will also help fulfill NELHA's mission of economic development in West Hawaii by stabilizing electrical costs within the park, assisting with the commercialization of renewable energy technologies and diversifying the economy.

Thank you for the opportunity to offer these comments.

TESTIMONY OF RANDY IWASE
CHAIR, PUBLIC UTILITIES COMMISSION
STATE OF HAWAII
TO THE
HOUSE COMMITTEES ON
ENERGY AND ENVIRONMENTAL PROTECTION
&
ECONOMIC DEVELOPMENT AND BUSINESS

February 14, 2017
11:01 a.m.

MEASURE: H.B. No. 1248
TITLE: RELATING TO MICROGRIDS

Chair Lee, Chair Nakashima, and Members of the Committee:

DESCRIPTION:

This measure would exempt "microgrid demonstration projects" from Public Utilities Commission ("Commission") regulation, except as may be needed to facilitate safe interconnection of the to an electric public utility grid.

This measure designates the property controlled by the Natural Energy Laboratory of Hawaii Authority and the Kalaeloa Community Development District as "microgrid demonstration projects." This measure also authorizes the Commission to designate other demonstration projects after an unspecified date. This measure also authorizes the Commission to enable and compel electric utilities to allow the development of microgrid demonstration projects.

POSITION:

The Commission offers the following comments for the Committee's consideration.

COMMENTS:

The Commission supports the development of microgrids as an option to meet the energy needs of customers as articulated in the *Commission's Inclinations on the Future of Hawaii's Electric Utilities* (See Docket No. 2012-0036, Order No. 32052).

However, the Commission notes that oversight and consumer protection issues may arise for entities served or affected by microgrids exempt from Commission regulation. For example, it is unclear how just and reasonable rates and important minimum standards for reliability would be established for microgrids exempt from Commission regulation, particularly if that microgrid "may or may not use portions of an electric public utility's transmission or distribution lines" and "may or may not provide, sell, or transmit renewable energy to a person other than the person who owns, controls, operates, or manages the microgrid[.]" Furthermore, it is unclear if the proposed language related to wheeling could result in undue subsidization of microgrids by other customers, absent Commission review.

Thank you for the opportunity to testify on this measure.

energy
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TESTIMONY OF JOHN CROUCH ON BEHALF OF ERS, A RENEWABLE ENERGY COMPANY BASED IN HAWAII, BEFORE THE
HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION

In SUPPORT of HB 1248 RELATING TO MICROGRIDS

Tuesday, February 14, 2017 11:01 am. Conference Room 325

Aloha, Rep. Chris Lee, Chair: Rep. Nicole E Lowen, Vice Chair and members of the Committee, my name is John Crouch. I have been involved in the design and installation of renewable energy projects in Hawaii since the first large unit at Mauna Lani Bay Hotel and Bungalows in 1998 and the first large scale PV project in Hawaii, 2008, on Lana'i composed of 1.5MW of PV to supply 30% of the daytime load.

ERS is in **SUPPORT** of **HB 1248.**

This Bill gives the opportunity to demonstrate the use of microgrids without the cumbersome filings of a utility entity. This is needed to facilitate the use of microgrids in our schools and other qualified entities.

Microgrids can facilitate the achievement of Hawaii's clean energy policies by enabling the integration of higher levels of renewable energy and advanced distributed energy resources, including energy storage and demand response to our electrical grid system.

It is important to allow microgrids to operate as NON UTILITY entities, because they serve specific, easily identified, users, not the general public.

HB 1248 – Is important as a tool to help us reach our goals of energy security sooner than later.

Thank you for allowing me to testify.

X

John Crouch
President

LEAGUE OF WOMEN VOTERS®

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COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION
COMMITTEE ON ECONOMIC DEVELOPMENT & BUSINESS
Tuesday, February 14, 11:01 a.m., Conference Room 325

HB1248 RELATING TO MICROGRIDS

TESTIMONY

Nancy Davlantes, Legislative Committee, League of Women Voters of Hawaii

Chairs Lee and Nakashima, Vice-Chairs Lowen and Keohokalole, and Committee Members:

The League of Women Voters of Hawaii supports HB1248, which would authorize the establishment of microgrid demonstration projects for the generation, storage, and distribution of renewable energy.

The League has long supported actions to promote energy conservation and research into alternate energy resources available in Hawaii, taking into consideration environmental effect, economic feasibility, and differing conditions on each island.

A microgrid is a small-scale power grid that can operate independently or in conjunction with the area's main electrical grid. The legislature believes that microgrid demonstration projects will enable the state to learn how to reduce costs, increase grid reliability and resiliency, reduce pollution and greenhouse gas emissions, reduce the cost of infrastructure, and increase the efficiency of transmission and distribution.

As Hawaii works toward its goal of 100% renewable energy, microgrids can play a significant role in achieving it.

Thank you for the opportunity to submit testimony.

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COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION
Rep. Chris Lee, Chair
Rep. Nicole E. Lowen, Vice Chair

COMMITTEE ON ECONOMIC DEVELOPMENT & BUSINESS
Rep. Mark M. Nakashima, Chair
Rep. Jarrett Keohokalole, Vice Chair

DATE: Tuesday, February 14, 2017
TIME: 11:01 am
PLACE: Conference Room 325

HB 1248 RELATING TO MICROGRIDS. **SUPPORT WITH AMENDMENT**

Life of the Land is Hawai`i's own energy, environmental and community action group advocating for the people and `aina for 47 years. Our mission is to preserve and protect the life of the land through sound energy and land use policies and to promote open government through research, education, advocacy and, when necessary, litigation.

HB 1248 "authorizes the establishment of microgrid demonstration projects for the generation, storage, and distribution of renewable energy."

North America (Southern Canada, the lower 48 U.S. States, and Northern Mexico) has three transmission grids. Hawai`i has five.

North America is largely powered by baseload fossil fuel and some baseload hydro. Hawai`i is increasing using intermittent wind and solar.

A small disturbance on the North America grid can be absorbed. A single failure on a Hawai`i island can affect frequency and voltage throughout the island.

Thus, maintaining the reliability of the Hawai`i grids are a uniquely critical job.

The Hawaiian Electric Company transmission and distribution grid on O`ahu is the largest manmade structure in the State.

The Public Utilities Commission does not need to take steps to allow microgrids. The last three Chairs of the Commission, Hawaiian Electric Company, and Life of the Land, have all asserted that microgrid are legal today, and, in fact, already exist in this State. There are military and civilian microgrids in Hawai`i.

This bill is not really about microgrids. Rather, the proposal is that some new microgrids be exempt from regulatory review, exempt from wheeling, may sell power to customers still receiving power from the utility, and may charge whatever rates they deem reasonable.

There are several issues. What happens to the reliability and cost impacts and risks to those customers who are not part of the microgrid? Will utility workers be safe? Will rates go up or down for non-subscribers to the microgrid? These issues are the kuleana of the Public Utilities Commission. This bill proposes to remove those safeguards, and to give authority to those who may not have the tools to understand the risks, to themselves, and to the utility grid.

On December 9, 2016, the Public Utilities Commission issued Order No. 34206 establishing the statement of issues and procedural schedule for phase 2 of its Investigation of Distributed Energy Resource Policies. The Commission has established a two-year (2017-18), two-track (technical and market) effort with emphasis on implementing solutions as they become available. Issues involve new forms of Distributed Energy Resources, including grid-supply, and self-supply, and time-of-use tariff options. Nine issues and ten sub-issues were identified.

The participants in the regulatory proceeding are HECO, MECO, HELCO, KIUC, Consumer Advocate, DBEDT, HSEA, HREA, REACH, Hawaii PV Coalition, (Blue Planet, TASC, Sunpower Corp, Life of the Land, DER of Hawai`i, Puna Pono Alliance, EFCA, Ulupono, and Ron Hooson.

Proposed Amendment

The existing language of the bill be replaced with new language, instructing the Commission modify Order No. 34206, to give added emphasis to microgrids.

Microgrids

10. Identifying what impact, if any, various types of microgrids will have on Hawaii's electric transmission and distribution grid.

11. Identifying what impact, if any, intra governmental wheeling will have on Hawaii's electric grid; a. Identifying the costs to utilities of implementing intra-governmental wheeling; b. Identifying any rate design and cost allocation issues associated with intra-governmental wheeling; c. Considering the financial cost and impact of intra-governmental wheeling on non-wheeling customers of a utility, i.e., an uncompensated use of the utility system; d. Identifying any power back-up issues; and e. Addressing how rates for intra-governmental wheeling would be set.

Mahalo,

Henry Curtis,
Executive Director

Email: communications@ulupono.com

HOUSE COMMITTEES ON ENERGY & ENVIRONMENTAL PROTECTION AND ECONOMIC DEVELOPMENT & BUSINESS
Tuesday, February 14, 2017 — 11:01 a.m. — Room 325

Ulupono Initiative Strongly Supports HB 1248 with an Amendment, Relating to Microgrids

Dear Chair Lee, Vice Chair Lowen, Chair Nakashima, Vice Chair Keohokalole, and Members of the Committees:

My name is Kyle Datta and I am General Partner of the Ulupono Initiative, a Hawai'i-based impact investment firm that strives to improve the quality of life for the people of Hawai'i by working toward solutions that create more locally produced food; increase affordable, clean, renewable energy; and reduce waste. Ulupono believes that self-sufficiency is essential to our future prosperity and will help shape a future where economic progress and mission-focused impact can work hand in hand.

Ulupono strongly supports HB 1248, which authorizes the establishment of microgrid demonstration projects because it aligns with our goal of increasing the production of clean, renewable energy in Hawai'i.

The State has set an ambitious goal of 100 percent clean energy by 2045 and that will take a high amount of renewable energy innovation. Microgrid projects can provide communities and organizations with a faster path for incorporating renewable energy production and storage projects. In addition, it allows the utility, regulators, and stakeholders with test cases for new methods of reducing imported fossil fuel use. Microgrids provide each island system with greater resilience because these grids are able to separate from the electricity grid if it fails and then help restart the grid. While the Department of Defense microgrids help play this role today, additional microgrids on the civilian side would augment system security for all. Certain microgrids with businesses that critically depend on continuous supply of electricity have a special need to sell power to those businesses without being considered a public utility. An example is NELHA in Kailua Kona where the fisheries businesses would suffer catastrophic losses and it is less expensive to provide reliability for the microgrid than the individual business.

It is important to note that microgrids do not necessarily result in customers leaving the grid or "grid defection." Depending on design, micro grids can become a dispatchable

resource to the grid of both renewable energy and ancillary services or a reduction in load (demand response) by "islanding" off the micro grid from the main utility grid. This can provided both added flexibility to the utility grid as well as resilience to those on the micro grid. The legislation should ensure that enabling microgrids does not cause grid defection without the appropriate exit charges to ensure the remaining grid customers are not harmed. This can be addressed with by amending section 269 (b) in the bill to read:

(b) The public utilities commission may take any steps the commission deems necessary to enable and compel electric public utilities to allow the development of microgrid demonstration projects by non-utilities. These steps may include issuing related orders, amending or adopting related rules, working with permitting agencies or other authorities to grant exemptions, or other steps necessary to enable microgrid demonstration projects. The public utilities commission shall determine what exit charges are necessary to prevent the remaining ratepayers from paying for the embedded costs that would otherwise been paid by the microgrid customers.

As Hawai'i's energy issues become more complex and challenging, we appreciate this committee's efforts to look at policies that support renewable energy production.

Thank you for this opportunity to testify.

Respectfully,

Kyle Datta
General Partner

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 13, 2017 11:32 AM
To: EEPtestimony
Cc: leslie@dercouncil.org
Subject: *Submitted testimony for HB1248 on Feb 14, 2017 11:01AM*

HB1248
Submitted on: 2/13/2017
Testimony for EEP/EDB on Feb 14, 2017 11:01AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Leslie Cole-Brooks	DER Council of Hawaii	Support	No

Comments:

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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TESTIMONY BEFORE THE HOUSE COMMITTEES ON ENERGY & ENVIRONMENTAL PROTECTION AND

ECONOMIC DEVELOPMENT & BUSINESS

H.B. No. 1248

Relating to Microgrids

Tuesday, February 14, 2017
11:01 am
State Capitol, Conference Room 325

Kevin M. Katsura
Assistant Deputy General Counsel (Regulatory), Legal Department
Hawaiian Electric Company, Inc.

Chairs Lee and Nakashima and Members of the Committees:

My name is Kevin Katsura and I am testifying on behalf of Hawaiian Electric Company and its subsidiary utilities Maui Electric Company and Hawai‘i Electric Light Company (collectively referred to as the “Companies”). The Companies support microgrids that benefit all customers (those within and outside the microgrid) Accordingly, the Companies oppose H.B. 1248.

This bill, among other things, states that microgrids have the potential to be a testing ground for greater integration of renewable energy. The Companies already have plans to accelerate to 100 percent renewable energy on the islands of Molokai and Lanai, which is in part to provide critical information and operation experience in operating a high / 100 percent renewable energy grid.

This bill, however, does not define what constitutes a demonstration and is not limited to any time period. The bill also proposes to exempt a demo microgrid for requirements of utilities. Because of the wide definition, one could use this bill as written to justify the build out of an electric grid across multiple properties, across public rights of way, serving many customers, but not be subject to the requirements of an electric grid.

This bill, among other things:

- Exempts microgrid demonstration projects from being regulated as a public utility, however it does not define what constitutes a demonstration project and it is not bound by any time period.
- Allows the establishment of microgrids demonstration projects before determining if it is feasible, how it would impact all customers in Hawaii, and whether it would fit into the state's energy policy of 100% RPS cost effectively by 2045.
- May benefit some customers at the expense of all other customers who will have to pay for all the cost of the current infrastructure while impeding the utilities' ability to pursue 100% renewable energy by 2045.
- May result in the degradation of service reliability as the utility would not be able to negotiate to change operating requirements and project design to protect the system. The utilities need to be involved in setting operational reliability standards to assure system reliability.
- Based on the broad definition, could be used to justify the build out of an electric grid across multiple properties, across public rights of ways, servicing many customers, but not be subject to the requirements of an electric grid.

To ensure ALL customers benefit from, and are not adversely impacted by microgrids, we recommend that four key principles be addressed:

1. *Fairness with increased customer options:* Some of our customers have expressed an interest in exploring microgrids as the economics of different solutions, such as renewables and storage, improve. We recommend that the bill encourage collaboration and partnering between utilities and customers to design and operate microgrids and determine and coordinate the specific services needed. These

additional services should enhance the value for customers connected to the integrated energy district and ensure that ALL customers benefit from establishing microgrids, not just those within the microgrids. Also, customers within the microgrids should continue to remain customers of the utility and be able to participate in the utilities' energy programs as part of the broader integrated grid. One example of this concept is the collaboration between Hawaiian Electric and the Army to install a 50MW generating facility at Schofield. This system will normally be connected to the larger gird to provide benefits to all customers, but has the ability to be isolated to the Army system to provide them increased energy security and resiliency during abnormal circumstances, a high priority requirement for the Department of Defense.

2. *Safety when operating the integrated energy district:* Operating an electric grid is complex and the safety of all customers served is paramount. Having an integrated energy district within the macro grid adds more complexity to the coordination and operation of these systems particularly when personnel are working in the energy district and in the macro grid. It is recommended that the operation of the integrated energy district be the responsibility of the Companies to ensure the safety of all customers served.

3. *Reliability of the macro electric system*: There may be operational benefits that could be derived from an integrated energy district if executed in close coordination and partnership with the macro electric system. To ensure that ALL customers benefit, there should not be any compromise to the stability and reliability of the public utility's electric grid.

4. *Fairness regarding cost shift issues:* In addition, microgrids should not result in increased costs for customers outside of the microgrids. The operational and economic benefits of an integrated energy district should benefit ALL customers. To ensure there is no cost shift issues, regulatory policies need to be addressed as well.

In addition, this Bill does not accurately describe microgrids as it could be interpreted as a grid connected to another one. we would like to include the following definition of a microgrid as defined by the USDOE microgrid group:

> *A microgrid is a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.*

Thank you for this opportunity to testify.

COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION
Rep. Chris Lee, Chair
Rep. Nicole E. Lowen, Vice Chair

COMMITTEE ON ECONOMIC DEVELOPMENT & BUSINESS
Rep. Mark M. Nakashima, Chair
Rep. Jarrett Keohokalole, Vice Chair

DATE: Tuesday, February 14, 2017
TIME: 11:00am
PLACE: Room 325

Theodore (Ted) Peck
CEO, Holu Energy
1110 Nuuanu Avenue
Honolulu, HI 96701

RE: HB 1248 RELATING TO MICROGRIDS.

Aloha Chairs Lee and Nakashima, Vice Chairs Lowen and Keohokalole and Members of the Committees

Thank you for the opportunity to provide testimony on this bill. My name is Ted Peck. I am the former Energy Administrator for the State of Hawaii, and have been working in energy development for the last 6 years. I have over a quarter century of experience with energy and technology. My company, Holu Energy, develops commercial, industrial, and utility energy projects in Hawaii.

We support the intent of this bill as a means of fulfillment of the state's energy goal of 100% renewable energy, and for the appropriate economic development of the state.

Peter Asmus, a leading global expert on microgrids and virtual power plants, maintains a global database for microgrids for Navigant Research. As of 4Q 2016, he has identified 1,681 project entries, representing 16,552.8 MW of operating, under development, and proposed microgrid capacity and 126 new projects, with over 54% of those in the United States

Simply put, a microgrid is collocated electrical load and electrical generation, with the ability to dispatch energy from that generation to meet that load. Microgrids can often be islanded (i.e. detached from the larger grid), but do not necessarily have to be, either temporarily or normally.

Renewable energy resources are by nature distributed assets, and enabling the broader deployment of microgrids will better leverage the limited renewable assets for use to drive fossil fuels out of our energy system, while limiting the challenges for the larger grid regarding grid stability.

Per HRS §227D-2, in part, "The purpose of the natural energy laboratory of Hawaii authority shall be to facilitate research, development, and commercialization of natural energy resources and ocean-related research, technology, and industry in Hawaii". While not explicitly delineated in statute, the ability to facilitate research, development, and commercialization of renewable grid technology will be greatly facilitated by NEHLA's ability to develop one or multiple microgrids.

Regarding Kalaeloa, the former Naval Air Station Barbers Point was closed in 1999 in the third round of Base Realignment and Closure after the end of the Cold War. Subsequently, land conveyance and ownership has been divided between the Federal Navy, State agencies, City and County of Honolulu agencies, and private entities. The current distribution grid is past end of life, and tenants in Kalaeloa experience monthly power outages, costly grid electricity, and the lack of reliable infrastructure has been a key cause of the delay in the development and investment of Kalaeloa. Enabling the Kalaeloa Community Development District to be a microgrid will enable a broader range of solutions that puts this tremendous asset to work for the people of Hawaii.

Respectfully,
Theodore A Peck