



# 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

## HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION

Tuesday, February 6, 2018  
8:30 am  
State Capitol, Conference Room 325

in consideration of

### **HB 2460** **RELATING TO MICROGRIDS.**

The Natural Energy Laboratory of Hawaii Authority (NELHA) supports HB 2460 which enables microgrid demonstration projects in Hawaii.

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.

Many reports over the years have recognized that we provide an ideal location to address deployment challenges; provide power to pump seawater to the businesses in the park that require a continuous supply to avoid catastrophic losses; 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 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. NELHA has many components of a microgrid due to its development in the early 80s which includes ownership of switchgear and transformers in the Research Campus and Farm Compound as well as the recent development of Supervisory Control and Data Acquisition System (SCADA) which includes a vast array of utility grade power monitoring devices, computer storage and display system. We also 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).

We put considerable effort into building strategic relationships over the past several years with key players in this field including: Hawaiian Electric and Light Company (HELCO), State Energy Office, UH Natural Energy Institute; the County of Hawaii; National Energy Renewable Laboratory and Sandia National Laboratory. This has led to numerous projects and official MOU with HELCO, County of Hawaii and Sandia National Labs.

HB 2460 would facilitate and accelerate the implementation of microgrid technology at NELHA by assisting us in applying for grant funding. In addition, while NELHA has assembled various microgrid components, HB 2460 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. In addition, it is important to note that a recent national study found that lower costs for electricity increases economic growth. 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. Finally, it is important to note that microgrids can isolate themselves from the larger electricity grid in a time of emergency and thereby add energy resiliency into our communities, thereby increasing public safety and security.

Thank you for the opportunity to offer these comments.

**HB-2460**

Submitted on: 2/5/2018 8:19:00 AM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Melodie Aduja	OCC Legislative Priorities	Support	No

Comments:



Email: [communications@ulupono.com](mailto:communications@ulupono.com)

HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION  
Tuesday, February 6, 2018 — 8:30 a.m. — Room 325

**Ulupono Initiative Strongly Supports HB 2460 with an Amendment, Relating to Microgrids**

Dear Chair Lee, Vice Chair Lowen, and Members of the Committee:

My name is Murray Clay and I am Managing 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 better management of waste and fresh water. 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 2460**, which establishes a Natural Energy Laboratory of Hawai'i Authority (NELHA) microgrid demonstration project, because it aligns with our goal of increasing the production of clean, renewable energy in Hawai'i.

Renewable energy innovation is needed to achieve the state's ambitious goal of 100 percent clean energy by 2045. Microgrid projects can provide communities and organizations with a faster path for incorporating renewable energy production and storage projects. Microgrids provide each island's 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's microgrids help play this role today, additional microgrids on the civilian side would augment system security for all. For businesses that rely upon a continuous supply of electricity from a microgrid, such as hospitals and hotels, certain microgrids need to sell their power to those businesses without being considered a public utility.

NELHA in Kailua-Kona is an excellent example of this, where the fisheries businesses would suffer catastrophic losses in the event of power loss, and it is cheaper to provide reliability for the microgrid than the individual business. NELHA is an important center of aquaculture and energy innovation that has demonstrated that a state authority can be effective and profitable at promoting innovation and commerce. NELHA already demonstrates the state's only operational Ocean Thermal Energy Conversion facility,

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seawater cooling, and an innovative solar gateway center. NELHA will soon be demonstrating grid side storage technology in partnership with HELCO, Sandia Labs, and Ulupono. It is important to NELHA's expansion and for the economic security of the commercial tenants to have continuous power, which will be enabled by a microgrid. For all of these reasons, the provisions in this bill are highly desirable.

The legislation should ensure that enabling microgrids does not cause grid defection without the appropriate exit charges to guarantee the remaining grid customers are not harmed. This can be addressed by amending 269 (d) to read:

(d) "The Public Utilities Commission may take any steps the commission deems necessary to enable and compel electric public utilities to allow the development of the natural energy laboratory of Hawaii authority microgrid demonstration project 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 the development of the natural energy laboratory of Hawaii authority microgrid demonstration project." Starting on page 4, line 19, add, "The Public Utilities Commission shall determine what exit charges are necessary to prevent the remaining ratepayers from paying for the embedded costs that would have otherwise been paid by the microgrid customers."

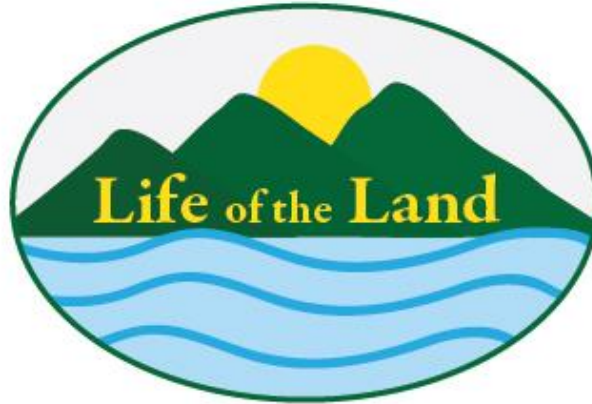
In addition, this legislation provides the utility, regulators, and stakeholders with a test case for microgrids, which may contribute to supporting the state's energy goals.

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,

Murray Clay  
Managing Partner



P.O. Box 37158, Honolulu, Hawai`i 96837-0158  
Phone: 927-0709 henry.lifeoftheland@gmail.com

COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION

Rep. Chris Lee, Chair

Rep. Nicole E. Lowen, Vice Chair

Tuesday, February 6, 2018

8:30 a.m.

Conference Room 325

Re: HB 2460 NELHA Microgrid

**Comments**

**Proposed Amendment:** Natural Energy Laboratory of Hawaii Authority (NELHA) should be treated like Kauai Island Utility Coop (KIUC), i.e., less intense Public Utilities Commission (PUC) oversight.

Aloha Chair Lee, Vice Chair Lowen, and Members of the Committee,

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 2460 asserts that the NELHA microgrid "shall be exempt from the requirements of" state utility law, but at the same time, the public utilities commission shall "authorize" the microgrid.

Microgrids are permitted under Hawai`i laws, rules, and regulations. HB 2460 summarizes existing laws as it pertains to the planned NELHA microgrid.

The bill is needed to change one state policy. “The natural energy laboratory of Hawaii authority microgrid demonstration project shall be exempt from any wheeling restrictions when the wheeling is conducted within the designated boundaries of the project.”

Removing restrictions does not mean avoiding paying rent for leasing the lines.

Wheeling is not defined in state law nor in the bill, but intra-governmental wheeling was defined in by the 2004 Legislature in SCR 180: “the process of transmitting electric power from a seller's point of generation across a third-party-owned transmission and distribution system to the seller's retail customer.”

What isn't clear in the bill is

- (1) whether NELHA must pay HELCO a wheeling charge for use of HELCO electric lines
- (2) whether a NELHA customer can choose to continue to get power from HELCO
- (3) whether and how a customer can switch utility service between NELHA and HELCO
- (4) whether NELHA has the expertise to reliably operate a microgrid
- (5) NELHA and HELCO rates will be compared, by whom, how often, and with what oversight?
- (6) who makes the determination for the above five issues
- (7) NELHA will file a report with the 2019 Legislature. Does the Legislature have greater understanding of microgrids than the PUC?

“Any power that is sold by the natural energy laboratory of Hawaii authority microgrid demonstration project shall be at a price equal to or less than the electric utility rates established by the public utilities commission.”

The PUC sets electric utility rates that vary by (a) customer, (b) tariff, (c) energy cost adjustment clauses, (d) surcharges, (e) time-of-use rates, and (f) payments for demand response. What is being compared?

Mahalo  
Henry Curtis  
Executive Director





**Hawaii Solar Energy Association**  
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**TESTIMONY OF THE HAWAII SOLAR ENERGY ASSOCIATION  
IN REGARD TO HB 2460, RELATING TO RENEWABLE ENERGY,  
MICROGRID DEMONSTRATION PROJECTS  
BEFORE THE  
HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION  
ON  
THURSDAY, FEBRUARY 2, 2017**

Chair Lee, Vice-Chair Lowen, and members of the committee, my name is Will Giese, and I represent the Hawaii Solar Energy Association, Inc. (HSEA)

The HSEA was founded in 1977 to further solar energy and related arts, sciences and technologies with concern for the ecologic, social and economic fabric of the Hawaiian Islands. Our membership includes the vast majority of locally owned and operated solar installers, contractors, distributors, manufacturers, and inspectors across all islands.

The HSEA **supports** HB 2460. This measure seeks to create a microgrid demonstration project through the Natural Energy Laboratory of Hawaii (NELHA) that generates, stores, and distributes renewable energy on NELHA property.

Generally, renewable microgrid are a necessary part of Hawaii's energy infrastructure as the state grows closer to its goal of 100% renewable energy by 2045. A recent study by the Rocky Mountain Institute found that renewable microgrids in island communities reduces costs, build resiliency and grid stability, and contribute to the creation of a smarter grid.<sup>1</sup> An interesting case study of the island nation of Cuba, which ranks second in the world on installed distributed generation after Denmark, found that "microgrids at high-consuming locations could help to avoid transmission and distribution related losses as tourism, demand from private businesses, and strain on the grid grows."<sup>2</sup>

A microgrid, per this bill, is a small scale renewable energy electrical grid that produces, stores, and transmits electricity for use by consumers both on and off the NELHA property. By providing a test case for a resilient renewable microgrid that can provide energy for consumers on and off site, the NELHA demonstration project sets an important benchmark for how microgrids could be constructed throughout the state. Utility dockets regarding distributed generation and community based renewable energy

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<sup>1</sup> Bunker, Kaitlyn. "Renewable Microgrids: Profiles From Islands and Remote Communities Across the Globe." *OurEnergyPolicy.org Renewable Microgrids Profiles From Islands and Remote Communities Across the Globe Comments*, 1 Nov. 2015, [www.ourenergypolicy.org/renewable-microgrids-profiles-from-islands-and-remote-communities-across-the-globe/](http://www.ourenergypolicy.org/renewable-microgrids-profiles-from-islands-and-remote-communities-across-the-globe/).

<sup>2</sup> Panfil, et al. "What's next for Cuba's Electricity Sector?" *The Electricity Journal*, vol. 30, no. 8, 2017, pp. 38-44.



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(CBRE) projects would benefit from a variety of data produced by this facility secondary to its energy producing and transmitting purposes.

An added benefit of legislation regarding microgrid, with HB 2460 in particular, is that they directly address the question of utility wheeling. Wheeling is the transmission of energy from within and electrical grid to an outside electrical load, typically via transmission lines. In many states, wheeling is allowed between utility generators and load receivers in a given service area. Capital costs are recovered through transmission fee mechanisms like transmission access fees. The question of how wheeling will be accomplished by microgrid operators to loads outside of their property lines will eventually need to be answered. The NELHA demonstration project outlined in HB 2460 allows energy consumers, developers, and utility operators the chance to observe and refine different mechanisms by which this might be accomplished within a controlled environment.

Now more than ever renewable microgrids that build resiliency and stability into island electrical grids should be seriously considered as a path to 100% RPS by 2045. In the wake of Hurricane Maria, Puerto Rico released proposed rules on microgrid development to strengthen its grid against extreme weather.<sup>3</sup> As of last month more than 30% of Puerto Ricans are without electricity.<sup>4</sup> Puerto Rico is a wake up call for Hawaii. As a state we must decide if we are going to stand by and wait until a major disaster hits our islands, or be proactive with intelligent and timely energy policy.

We **strongly support** HB 2460 and we urge this committee to pass this measure.

Thank you for the opportunity to testify.

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<sup>3</sup> Staff, PREC. *REGULATION ON MICROGRID DEVELOPMENT*. MI ed., CEPR, ser. 0001, 2018, *REGULATION ON MICROGRID DEVELOPMENT*.

<sup>4</sup> Savransky, Rebecca. "Nearly Half a Million Customers Are Still without Power in Puerto Rico." *TheHill*, 25 Jan. 2018, [thehill.com/blogs/blog-briefing-room/news/370744-nearly-half-a-million-customers-still-dont-have-power-in-puerto](http://thehill.com/blogs/blog-briefing-room/news/370744-nearly-half-a-million-customers-still-dont-have-power-in-puerto).



**Testimony before the House Committee on Energy & Environmental Protection  
February 6, 2018  
8:30 am  
Conference Room 325  
H.B. 2460 – Relating to Microgrids**

**By Keiki-Pua Dancil, Ph.D.  
Director, Business Strategy Development  
Hawaiian Electric Company, Inc.**

Chair Lee, Vice Chair Lowen, and Members of the Committee:

My name is Keiki-Pua Dancil, and I am the Director of Business Strategy Development at Hawaiian Electric Company. I am testifying on behalf of Hawaiian Electric and its subsidiary utilities, Maui Electric and Hawaii Electric Light (collectively “Companies”). The Companies support the intent but **oppose** H.B. 2460.

This measure provides for a microgrid demonstration project at the Natural Energy Laboratory of Hawaii. As we transition to a 100% renewable future, safety, reliability, and resiliency of our island grids is paramount. The Companies believe that properly designed microgrids may provide benefits to all. Currently, there are two bills (S.B. 2933 and H.B. 2110) that encourage and facilitate the development and use of microgrids through the establishment of a standard microgrid services tariff and direct the Public Utilities Commission to open a proceeding by July 1, 2018 to establish a microgrid services tariff. The Companies support S.B. 2933 and H.B. 2110 and believe they provide a better mechanism to accomplish the intent of H.B. 2460.

Thank you for the opportunity to provide this testimony.

**HB-2460**

Submitted on: 2/2/2018 5:57:35 PM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Kat Culina		Support	No

Comments:

**HB-2460**

Submitted on: 2/2/2018 7:32:17 PM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Randy Ching		Support	No

Comments:

Chair Lee, Vice Chair Lowen and members of the committee,

Please pass HB2460. Thank you for the opportunity to testify.

Randy Ching / Honolulu / makikirandy@yahoo.com

**HB-2460**

Submitted on: 2/3/2018 8:39:53 PM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Richard Furst		Support	No

## Comments:

I am writing to urge support for HB2460, relating to microgrid demonstration project at the NELHA facility. I believe that microgrids will play an integral part in our State's move towards 100% renewable energy. It will be essential to provide funds for demonstration projects that can prove the effectiveness of such systems. That is why I am in support of HB2460.

**HB-2460**

Submitted on: 2/3/2018 10:01:08 PM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Sherry Pollack		Support	No

Comments:

**HB-2460**

Submitted on: 2/4/2018 7:56:30 AM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Joan Gannon	West Hawaii CHC	Support	No

Comments:

Yes I Joan Gannon support HB2460



**HB-2460**

Submitted on: 2/4/2018 9:45:54 PM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Jennifer Noelani Ahia		Support	No

Comments:

**HB-2460**

Submitted on: 2/4/2018 10:00:48 PM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Marion McHenry		Support	No

Comments:

**HB-2460**

Submitted on: 2/5/2018 7:45:39 AM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Nathan Yuen		Support	No

Comments:

I support HB 2460 which authorizes the Natural Energy Laboratory of Hawaii Authority (NELHA) to develop a microgrid demonstration project for the generation, storage, and distribution of renewable energy on property controlled by NELHA. We need more projects like this to make renewable energy a more significant part of our economy. I urge you to ass HB 2460 from committee.

**HB-2460**

Submitted on: 2/5/2018 8:50:03 AM

Testimony for EEP on 2/6/2018 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Jennifer Milholen	Kokua Hawaii Foundation	Support	No

Comments: