

TESTIMONY OF RANDY IWASE
CHAIR, PUBLIC UTILITIES COMMISSION
STATE OF HAWAII
TO THE
HOUSE COMMITTEE ON
ENERGY AND ENVIRONMENTAL PROTECTION

February 9, 2016
8:00 a.m.

MEASURE: H.B. No. 1823

TITLE:RELATING TO NET ENERGY METERING

Chair Lee and Members of the Committee:

DESCRIPTION:

This measure increases the generating capacity cap for an eligible customer generator participating in the Net Energy Metering (“NEM”) program from 50 KW to 1MW. This measure also increases the total system capacity limit on NEM to “the aggregate amount of the generating capacity that could be interconnected with the utility’s electric system without substantial expenditure by the utility for new mitigation facilities to maintain reliability of electric service.” Finally, this measure requires that excess energy provided by an eligible customer generator interconnected after June 30, 2016 be valued at “a rate, to be determined for each calendar year by the public utilities commission, that reflects the value of such electricity to the utility, ratepayers, and the public as measured by avoided capacity costs, avoided operating and maintenance costs, avoided fuel costs, and avoided environmental costs.”

POSITION:

The Public Utilities Commission (“Commission”) offers the following comments for the Committee’s consideration.

COMMENTS:

In the Commission’s ongoing investigation into distributed energy resource (“DER”) policies the Commission issued Decision and Order No. 33258 (“Order No. 33258”) in Docket No. 2014-0192 which capped the existing NEM program to address the same issues raised in Section 1 of this measure. When Net Energy Metering was established in Hawaii nearly 20

years ago, it was designed to be a simple, efficient way to encourage customers to become early-adopters of solar PV and other renewable energy technologies.

Over time, the Commission has encouraged participation in the NEM program to increase far beyond the original cap on the NEM program. Today, almost 80,000 customers across the state have installed solar PV, representing nearly 20% of all customers statewide. This level of solar PV adoption is more than 10 times the number of solar PV systems per customer of mainland utilities, and 60 times higher than the initial cap on net metering systems established by the Legislature in 2001. The solar PV industry in Hawaii has grown far beyond the early-adopter stage.

Net Metering has succeeded in supporting rooftop solar as the industry has matured. However, the NEM program was not designed for the scale of adoption experienced today and policies must evolve to meet changing customer and utility system needs. As the Commission observed, “the challenge facing the State today is ensuring that [rooftop PV and other distributed resources] continue to scale in such a way that [they] benefit all customers as each utility transitions to 100% renewable energy.”

Sustained Growth of Solar and Renewable Energy Requires New Policies

Finite Grid Capacity for Daytime Energy

Hawaii’s electric grids can only absorb a finite amount of energy during the middle of the day when solar systems are at their maximum output. To increase the amount of solar energy the grid can handle, the state’s electric utilities are adjusting their operations to bring more renewable energy onto the grid, while still maintaining safe and reliable delivery of electricity to customers. At the same time, owners of solar PV and other renewable energy systems will need to use advanced technologies to help support the grid and deliver energy when it is needed most, not just when the sun is shining or the wind is blowing.

Advanced Technologies Required to Reach Higher Levels of Solar and Renewables

To help support the grid and encourage delivery of energy when it is needed most, customers will increasingly need to use energy storage and demand “flexibility” technologies to better align solar output with customer demand. By providing use of the grid as a free storage device, net metering provides limited incentive for customers to adopt these new technologies. As Hawaii’s energy system evolves, electricity prices must send the right signals to customers about what technologies and services are valuable to the grid, and when they are needed.

Costs of Solar Continue to Decline Significantly

Net Metering requires electric utilities to pay the retail rate for delivered energy, regardless of the cost of solar panels or the value of energy delivered to the grid. This arrangement was simple and necessary when the cost of solar was significantly higher than conventional energy sources. In the years since, the cost of solar panels has plummeted, and recent solicitations for utility-scale solar projects in Hawaii have yielded declining prices for renewable energy (13.5-14.5 cents/kWh on Oahu, 11 cents/kWh on Maui, and 14.5 cents per kWh for a dispatchable solar/storage system on Kauai). Net Metering does not allow the flexibility to adapt compensation rates as the cost of renewables declines and this limitation prevents all customers from sharing in the benefits of lower cost renewable energy.

Evolution to DER 2.0 – Menu of Customer Choices for Distributed Energy Resources

In Order No. 33258, the Commission began an evolution from Net Metering to redesigned, market-based rates for energy delivered to the grid. All existing and pending NEM customers were grandfathered into the NEM program. The Commission ordered the Hawaiian Electric Companies to offer three new options for their customers: Grid Supply, Self-Supply, and a redesigned Time-of-Use rate to encourage daytime energy use. These new options are interim, transitional programs that will 1) allow customers to be fairly compensated for investing in rooftop PV and other renewables, 2) encourage customers to invest in new technologies like energy storage, and 3) ensure that going forward, these systems have the technical capabilities to support the grid during emergencies.

In addition, the Commission has ordered the HECO Companies to offer a re-designed Demand Response program, which will allow customers more options to control their energy use and be compensated for providing essential grid services to the utility.

Thank you for the opportunity to testify on this measure.



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Testimony of ERIK KVAM
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In SUPPORT of HB 1823 RELATING TO NET ENERGY METERING

**Before the
HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION**

Tuesday, February 9, 2016 8:00 a.m.

Aloha, Chair Lee, Vice-Chair Lowen and members of the Committee.

My name is Erik Kvam. I am a Director of Renewable Energy Action Coalition of Hawaii (REACH). REACH is a trade association whose vision is a Hawaiian energy economy based 100% on renewable sources indigenous to Hawaii.

REACH is in **SUPPORT** of HB 1823.

Under NEM, utility customers generate clean renewable energy for their own use and send their excess renewable energy to the grid for use by other utility customers.

The PUC noticed that, under the utility's NEM program, the excess energy sent to the grid was being given an arbitrarily high value. The arbitrarily high value meant that NEM customers were gaining wealth at the expense of non-NEM customers.

The PUC dealt with the transfer of wealth issue by mistakenly setting an arbitrarily low value for the excess energy sent to grid. The PUC's mistake is closing the market for excess renewable energy sent to the grid. The PUC's mistake is putting as many as a thousand people out of work.

What the bill does:

- Corrects the PUC’s mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by valuing excess renewable energy sent to the grid at a rate “that reflects the value of such electricity to the utility, ratepayers and the public as measured by avoided capacity costs, avoided operating and maintenance costs, avoided fuel costs and avoided environmental costs” (the Value of Renewable or “VOR” rate)
- PUC annually determines the Value of Renewable rate
- Increases the NEM system capacity limit from 50 kW to 1 MW
- Increases the NEM aggregate capacity limit from ½ % of peak demand to the aggregate amount of such capacity that could be interconnected with the utility’s electric system without substantial expenditure, as may be determined by the commission, by the utility for new mitigation facilities to maintain reliability of electric service
- Prohibits the utility from assessing interconnection requirements study charges and supplemental review charges against NEM customers

Summary:

The bill corrects the PUC’s mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by requiring that the HECO utilities value excess energy sent to the grid at a rate, determined by the PUC, that reflects the true economic value of such energy to *all* customers and to the general public.

NEM needs to be expanded -- by raising capacity limits and by prohibiting discriminatory charges to NEM customers -- because Hawaii needs all the low-cost, decentralized, grid-connected renewable generation it can get for the day when imported fuels stop flowing to Hawaii.

Thank you for allowing me to testify.

Testimony before the House Committee on Energy & Environmental Protection

H.B. 1823 – Relating to Net Energy Metering

**By Ka’iulani Shinsato
Director, Distributed Energy Resources Programs
Hawaiian Electric Company, Inc.**

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

My name is Ka’iulani Shinsato. I am the Director of the Distributed Energy Resources Programs Division at Hawaiian Electric Company. I am testifying on behalf of Hawaiian Electric Company and its subsidiary utilities, Maui Electric Company and Hawai’i Electric Light Company (Hawaiian Electric Companies).

The Hawaiian Electric Companies oppose House Bill 1823 relating to Net Energy Metering (“NEM”).

House Bill 1823 amends several sections of the NEM Law in Hawai’i Revised Statutes (“HRS”) §§ 269-101 -111. However, the NEM program is now closed. By Decision and Order issued on October 12, 2015, in Docket No. 2014-0192 -- the Public Utilities Commission’s (“PUC”) investigatory proceeding on Distributed Energy Resources (“DER”) -- the PUC closed the NEM program effective the date of the Decision and Order.

The PUC’s Decision and Order was based on a full record, after many months of evaluating technical, economic, and policy issues associated with rooftop solar, in a proceeding involving multiple stakeholders. In its ruling, the PUC acknowledged that NEM has been an extraordinary success in Hawai’i, but also determined, after a comprehensive investigation, that a transition away from NEM is essential to ensure all

customers benefit from continued growth in distributed energy, not just those who have the ability to install solar PV or other forms of DER. This ruling is consistent with the decision of Kauai Island Utility Cooperative to close its NEM program several years ago. One of the primary reasons why the Companies supported closure of NEM in the DER docket was because NEM was resulting in a shift of fixed utility costs from PV customers to non-PV customers.

The Commission approved new rooftop PV programs to replace NEM that will continue to allow customers to add rooftop solar, but in a manner that is fair and sustainable to all customers. Thus, deference should be given to the PUC's Decision and Order, which took the first step in evolving DER programs from the NEM program to two new DER programs after careful review of diverse stakeholder interests in Phase 1 of the DER proceeding.

In addition, the proposed legislation appears to assume that NEM continues in its present form until June 30, 2016. However, in compliance with the Commission's Decision and Order, the Companies have already implemented the two new DER programs, and no longer offer the NEM program to new customers.

Moreover, even assuming the NEM program is re-opened, the proposal to expand the eligible system size under NEM to 1 megawatt under the proposed legislation is unreasonable and contravenes the intent of the NEM statute. As set forth in the NEM statute in Hawai'i Revised Statutes ("HRS") 269-101, NEM was designed to allow a customer to *offset* their load, and was *not* intended to compensate customers for all of their exported generation, such as through a Feed-In Tariff.

Finally, even assuming the NEM program is re-opened, in many respects, the proposed legislation would overlap or potentially conflict with the efforts of the PUC and the parties in Phase 2 of the DER docket. In Phase 1 of the DER docket, the PUC established broad reforms through a collaborative process that will support sustainable growth in the market for rooftop solar PV and other DER desired by Hawai'i's residents

and businesses. The reforms established by the Commission will: (1) promote rapid adoption of the next generation of solar PV and other distributed energy technologies, (2) encourage more competitive pricing of DER systems, (3) lower overall energy supply costs for all customers, and (4) help to manage each island grid's scarce capacity.

In Phase 2 of the DER docket, the PUC will focus on further developing competitive markets for DER in Hawai'i. As stated by the PUC, the PUC will closely monitor the progress of the state's electric utilities as they move towards 100% renewable energy and will take further action to ensure the state's electric utilities continue to reduce costs to customers while ensuring the safety and reliability of each island grid.

More specifically, in Phase 2 of the DER docket, the PUC is expected to rule on the Companies' proposed system and circuit hosting capacity analyses, which pertain to the provision in the proposed legislation that requires DER limits to be set based on "the aggregate amount of the generating capacity that could be interconnected with the utility's electric system without substantial expenditure by the utility for new mitigation facilities to maintain reliability of electric service." Phase 2 is also expected to address another major provision in the proposed legislation -- the value of electricity generated by customers and fed back to the electric grid. The Companies respectfully submit that such determinations are better off left before the appropriate regulatory body, the PUC, where it can build upon the record already developed, and decisions already made, in Phase 1 of the DER proceeding.

For all of these reasons, we ask that this bill be held.

Thank you for the opportunity to testify.



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Testimony of Edmond A Alberton

Founder and COO at Maui Solar Project

e-mail: eddie@mauisolarproject.org

In SUPPORT of HB 1823 RELATING TO NET ENERGY METERING

Before the

HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION

Tuesday, February 9, 2016 8:00 a.m.

Aloha, Chair Lee, Vice-Chair Lowen and members of the Committee.

My name is Emily Erickson. I am the VP of Operations for Maui Solar Project. We install Grid Connected PV on residential homes in Maui.

I am in **SUPPORT** of HB 1823.

Under NEM, utility customers generate clean renewable energy for their own use and send their excess renewable energy to the grid for use by other utility customers.

The PUC noticed that, under the utility's NEM program, the excess energy sent to the grid was being given an arbitrarily high value. The arbitrarily high value meant that NEM customers were gaining wealth at the expense of non-NEM customers.



The PUC dealt with the transfer of wealth issue by mistakenly setting an arbitrarily low value for the excess energy sent to grid. The PUC's mistake is closing the market for excess renewable energy sent to the grid. The PUC's mistake is putting as many as a thousand people out of work.

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The bill corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by requiring that the HECO utilities value excess energy sent to the grid at a rate, determined by the PUC, that reflects the true economic value of such energy to **all** customers and to the general public.

NEM needs to be expanded -- by raising capacity limits and by prohibiting discriminatory charges to NEM customers -- because Hawaii needs all the low-cost, decentralized, grid-connected renewable generation it can get for the day when imported fuels stop flowing to Hawaii.

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Edmond A Alberton





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Testimony of Emily Erickson

VP of Operations at Maui Solar Project

e-mail: emily@mauisolarproject.org

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Emily Erickson





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Testimony of Tony Racanelli

Sales Representative at Maui Solar Project

e-mail: tony@mauisolarproject.org

In SUPPORT of HB 1823 RELATING TO NET ENERGY METERING

Before the

HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION

Tuesday, February 9, 2016 8:00 a.m.

Aloha, Chair Lee, Vice-Chair Lowen and members of the Committee.

My name is Tony Racanelli. I am a Sale Representative at Maui Solar Project. We install Grid Connected PV on residential homes in Maui.

I am in **SUPPORT** of HB 1823.

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Thank you for allowing me to testify.

Tony Racanelli



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In SUPPORT of HB 1823 RELATING TO NET ENERGY METERING

Before the
HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION

Tuesday, February 9, 2016 8:00 a.m.

Aloha, Chair Lee, Vice-Chair Lowen and members of the Committee.

My name is Alan Lennard. I am the Managing director of Green Power Projects LLC and a Director of Renewable Energy Action Coalition of Hawaii (REACH). Green Power Projects LLC is a Solar project facilitation company working towards 100% Renewable Energy capacity in Hawaii. REACH is a trade association whose vision is a Hawaiian energy economy based 100% on renewable sources indigenous to Hawaii.

We are in Full **SUPPORT** of HB HB 1823.

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Alan Lennard - thy signature

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Hawaiian **ENERGY** systems
Solar solutions for your home and business

2/8/16

Ref: Support for HB1823

Aloha

To whom it may concern,

We are pleased to submit a testimony in support of HB1823.

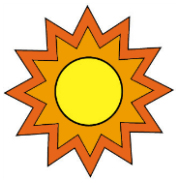
Hawaiian Energy Systems, Inc. is committed to quality PV Solar installation and to ensuring total satisfaction with our products and service. We look forward to helping Hawaii achieve more energy independence. As a local corporation we try to employ local residents and teach/train them to learn a skill which helps them support their families and generates more opportunities in the business community. The solar industry needs dependable stable small companies that achieve the renewable goals and HB1823 is an important step in reducing Hawaii's dependence to imported fuels. Renewable energy generation is necessary for our future. HES, Inc. thanks you in your decision for making a positive environmental impact here in Hawaii.

Malama e Pono

Sincerely,

Darrell Ing
President /COO
Hawaiian Energy Systems Inc.
Phone: 808-927-2169 License # C29898





INTER-ISLAND SOLAR SUPPLY

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73-5569 Kauhola St.	Kailua-Kona, HI	96740	West Hawai'i Island	Tel: (808) 329-7890	Fax: (808) 329-5753
16-206 Wiliama St.	Keaau, HI	96749	East Hawai'i Island	Tel: (808) 935-0948	Fax: (808) 498-4606
400 Ala Makani St. #103	Kahului, HI	96732	Maui	Tel: (808) 871-1030	Fax: (808) 873-7825
1764 Haleukana St.	Lihue, HI	96766	Kauai	Tel: (808) 378-4080	Fax: (808) 378-4078

**TESTIMONY OF THE INTER ISLAND SOLAR SUPPLY
IN REGARD TO HB 1823, RELATING TO NET ENERGY METERING
BEFORE THE
HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION
ON
TUESDAY 9, 2016**

Chair Lee, Vice-Chair Lowen and members of the committee, my name is Richard Reed and I represent Inter Island Solar Supply.

Inter-Island Solar Supply strongly supports HB 1823 with comments. The measure amends §269 101-110 to encourage the development of renewable energy in Hawaii by adjusting the cap on net metering and specifying the way in which energy generated by renewables is valued.

Since the dissolution of NEM in October of 2015 by the Public Utilities Commission of Hawaii, homeowners wishing to install grid connected solar systems on their homes have been given three new options: Customer grid-supply (CGS), customer self-supply (CSS), and time-of use (TOU). The HEI companies release a weekly report on the amount of applications for various grid tie methods for all solar systems submitted for permitting and their respective position on the queue. Since the October NEM decision, the numbers in this report have stagnated. Essentially, not a single CGS or CSS application filed with the HEI companies on any of the participating islands has passed the initial review, much less moved into the technical review. Many of Inter Island's customers have had almost 100% of their CGS applications kicked back to them for revision. The new options for interconnection are unnecessarily cumbersome and expensive.

Furthermore, the new CGS rate model significantly decreases the return on investment of an individual solar system, making the systems more cost prohibitive for consumers. In HECO's October 13th Press Release in response to the PUC decision, they state "The decision is the result of the first phase of the PUC's effort to develop long-term technical and policy solutions that will support the continued growth of rooftop PV in Hawaii." Since October, not a single new application has been approved for installation. Additionally, the length of the previous NEM agreement was around 3 pages, while the new CGS application is 42 pages long and requires a manual to complete.

Additionally, there is concern that the language within sections of this bill is vague and too open to interpretation. Specifically, at page 6 lines 19-20 and page 8 lines 9-10 there is not a clear enough definition on what constitutes a "unreasonable" denial of an application by the utility *or* what constitutes a "substantial expenditure" by the utility. If the utility determines that any new NEM agreements added to the system would equal a "substantial expenditure" than this bill would effectively be dead on arrival. Certain clarifying language should be inserted to determine what these two terms actually mean.

Within HB 1823 at §269-102 on page 5 there is language pertaining to the interconnection of customer energy generators to the utility's electric grid. Special consideration should be given to how the utility and the PUC determine the ability of the electric grid to accept interconnected systems. There should be no reason an applicant is denied a new NEM agreement for oversaturation or grid reliability issues within the confines of this statute. The utility should provide accurate and compelling evidence for denial, with possible review by a third party.

Thank you for the opportunity to testify.



Hawaii Solar Energy Association
Serving Hawaii Since 1977

**TESTIMONY OF THE HAWAII SOLAR ENERGY ASSOCIATION
IN REGARD TO HB 1823, RELATING TO NET ENERGY METERING
BEFORE THE
HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION
ON
TUESDAY FEBRUARY 9, 2016**

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

HSEA strongly supports HB 1823 with comments. The measure amends §269 101-110 to encourage the development of renewable energy in Hawaii by adjusting the cap on net metering and specifying the way in which energy generated by renewables is valued.

Since the dissolution of NEM in October of 2015 by the Public Utilities Commission of Hawaii, homeowners wishing to install grid connected solar systems on their homes have been given two new options: customer grid-supply (CGS) and customer self-supply (CSS). The HEI companies releases a weekly report on the amount of applications for various grid tie methods for all solar systems submitted for permitting and their respective position on the queue. Since the October NEM decision, the numbers in this report have stagnated. Essentially, not a single CGS or CSS application filed with the HEI companies on any of the participating islands has passed the initial review, much less moved into the technical review. In fact, in a recent HSEA member meeting, many of our members revealed that 95%-97% of their submitted CGS applications have been rejected by HEI for revision. One can only assume this is true across the board given the state of the weekly reports.

Furthermore, the new CGS rate model significantly decreases the return on investment of an individual solar system, making the systems more cost prohibitive for consumers and unfairly puts pressure on the market. In HECO's October 13th Press Release in response to the PUC decision, they state "The decision is the result of the first phase of the PUC's effort to develop long-term technical and policy solutions that will support the continued growth of rooftop PV in Hawaii." Since October, not a single new application has been approved for installation. Additionally, the length of the previous NEM agreement was around 3 pages, while the new CGS application is 42 pages long and requires a manual to complete.

There also exists a need to correctly and fairly value excess electricity generated by a consumer-generator. The current rate structure for the new CSS program sets the rate at \$0.1507/kWh, approximately half of the old NEM rate. This rate will be reexamined every two years, as opposed to being adjusted as needed for energy market fluctuations.



Hawaii Solar Energy Association

Serving Hawaii Since 1977

Given the current CGS rate structure, it is very difficult to properly size a solar system that will provide the maximum benefit to the customer.

Within HB 1823 at §269-102 on page 5 there is language pertaining to the interconnection of customer energy generators to the utility's electric grid. Special consideration should be given to how the utility and the PUC determine the ability of the electric grid to accept interconnected systems. There should be no reason an applicant is denied a new NEM agreement for oversaturation or grid reliability issues within the confines of this statute. The utility should provide accurate and compelling evidence for denial, with possible review by a third party.

Thank you for the opportunity to testify.

EEPttestimony

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 9:56 AM
To: EEPtestimony
Cc: AlternativeElectricBronson@gmail.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM
Attachments: REACHtestimonyreHB1823Feb62016.doc

HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Bronson Apana	Alternative Electric LLP.	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 8:47 AM
To: EEPtestimony
Cc: mattj@risingsunsolar.com
Subject: *Submitted testimony for HB1823 on Feb 9, 2016 08:00AM*

HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Matt Johnson	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 8:18 AM
To: EEPtestimony
Cc: KaiSupply@gmail.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Michael Dodge	Individual	Support	No

Comments: Aloha, I am in support of HB1823. We need to continue to support our solar industry here in Hawaii. We have been leading the nation in solar production due to our high energy costs. The Oct 2015 PUC ruling did not take into account several critical factors that would affect future homes producing solar energy while connected to the community grid. It is in the community's best interest to make a course correction and get Hawaii back on the renewable energy track. Thank You, Michael Dodge

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Testimony of STUART ZINNER
e-mail: zinner@hawaii.edu

In SUPPORT of HB 1823 RELATING TO NET ENERGY METERING

**Before the
HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION**

Tuesday, February 9, 2016 8:00 a.m.

Aloha, Chair Lee, Vice-Chair Lowen and members of the Committee.

My name is Stuart Zinner. I work on sustainability projects at UH Maui College and am also a principal at Maui Sustainable Energy LLC, a sustainable energy consultancy.

I am testifying as an individual in **SUPPORT** of HB 1823.

For many reasons, Hawaii leads the United States in solar power per capita¹, not the least of which were the State's progressive Net Energy Metering policies.

With a Decision and Order issued on October 12, 2015², the HPUC modified these policies. Although well intended, these modifications have gone too far in reducing the value of solar electricity to residential and small commercial customer-generators.

The question at the heart of the matter is the "*Value (of) the electricity generated by the eligible customer-generator and fed back to the electric grid*". HB 1823 states the value is "*to be determined for each calendar year by the public utilities commission, that reflects the value of such electricity to the utility, ratepayers, and the public as measured by avoided capacity costs, avoided operating and maintenance costs, avoided fuel costs, and avoided environmental costs.*"

Regrettably, this is not an easy value to determine. HB 1823 tries carefully to rebalance the competing requirements and come to a fair strategy for valuation of customer-generated distributed energy. I urge you to vote in favor of HB 1823.

Mahalo,

Stuart Zinner

-
1. **Hawaii leads the nation in solar power per capita**
HAWAII BUSINESS NEWS Sep 3, 2015 Duane Shimogawa
<http://www.bizjournals.com/pacific/news/2015/09/03/hawaii-leads-the-nation-in-solar-power-per-capita.html>
 2. **PUC Reforms Energy Programs to Support Future Sustainable Growth in Hawaii Rooftop Solar Market**
<http://puc.hawaii.gov/news-release/puc-reforms-energy-programs-to-support-future-sustainable-growth-in-hawaii-rooftop-solar-market/>

From: mailinglist@capitol.hawaii.gov
Sent: Sunday, February 07, 2016 3:54 PM
To: EEPtestimony
Cc: georgecattermole@earthlink.net
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

HB1823

Submitted on: 2/7/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
George Cattermole	Individual	Support	No

Comments: Correct your mistake - set the rate at the true value so it will be fair and encourage more renewable energy production by everyone. NEM needs to be expanded if we are to reach 100% renewables. Dr. George Cattermole Waikiki

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From: mailinglist@capitol.hawaii.gov
Sent: Sunday, February 07, 2016 11:25 AM
To: EEPtestimony
Cc: lisamarten@hawaii.rr.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

HB1823

Submitted on: 2/7/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Lisa Marten	Individual	Support	No

Comments: Aloha Chair and Committee members. I support HB 1823 as it sets up a process for finding an equitable price for those that provide solar energy to HECO, for finding a manageable level of electricity coming in to the grid, and sets up mechanisms to adjust those over time as appropriate. We want a Net Energy Metering program that works for our State and supports the transition to 100% renewable energy. We do not want to kill the program with an over-reaction by the PUC that discounts the value of that source of clean energy and that is more cautious about the impact on the grid than is actually merited. Thank you, Lisa

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From: mailinglist@capitol.hawaii.gov
Sent: Sunday, February 07, 2016 10:06 AM
To: EEPtestimony
Cc: dylanarm@hawaii.edu
Subject: *Submitted testimony for HB1823 on Feb 9, 2016 08:00AM*

HB1823

Submitted on: 2/7/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Dylan Armstrong	Individual	Support	No

Comments:

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Testimony in support of HB 1823 relating to Net Energy Metering (NEM)

I am in support of HB 1823 due to the following reasons:

1. This bill supports existing state mandate of 100% renewable energy goals.
2. This bill provides relief to rate payers in the state who are burdened with highest cost of electricity in the entire nation.
3. This bill supports the fight against climate change and creates a sustainable Hawaiian environment and economy.
4. This bill saves billions of dollars spent to purchase dirty fossil fuels to generate electricity in Hawaii and the money stays in Hawaii.
5. This bill decouples electricity generation cost from cost of oil which is volatile.
6. This bill supports the growth of new solar/renewable industry in the state
7. This bill generates jobs for Hawaiian economy due to solar/renewable energy projects
8. This bill strengthens the power of the consumer to generate his/her own electricity without being dependent on the monopoly of Hawaiian Electric.
9. Hawaiian Electric has not upgraded its grid to support renewable energy growth. Stopping NEM is not the logical solution to the problem of grid saturation. Hawaiian Electric should be required to upgrade its grid network periodically keeping up with technology and safety norms.
10. Hawaiian Electric has not installed sufficient Battery Banks to store excess electricity produced during the day/off peak for use during night/peak times. Recently there was a RFP issued and bids collected by Hawaiian Electric. However, no further action has been taken on awarding a contract to acquire a suitable Battery Bank to support Hawaiian Electric Grid. If this bill is not passed, it will only reward inaction on the part of Hawaiian Electric.
11. The cost of electricity generated and provided to the grid by NEM customers should be scientifically assessed and valued so to show the true savings to Hawaiian Electric.
12. Hawaiian Electric has conducted tests with Advanced Inverters and has found that increasing renewable energy penetration on their circuits up 250% of the Daytime Minimum Load (DML) is easily possible without any safety concerns. This bill will enable all circuits to achieve as a beginning this proven penetration of 250% of DML.
13. Stopping or restricting NEM abruptly on 10/13/2015 creates an inequitable position to all citizens who were planning to install a renewable energy system. This bill allows such citizens to realize their dream of installing a renewable energy system under NEM.
14. Non dependence on imported oil creates an advantageous security position for Hawaii

Mahalo

Charles Chacko

EEPttestimony

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 10:09 AM
To: EEPtestimony
Cc: hubbadoob@yahoo.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM
Attachments: REACHtestimonyreHB1823Feb62016 (1).doc

HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Andrew Hubbard	Individual	Support	No

Comments:

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4. This bill saves billions of dollars spent to purchase dirty fossil fuels to generate electricity in Hawaii and the money stays in Hawaii.
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6. This bill supports the growth of new solar/renewable industry in the state
7. This bill generates jobs for Hawaiian economy due to solar/renewable energy projects
8. This bill strengthens the power of the consumer to generate his/her own electricity without being dependent on the monopoly of Hawaiian Electric.
9. Hawaiian Electric has not upgraded its grid to support renewable energy growth. Stopping NEM is not the logical solution to the problem of grid saturation. Hawaiian Electric should be required to upgrade its grid network periodically keeping up with technology and safety norms.
10. Hawaiian Electric has not installed sufficient Battery Banks to store excess electricity produced during the day/off peak for use during night/peak times. Recently there was a RFP issued and bids collected by Hawaiian Electric. However, no further action has been taken on awarding a contract to acquire a suitable Battery Bank to support Hawaiian Electric Grid. If this bill is not passed, it will only reward inaction on the part of Hawaiian Electric.
11. The cost of electricity generated and provided to the grid by NEM customers should be scientifically assessed and valued so to show the true savings to Hawaiian Electric.
12. Hawaiian Electric has conducted tests with Advanced Inverters and has found that increasing renewable energy penetration on their circuits up 250% of the Daytime Minimum Load (DML) is easily possible without any safety concerns. This bill will enable all circuits to achieve as a beginning this proven penetration of 250% of DML.
13. Stopping or restricting NEM abruptly on 10/13/2015 creates an inequitable position to all citizens who were planning to install a renewable energy system. This bill allows such citizens to realize their dream of installing a renewable energy system under NEM.
14. Non dependence on imported oil creates an advantageous security position for Hawaii

Mahalo

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 11:30 AM
To: EEPtestimony
Cc: htamas@ses-solar.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Holli Tamas	Individual	Support	No

Comments: Testimony of Holli Tamas Hawaiian Energy Systems e-mail: htamas@ses-solar.com In SUPPORT of HB 1823 RELATING TO NET ENERGY METERING Before the HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION Tuesday, February 9, 2016 8:00 a.m. Aloha, Chair Lee, Vice-Chair Lowen and members of the Committee. My name is Holli Tamas. I am a owner of Hawaiina Energy Systems, a solar power company. Hawaiian Energy Systems is in SUPPORT of HB 1823. Under NEM, utility customers generate clean renewable energy for their own use and send their excess renewable energy to the grid for use by other utility customers. The PUC noticed that, under the utility's NEM program, the excess energy sent to the grid was being given an arbitrarily high value. The arbitrarily high value meant that NEM customers were gaining wealth at the expense of non-NEM customers. The PUC dealt with the transfer of wealth issue by mistakenly setting an arbitrarily low value for the excess energy sent to grid. The PUC's mistake is closing the market for excess renewable energy sent to the grid. The PUC's mistake is putting as many as a thousand people out of work. What the bill does: • Corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by valuing excess renewable energy sent to the grid at a rate "that reflects the value of such electricity to the utility, ratepayers and the public as measured by avoided capacity costs, avoided operating and maintenance costs, avoided fuel costs and avoided environmental costs" (the Value of Renewable or "VOR" rate) • PUC annually determines the Value of Renewable rate • Increases the NEM system capacity limit from 50 kW to 1 MW • Increases the NEM aggregate capacity limit from ½ % of peak demand to the aggregate amount of such capacity that could be interconnected with the utility's electric system without substantial expenditure, as may be determined by the commission, by the utility for new mitigation facilities to maintain reliability of electric service • Prohibits the utility from assessing interconnection requirements study charges and supplemental review charges against NEM customers Summary: The bill corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by requiring that the HECO utilities value excess energy sent to the grid at a rate, determined by the PUC, that reflects the true economic value of such energy to all customers and to the general public. NEM needs to be expanded -- by raising capacity

limits and by prohibiting discriminatory charges to NEM customers -- because Hawaii needs all the low-cost, decentralized, grid-connected renewable generation it can get for the day when imported fuels stop flowing to Hawaii. Thank you for allowing me to testify.
Holli Tamas

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Testimony in support of HB 1823 relating to Net Energy Metering (NEM)

I am in support of HB 1823 due to the following reasons:

1. This bill supports existing state mandate of 100% renewable energy goals.
2. This bill provides relief to rate payers in the state who are burdened with highest cost of electricity in the entire nation.
3. This bill supports the fight against climate change and creates a sustainable Hawaiian environment and economy.
4. This bill saves billions of dollars spent to purchase dirty fossil fuels to generate electricity in Hawaii and the money stays in Hawaii.
5. This bill decouples electricity generation cost from cost of oil which is volatile.
6. This bill supports the growth of new solar/renewable industry in the state
7. This bill generates jobs for Hawaiian economy due to solar/renewable energy projects
8. This bill strengthens the power of the consumer to generate his/her own electricity without being dependent on the monopoly of Hawaiian Electric.
9. Hawaiian Electric has not upgraded its grid to support renewable energy growth. Stopping NEM is not the logical solution to the problem of grid saturation. Hawaiian Electric should be required to upgrade its grid network periodically keeping up with technology and safety norms.
10. Hawaiian Electric has not installed sufficient Battery Banks to store excess electricity produced during the day/off peak for use during night/peak times. Recently there was a RFP issued and bids collected by Hawaiian Electric. However, no further action has been taken on awarding a contract to acquire a suitable Battery Bank to support Hawaiian Electric Grid. If this bill is not passed, it will only reward inaction on the part of Hawaiian Electric.
11. The cost of electricity generated and provided to the grid by NEM customers should be scientifically assessed and valued so to show the true savings to Hawaiian Electric.
12. Hawaiian Electric has conducted tests with Advanced Inverters and has found that increasing renewable energy penetration on their circuits up 250% of the Daytime Minimum Load (DML) is easily possible without any safety concerns. This bill will enable all circuits to achieve as a beginning this proven penetration of 250% of DML.
13. Stopping or restricting NEM abruptly on 10/13/2015 creates an inequitable position to all citizens who were planning to install a renewable energy system. This bill allows such citizens to realize their dream of installing a renewable energy system under NEM.
14. Non dependence on imported oil creates an advantageous security position for Hawaii

Mahalo

Daniel Im

EEPttestimony

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 1:06 PM
To: EEPttestimony
Cc: Charles@risingsunsolar.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM
Attachments: REACHtestimonyreHB1823Feb62016.doc

HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Charles WL Moore	Individual	Support	No

Comments: NEM needs to return to Hawaii. The sudden loss of NEM metering has lead to a decrease in demand for solar energy systems across the state, which in turn has lead to decrease in the work for solar energy workers. If we are to get Hawaii to 100% renewable energy by 2045 we are going to need all the we can get, and until we decide to upgrade our grids NEM metering is the best way to get there. If one of the most profitable energy companies in the country is noticing a loss in profits, they can and should begin with introducing a TOU (time of use) billing policy to reflect the added costs of producing energy during peak hours. That is the next logical step towards a smarter grid capable of managing a 100% renewable energy grid. Mahalo for this consideration.

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LATE

DAVID Y. IGE
GOVERNOR
SHAN S. TSUTSUI
LT. GOVERNOR

STATE OF HAWAII
OFFICE OF THE DIRECTOR
DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS
335 MERCHANT STREET, ROOM 310
P.O. Box 541
HONOLULU, HAWAII 96809
Phone Number: 586-2850
Fax Number: 586-2856
www.hawaii.gov/dcca

CATHERINE P. AWAKUNI COLÓN
DIRECTOR
JO ANN M. UCHIDA TAKEUCHI
DEPUTY DIRECTOR

TO THE HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION

THE TWENTY-EIGHTH LEGISLATURE
REGULAR SESSION OF 2016

TUESDAY, FEBRUARY 9, 2016
8:00 A.M.

TESTIMONY OF JEFFREY T. ONO, EXECUTIVE DIRECTOR, DIVISION OF
CONSUMER ADVOCACY, DEPARTMENT OF COMMERCE AND CONSUMER
AFFAIRS, TO THE HONORABLE CHRIS LEE, CHAIR,
AND MEMBERS OF THE COMMITTEE

HOUSE BILL NO. HB 1823 - RELATING TO NET ENERGY METERING

DESCRIPTION:

This measure proposes to increase capacity limits on net energy metering and establish excess energy volumes for systems installed after June 30, 2016.

POSITION:

The Division of Consumer Advocacy ("Consumer Advocate") opposes this bill.

COMMENTS:

The Public Utilities Commission ("PUC") and dozens of stakeholders have been immersed in the PUC's Distributed Energy Resources ("DER") docket for months, and the relevant preceding dockets for years before that. Last October, the PUC issued a decision and order in Phase I of the DER docket, declaring the net energy metering program fully subscribed for the Hawaiian Electric Companies, as the program has been on Kauai for several years. The PUC determined that the net energy metering program had served its intended purpose, but also that the program was no longer sending the appropriate price signals to the market. In the place of net metering, which compensated for energy exported to the grid at the retail rate, the PUC's Phase I decision and order created a self-supply tariff and a grid-supply tariff. The former limits the capacity of individual participating systems at 100 kilowatts, but does not limit total

participation in the program. The latter limits total participation in the program to twenty-five megawatts on Oahu and five megawatts each in the Maui Electric and Hawaii Electric Light service territories. Also, it compensates for energy exported to the grid at a rate close to the estimated avoided cost of generation.

After the PUC issued its Phase I decision and order, parties to the docket promptly commenced further proceedings to work on long-term policy proposals in Phase II. In those ongoing technical meetings for Phase II, the parties are studying the hosting capacities for distributed generation on the Hawaiian Electric grids, at both the distribution circuit levels and system levels. They are also studying the value of energy exported to the grid.

This bill would undermine the interim policies that the PUC put forward in its decision and order in Phase I to deal with urgent issues. The grid's ultimate capacity for distributed generation will be best addressed by the work already underway in Phase II of the DER docket, as will a careful determination of the value of energy exported to the grid. If this bill were enacted, would the PUC have to interrupt current proceedings and reconsider the issues for Phase II? Or would the parties to the DER docket have to abandon current work on Phase II entirely and revisit Phase I?

Thank you for this opportunity to testify.



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

Date: 02/09/2016
Time: 08:00 AM
Location: 325
Committee: House Energy & Environmental
Protection

Department: Education

Person Testifying: Kathryn S. Matayoshi, Superintendent of Education

Title of Bill: HB 1823 RELATING TO NET ENERGY METERING.

Purpose of Bill: Increases customer-generator capacity limits on net energy metering (NEM) and sets the value of electricity generated by qualified customer-generators and fed back to the electric grid at a rate determined each year by the Public Utilities Commission (PUC).

Department's Position:

The Department of Education (DOE) supports the intent of H.B. No. 1823.

The amendments to Part VI of Chapter 269, Hawaii Revised Statutes (HRS) proposed in H.B. No. 1823 will allow the DOE to build larger photo voltaic (PV) systems at school (from the current 100 kilowatts authorized by the PUC to 1 megawatt).

Larger PV systems would assist the DOE to meet its goal of utilizing 90 percent clean energy by the year 2040 and address the long term trend of higher electricity bills, especially with the on-going effort to install air conditioners in more of our classrooms.

We would also like to note the following concerns:

- H.B. No. 1823's proposed changes to Sections 269-102(b), 269-105, 269-106, 269-107, 269-108, 269-109, and 269-10, HRS, appear to limit existing statutory language to customer-generator facility or hybrid systems connected to the utility's transmission and distribution facilities on or before June 30, 2016. As such, the same statutes governing NEM projects may not apply to systems connected to the utility's transmission and distribution facilities after June 30, 2016.
- The statutory amendments outlined in Section 4 of H.B. No. 1823 were to an

outdated version of Chapter 269-102, HRS, which was amended by Act 150, SLH 2008.

Thank you for this opportunity to testify on this measure.

House Bill 1823 – Relating to Net Energy Metering
Testimony of Hermina Morita

I oppose this bill for the following reasons.

Net energy metering (NEM) was a program to encourage early adoption of renewable energy in its infancy. When the statute was amended in 2001 there was a recognition that NEM would need to be reviewed periodically. Therefore, a NEM system cap (.5% of system peak) was established and later the law was further amended to allow the Public Utilities Commission (PUC) to review and change the program if and when necessary.

Currently, the PUC is in the midst of its distributed energy resources investigation (Docket No. 2014-0192) which included a decision and order issued in October 2015 to end NEM and replace it with two other types of tariffs concluding the first phase of highly technical proceedings. This bill usurps that proceeding at the expense of the electricity ratepayer/customer who does not own or have access to a rooftop photovoltaic (pv) system.

At this high level of rooftop photovoltaic integration, NEM creates an inequity where the NEM customer avoids paying its fair share of fixed costs, shifting this cost to the ratepayer/customer who does not own or have access to a rooftop pv system. The total lost contribution to fixed cost for the HECO Companies has increased from an estimated \$19 million based on installed NEM capacity at the of 2012, to \$38 million at the end of 2013, to \$53 million at the end of 2014, and to an annualized rate of \$64 million in 2015.

The NEM program combined with the State's renewable energy income tax credit has created a highly subsidized and uncompetitive solar market on the backs of ratepayers/customers who are primarily low-come, renters or live in multi-family units and the general fund.

Thank you for allowing me to share my views.

Hermina Morita
P.O. Box 791
Hanalei, Hawaii 96714

February 8, 2016

Roy Skaggs

1804 Ala Moana Blvd #18A

Honolulu, HI 96815

Aloha, Chair Lee, Vice-Chair Lowen and members of the Committee,

My name is Roy Skaggs and I am in strong support of House Bill 1823. I work in renewable energy and it has been a blessing for my family and thousands of Hawaiians. The NEM program is what really made people get on board and help to increase the amount of rooftop PV by astounding numbers. Of course, that and the wonderful tax credits people can get from the Fed and our proud state of Hawaii.

HECO started a strong campaign of "safety" in 2013 but it hasn't been backed by any proof, just words. The saturation limits have been raised from 100% to 120% to now 250%. If you recall, Dr. Steven Chu called HECO's argument BS (he didn't shorten it) about the issue of safety and saturation. He noted Oahu would need to be 20% saturated before it even needing to be looked into.

HECO also started another claim of "cost-shifting" to gain public support by making PV owners the wealthy folks who can afford PV, although there are many programs that allow anyone to get PV. Someone without PV doesn't want to pay for someone with. Seems simple until you look into HECO's bogus claims of \$53mm without taking into account many factors that prove the public without PV absolutely did not pay \$53mm for the people with. Yet, HECO gets away with bogus claim after bogus claim. And somehow, the PUC buys into it!

This issues led to the PUC making an awful decision to end NEM, but even worse going further than what HECO proposed. HECO proposed to pay \$.18 cents per kWh, the PUC went for \$.1507 cents. Why? HB1823 will get this error fixed. The 25 mW cap imposed by the PUC was another mistake and one that is much more worrisome for those like myself in renewable energy. There are hundreds to possibly thousands of jobs at stake once that cap is hit. Are we actually going to tell people later this year that they can't get solar unless they buy expensive batteries? The grid can handle more PV, it's just that HECO doesn't want to pay for it! They certainly don't mind selling it though. When battery technology gets better and prices come down over the next couple years, there is going to be a reckoning for the utility. We need to help HECO not cut itself at the knees and encourage people to get solar and sell it to the utility. Otherwise, they will see a death spiral and then the people without PV will certainly feel the pain as HECO continues to raise their rates for the people leaving the grid entirely.

We can set this right and get NEM back with some adjustments. Everyone understand retail buyback is too high, but to drop it as low as the PUC did combined with the other issues I pointed out will kill off the solar industry in Hawaii for a while.

We recently got an F rating for solar! That's pretty embarrassing for a sunshine filled state like Hawaii.

Respectfully,

Roy Skaggs

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 3:28 PM
To: EEPtestimony
Cc: garyjcapozzola@gmail.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM



HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Gary Capozzola	Individual	Support	No

Comments: I am in support of HB 1823. Under NEM, utility customers generate clean renewable energy for their own use and send their excess renewable energy to the grid for use by other utility customers. The PUC noticed that, under the utility's NEM program, the excess energy sent to the grid was being given an arbitrarily high value. The arbitrarily high value meant that NEM customers were gaining wealth at the expense of non-NEM customers. The PUC dealt with the transfer of wealth issue by mistakenly setting an arbitrarily low value for the excess energy sent to grid. The PUC's mistake is closing the market for excess renewable energy sent to the grid. The PUC's mistake is putting as many as a thousand people out of work. What the bill does:

- Corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by valuing excess renewable energy sent to the grid at a rate "that reflects the value of such electricity to the utility, ratepayers and the public as measured by avoided capacity costs, avoided operating and maintenance costs, avoided fuel costs and avoided environmental costs" (the Value of Renewable or "VOR" rate)
- PUC annually determines the Value of Renewable rate
- Increases the NEM system capacity limit from 50 kW to 1 MW
- Increases the NEM aggregate capacity limit from ½ % of peak demand to the aggregate amount of such capacity that could be interconnected with the utility's electric system without substantial expenditure, as may be determined by the commission, by the utility for new mitigation facilities to maintain reliability of electric service
- Prohibits the utility from assessing interconnection requirements study charges and supplemental review charges against NEM customers

Summary: The bill corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by requiring that the HECO utilities value excess energy sent to the grid at a rate, determined by the PUC, that reflects the true economic value of such energy to all customers and to the general public. NEM needs to be expanded -- by raising capacity limits and by prohibiting discriminatory charges to NEM customers -- because Hawaii needs all the low-cost, decentralized, grid-connected renewable generation it can get for the day when imported fuels stop flowing to Hawaii. Thank you for allowing me to testify.

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From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 3:51 PM
To: EEPtestimony
Cc: dylanarm@hawaii.edu
Subject: *Submitted testimony for HB1823 on Feb 9, 2016 08:00AM*



HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Dylan Armstrong	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 10:58 PM
To: EEPtestimony
Cc: nick.azari@arionenergy.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

LATE

HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Nick Azari	Arion Energy	Support	Yes

Comments: My name is Nick Azari. I am the CEO and President of Arion ENERGY, a wind and solar project developer in the State of Hawaii. Arion Energy is in SUPPORT of HB 1823. Under NEM, utility customers generate clean renewable energy for their own use and send their excess renewable energy to the grid for use by other utility customers. The PUC noticed that, under the utility's NEM program, the excess energy sent to the grid was being given an arbitrarily high value. The arbitrarily high value meant that NEM customers were gaining wealth at the expense of non-NEM customers. The PUC dealt with the transfer of wealth issue by mistakenly setting an arbitrarily low value for the excess energy sent to grid. The PUC's mistake is closing the market for excess renewable energy sent to the grid. The PUC's mistake is putting as many as a thousand people out of work. What the bill does: • Corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by valuing excess renewable energy sent to the grid at a rate "that reflects the value of such electricity to the utility, ratepayers and the public as measured by avoided capacity costs, avoided operating and maintenance costs, avoided fuel costs and avoided environmental costs" (the Value of Renewable or "VOR" rate) • PUC annually determines the Value of Renewable rate • Increases the NEM system capacity limit from 50 kW to 1 MW • Increases the NEM aggregate capacity limit from ½ % of peak demand to the aggregate amount of such capacity that could be interconnected with the utility's electric system without substantial expenditure, as may be determined by the commission, by the utility for new mitigation facilities to maintain reliability of electric service • Prohibits the utility from assessing interconnection requirements study charges and supplemental review charges against NEM customers Summary: The bill corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by requiring that the HECO utilities value excess energy sent to the grid at a rate, determined by the PUC, that reflects the true economic value of such energy to all customers and to the general public. NEM needs to be expanded -- by raising capacity limits and by prohibiting discriminatory charges to NEM customers -- because Hawaii needs all the low-cost, decentralized, grid-connected renewable generation it can get for the day when imported fuels stop flowing to Hawaii. Thank you for allowing me to testify.

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Sent: Monday, February 08, 2016 8:08 PM
To: EEPtestimony
Cc: ben.prmed@gmail.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

HB1823

Submitted on: 2/8/2016
Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Benjamin Vine	Solar Services Hawaii	Support	No

Comments: Under NEM, utility customers generate clean renewable energy for their own use and send their excess renewable energy to the grid for use by other utility customers. The PUC noticed that, under the utility’s NEM program, the excess energy sent to the grid was being given an arbitrarily high value. The arbitrarily high value meant that NEM customers were gaining wealth at the expense of non-NEM customers. The PUC dealt with the transfer of wealth issue by mistakenly setting an arbitrarily low value for the excess energy sent to grid. The PUC’s mistake is closing the market for excess renewable energy sent to the grid. The PUC’s mistake is putting as many as a thousand people out of work.

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**Testimony of Ron Hooson
Master Electrician, Electrical Contractor,
Owner Solar Inspectors Hawaii
Secretary, Board Member, Hawaii Solar Energy Association**

1384 Aupupu St
Kailua, Hawaii 96734
Tel: (808) 542-6200
Ron@SolarInspectorsHawaii.com

LATE

In SUPPORT of HB 1823 RELATING TO NET ENERGY METERING

**Before the
HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION**

Tuesday, February 9, 2016 8:00 a.m.

Aloha, Chair Lee, Vice-Chair Lowen and members of the Committee.

My name is Ron Hooson. I have over 40 years of trade experience in the electrical, construction and alternative energy fields including extensive work with the National Oceanic and Atmospheric Administration, the National Wind Technology Center, Honeywell's Energy Center One, Trane Mechanical, Ball Aerospace and Bechtel Corporation working on utility powerhouse control room monitoring systems and long haul high voltage transmission systems both new construction and retrofits.

I SUPPORT of HB 1823.

I have been an Intervener on PUC Docket 2014-0192 and have been at all of the meetings over the last year. During those meetings a great deal of information was discussed regarding future iterations of the NEM program and possible ways to evolve it to best serve all Hawaiian customers with a technologically sound and economically fair NEM model. California among other states have been spending a great deal of time and money in similar efforts and are providing us with sound policy models to consider. The sudden and unexpected ending of the Hawaii NEM program before the resent decisions by other states could be reviewed and discussed has crippled the solar industry here in Hawaii. The solar industry had been providing the greatest measurable advances helping Hawaii to move toward it's clearly stated goal of 100% renewable power.

The NREL test study has proven Nobel Prize winning Physicist and former Energy Secretary Dr. Steven Chu was correct. Solar energy production has been proven not to be a threat to grid stability and safety as those who had claimed 25%, 50%, 125% and 250% of "daytime minimum load" as hard barriers that could not be exceeded had wanted us to believe. Alternating current can, and indeed does 60 times per second reverse current flow. The Laws of Physics have always, and continue to prove that solar is safe for the grid.

The solar consumer needs an economic model that motivates them to take action. The NEM program coupled with the tax credits did that. Batteries double the cost of a solar system and need to be replaced every four to ten years depending on the chemistry and maintenance. This reoccurring additional cost, even with initial tax credits that have

been proposed removes the economic drive for customers to add batteries to a solar system.

Over half of the battery manufacturers from ten years ago have filed bankruptcy, unable to meet their warranty claims. This was due to the teething problems that they encountered as the solar, wind and battery industries tried to figure out heat dissipation, charge/discharge rates and depths, that would work for both the batteries and the alternative energy sources. The North Shore battery project fire is a clear and local example.

Several battery manufacturers are getting very close to solving the earlier problems by integrating layers of software to monitor and control the charge/discharge cycle depth and duration based on continually updated internal runtime battery monitoring and real time intuitive demand modeling. The most significant challenge is the additional cost. Without a viable NEM program coupled with tax credits, at least for the next three years, the battery integration model cannot survive.

The battery integration model is critical to helping move Hawaii toward alternative energy sources. It will peak load shift, reducing capital expenditures for the utility. With advanced inverter functionality there is not enough roof space in the state for PV to fill that could hurt the grid. The NREL testing has proven that point. Spinning reserve is the only mathematical model left to be concerned with. Batteries are the answer to spinning reserve.

Batteries and advanced inverter functionality will be the answers to Hawaii's future but the current lack of economic incentive caused by the cancelation of NEM is the roadblock. This Bill would remove the roadblock.

Summary:

The bill corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by requiring that the HECO utilities value excess energy sent to the grid at a rate, determined by the PUC, that reflects the true economic value of such energy to *all* customers and to the general public.

NEM needs to be expanded -- by raising capacity limits and by prohibiting discriminatory charges to NEM customers -- because Hawaii needs all the low-cost, decentralized, grid-connected renewable generation it can get for the day when imported fuels stop flowing to Hawaii.

Other states are making weekly breakthroughs on total package NEM compensation rates. We need to fairly value energy exported to the grid.

Thank you for allowing me to testify.

Ron Hoason

Licensed Master Electrician,
Licensed Supervising Electrician,
Licensed Electrical Contractor
IAEI Member

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 08, 2016 6:59 PM
To: EEPtestimony
Cc: thomashall@solarspecialtygroup.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

LATE

HB1823

Submitted on: 2/8/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Thomas Hall	Individual	Support	No

Comments: I support this Bill.

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From: mailinglist@capitol.hawaii.gov
Sent: Tuesday, February 09, 2016 7:21 AM
To: EEPtestimony
Cc: josh@mauisolarproject.org
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

HB1823

Submitted on: 2/9/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Josh Porter	Individual	Support	No

Comments: The PUC has done a grave disservice to our community by caving to the demands of a for-profit utility and authorizing the shutdown of NEM. We should be embracing NEM and expanding the program. Former federal energy secretary Steven Chu's comments about the technical challenges faced are revealing. He called them for what they are untrue. We can expand NEM and embrace energy storage and do it immediately to not only save thousands of jobs but also speed our way to meeting our renewable energy goals. We should not let for profit monopolies like HEI dictate the health of our community. We should be charting our own course.

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From: mailinglist@capitol.hawaii.gov
Sent: Tuesday, February 09, 2016 8:46 AM
To: EEPtestimony
Cc: tiffanyw@risingsunsolar.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM
Attachments: REACHtestimonyreHB1823Feb62016.doc

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HB1823

Submitted on: 2/9/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Tiffany Wagner	Individual	Support	No

Comments:

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EEPtestimony

From: mailinglist@capitol.hawaii.gov
Sent: Tuesday, February 09, 2016 8:44 AM
To: EEPtestimony
Cc: mel@risingsunsolar.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM



HB1823

Submitted on: 2/9/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Melanie Kotter	Individual	Support	No

Comments:

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**PLUG AND PLAY
ENERGY SYSTEMS LLC**

LATE



NEM should NOT be restored in Hawaii

NEM creates and encourages grid instability

Distributed Energy Resources (DER) long term solution using safe, reliable battery storage

Rule 14 provides a pathway for 100% renewables and grid stability

Legislature must increase incentives for PV and storage development

Tax credits and rebates would offset capital costs of rooftop PV and storage

PlugandPlayEnergySystems.com

Monets001@hawaii.rr.com

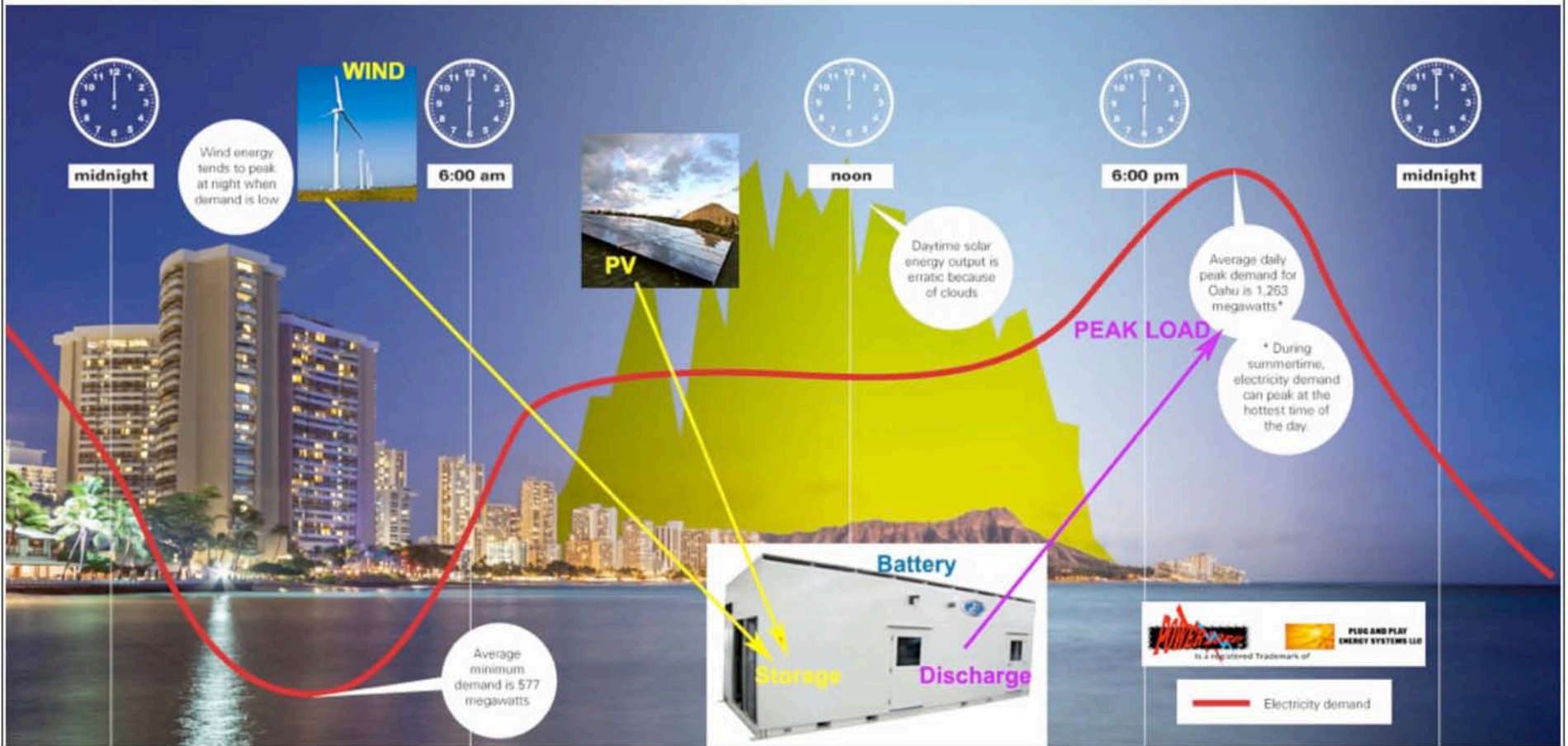


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Oahu average daily peak demand at 7:30p.m.: 1,263 MW
Average minimum at 3a.m.: 577MW

Solar is erratic due to cloud cover

Wind is usually at night when demand is low, *28% trade wind decrease over last 45 years, will continue to decline due to global warming





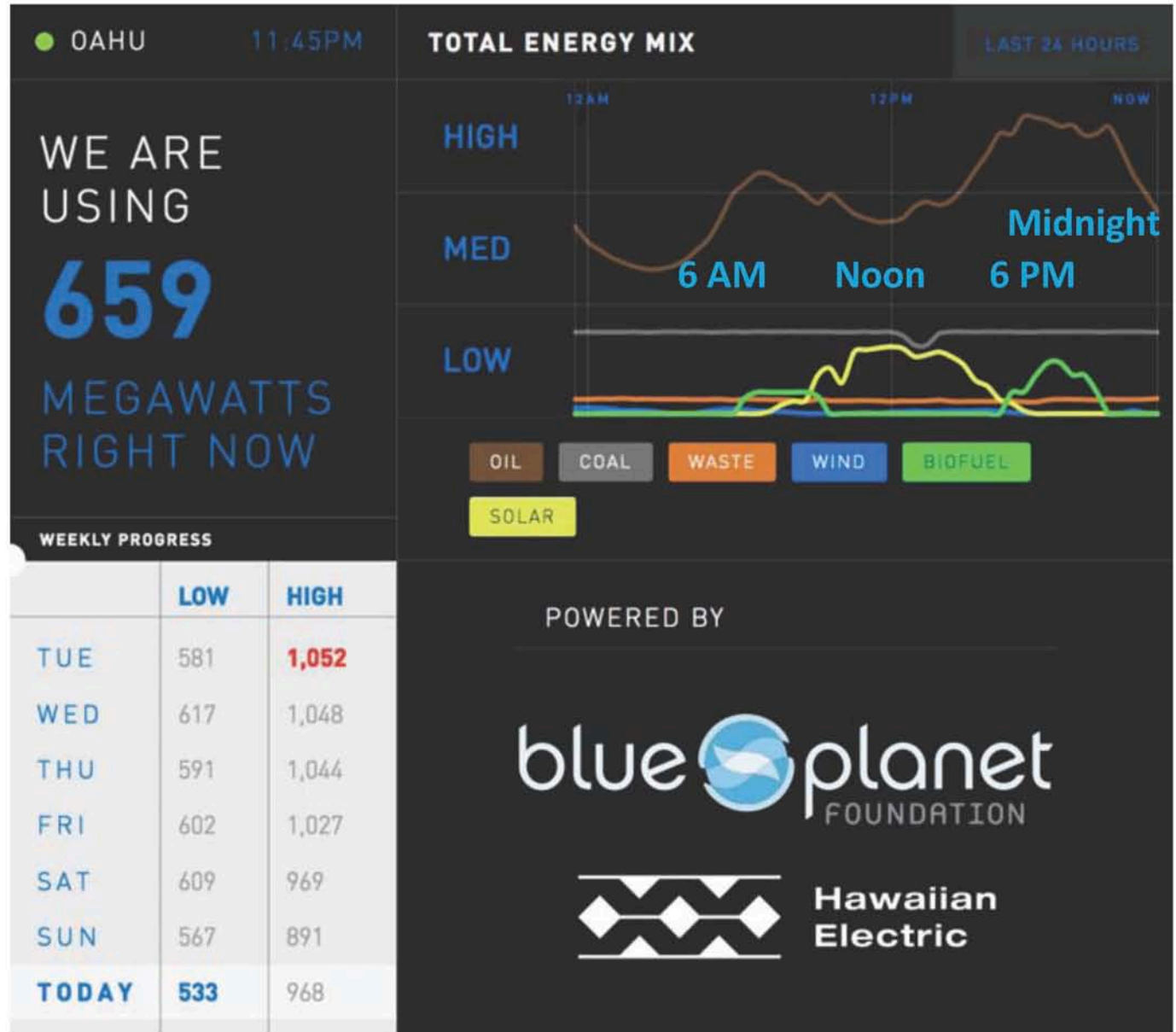
February 8, 2016

Residential Battery Storage (RESS) would reduce HECO demand at Peak load.

Ratepayers with PV and storage would store energy at the "Q" rate.

Increase grid stability

Tax credits and rebates to include battery storage would encourage and stimulate more rooftop PV and battery storage



Source: <http://islandpulse.org>



Is a registered Trademark of

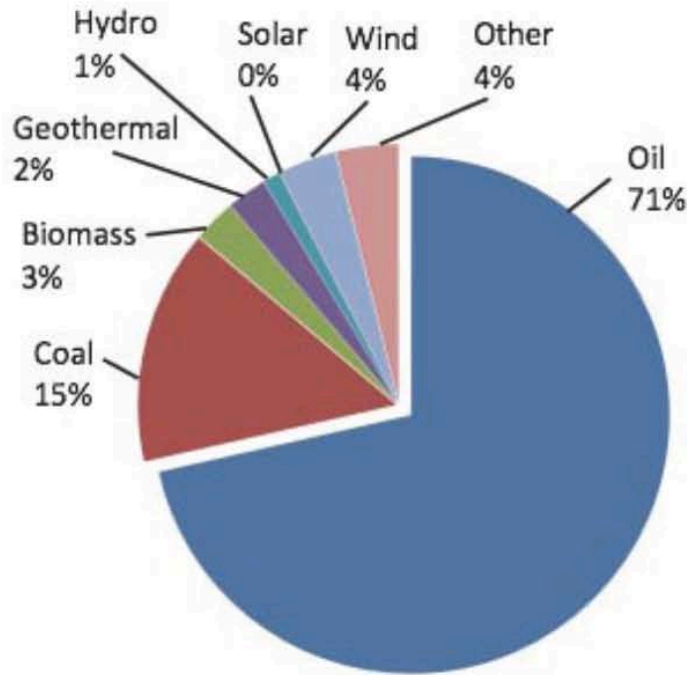


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Hawaii is the only state that depends so heavily on petroleum for its energy needs. Whereas less than 1% of electricity in the nation is generated using oil, in 2012 Hawaii relied on oil for 71% and on coal for 15% of its electricity generation.¹

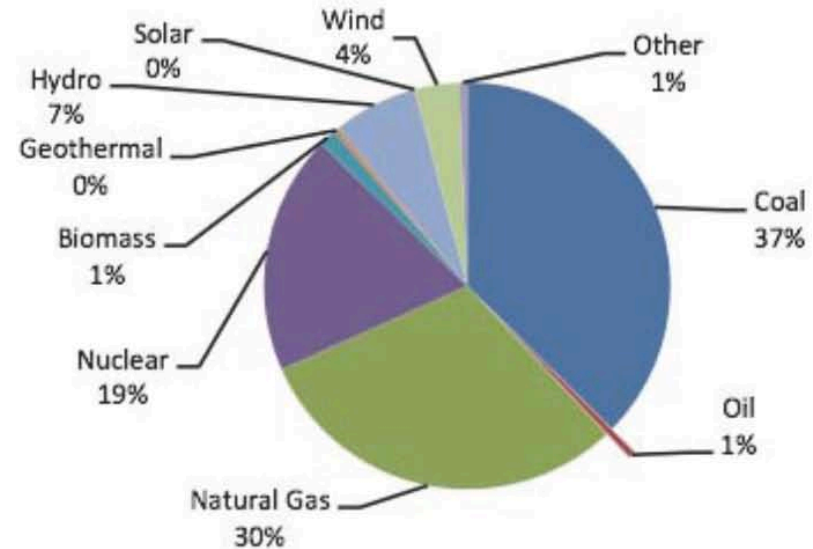
Hawaii

Electricity Production by Source, 2012



U.S.

Electricity Production by Source, 2012



DBEDT 2014

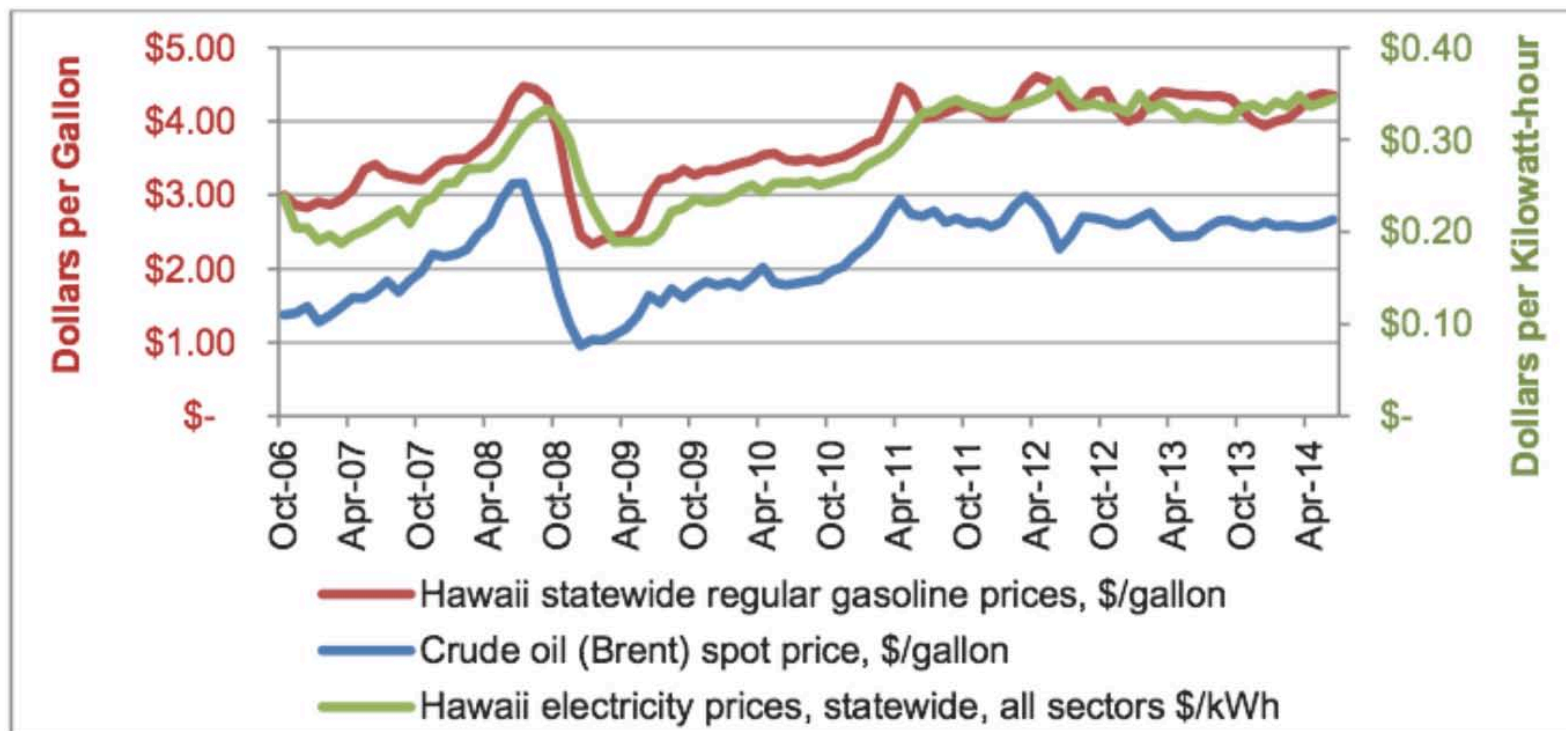
Hawaii's electricity prices are three times higher than the U.S. average.^{2 3}



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In Hawaii, both electricity and gasoline prices **follow the price of petroleum**. The graph below shows the prices of Brent crude oil, gasoline, and electricity.⁵



Electricity and gasoline are just part of Hawaii's energy picture. Large quantities of jet fuel are also used (this is different from the Mainland, where most petroleum is used for ground transportation). In Hawaii, roughly equal amounts of petroleum are used for electricity production, ground transportation, and commercial aviation, with the rest used for marine transport, military, and other uses.⁶

DBEDT 2014

OPEC

Monthly Oil Market Report

15 January 2015

Feature article:
Monetary policies and their impact on the oil market

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World economy	17
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OPEC's stated goal:
Increase crude supply to
bankrupt American fracking,
Canadian shale and large
scale solar developments
world wide

Saudi Arabia lost \$100billion
in oil revenues in 2015

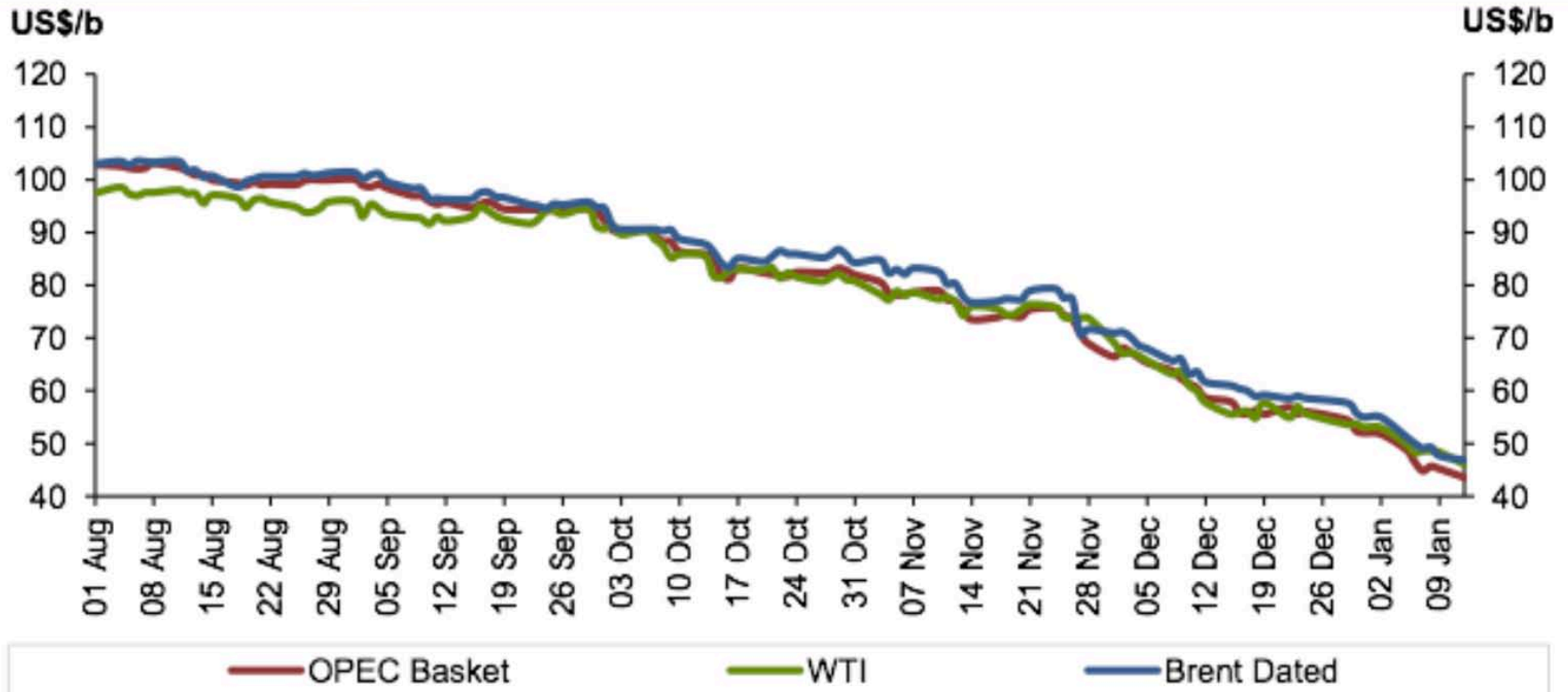
Crude Oil Price Movements



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Graph 1.1: Crude oil price movement, 2014-2015



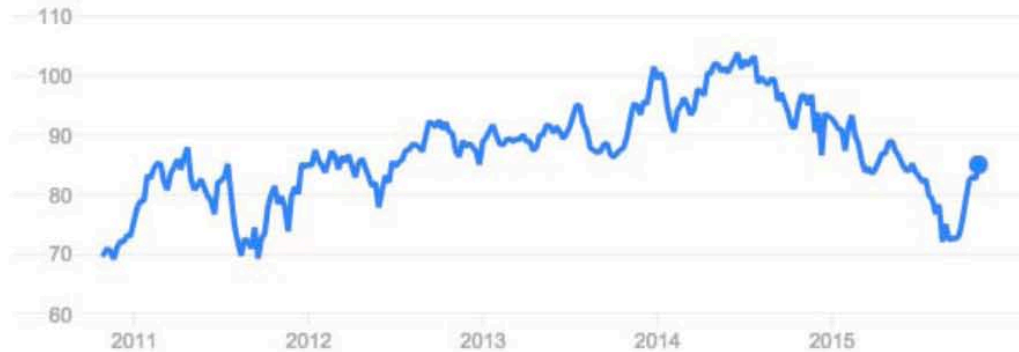
All **ORB component values** slipped sharply in December as oil benchmark prices continued to fall to record lows. The main benchmarks – North Sea Dated Brent, US light sweet marker WTI, Dubai and Oman – have all lost about \$16.50 over the month.

Exxon Mobil Corporation

NYSE: XOM - Nov 5 12:44 PM EST

85.34 +0.64 (0.74%)

1 day 5 day 1 month 3 month 1 year 5 year max

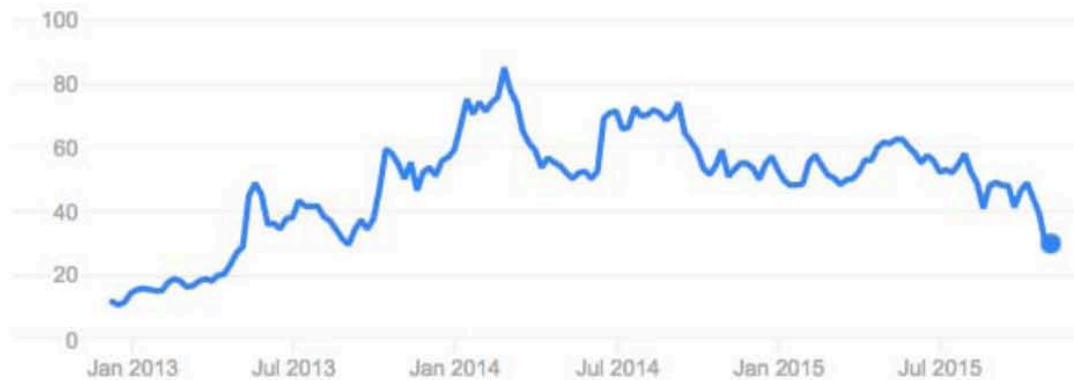


SolarCity Corp

NASDAQ: SCTY - Nov 5 12:45 PM EST

29.65 +0.15 (0.51%)

1 day 5 day 1 month 3 month 1 year 5 year max



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**OPEC's goal - Cripple
U.S. Fracking
Canadian Shale
U.S. oil companies
U.S. Renewables**

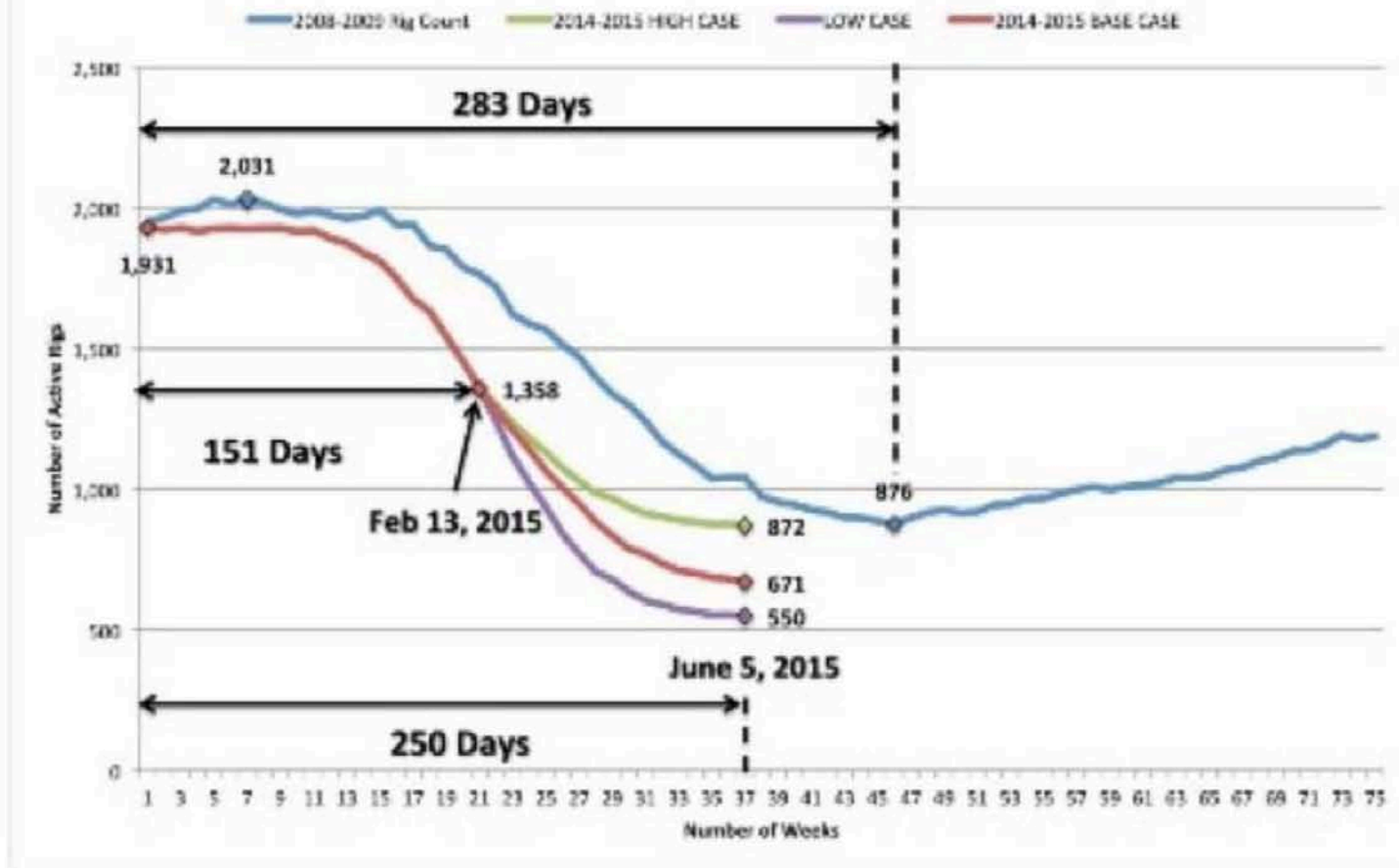
Results:

**Oil Rig Shut Downs
Canadian Oil Pipeline on Hold
Transportation Fuel \$2.75/gal. in
Hawaii
Inflation: <3%**



is a registered trademark of

Comparison of 2008-2009 & 2014-2015 Rig Counts



Comparison of rig count decrease in 2008-2009 and 2014-2015. Source: Baker Hughes

In 2008-2009, the U.S. rig count dropped from 2,031 to 876 over a period of 283 days. As of February 13, 2015, the rig count has fallen from 1,931 to 1,358 over a period of 151 days. The current rate of decrease is greater than in 2008-2009.



Avoided Energy Costs
Hawaiian Electric Company
Mauai Electric Light Company
Maui Electric Company

Jan. 1, 2012 HECO Peak avoided cost: \$26.20

Avoided Energy Cost (> 100 kW)
Schedule "Q" Rates (< or = 100 kW)
 ¢/kWh

Oct. 1, 2015 HECO Peak avoided cost \$10.19

	<u>Hawaiian Electric</u>			<u>Hawai'i Electric</u>			<u>Maui Electric Company</u>								
	<u>Company</u>			<u>Company</u>			<u>Maui Division</u>			<u>Lanai</u>			<u>Molokai</u>		
	On Peak	Off Peak	Sched Q	On Peak	Off Peak	Sched Q	On Peak	Off Peak	Sched Q	On Peak	Off Peak	Sched Q	On Peak	Off Peak	Sched Q
10/1/2015	10.193	9.813	9.57	10.220	9.457	9.59	11.883	10.378	10.81	20.083	17.074	18.07	13.191	15.187	15.12
9/1/2015	12.434	11.797	11.89	10.895	10.010	10.21	13.139	11.524	12.01	21.872	18.551	19.72	19.824	18.334	18.53
8/1/2015	13.116	12.534	12.38	11.449	10.517	10.74	13.866	12.216	12.71	24.043	20.341	21.73	19.888	18.389	18.58
7/1/2015	12.306	11.900	11.65	11.484	10.501	10.75	14.181	12.496	13.01	25.295	21.374	22.87	19.671	18.202	18.39
6/1/2015	11.110	10.856	10.53	11.017	10.074	10.31	12.838	11.256	11.73	23.740	20.091	21.44	18.510	17.196	17.29
5/1/2015	10.193	9.977	9.64	11.259	10.310	10.55	12.720	11.140	11.61	22.013	18.667	19.85	19.174	17.771	17.92
4/1/2015	10.641	10.324	10.04	11.536	10.453	10.77	12.549	10.967	11.44	24.696	20.879	22.33	20.063	18.541	18.75
3/1/2015	10.576	10.345	10.01	11.571	10.706	10.89	11.972	10.434	10.89	23.375	19.790	21.11	20.111	18.583	18.79
2/1/2015	12.369	11.777	11.64	11.830	11.197	11.24	14.719	12.953	13.52	25.200	21.296	22.79	22.577	20.718	21.11
1/1/2015	15.016	14.272	14.20	13.562	12.572	12.81	17.761	15.652	16.38	28.470	23.993	25.81	24.885	22.718	23.28
12/1/2014	15.758	12.078	13.79	16.157	13.912	14.86	19.328	17.019	17.85	29.486	24.825	26.75	26.168	23.815	24.48
11/1/2014	17.126	13.032	14.97	17.791	15.117	16.30	20.224	17.809	18.70	31.323	26.341	28.44	27.461	24.936	25.70
10/1/2014	18.831	14.203	16.44	18.501	15.636	16.93	20.631	18.168	19.08	28.561	24.063	25.89	27.325	24.818	25.57
9/1/2014	19.773	14.789	17.23	18.820	15.910	17.23	20.936	18.508	19.40	32.361	27.197	29.40	23.035	21.102	21.54
8/1/2014	19.736	14.953	17.28	19.797	16.566	18.07	21.059	18.598	19.51	32.629	27.418	29.64	29.913	27.060	28.00
7/1/2014	19.701	15.143	17.33	19.832	16.581	18.09	21.120	18.634	19.56	32.676	27.456	29.69	29.661	26.841	27.76
6/1/2014	19.843	15.062	17.38	19.229	16.245	17.61	20.977	18.418	19.38	32.615	27.407	29.64	29.314	26.540	27.43
5/1/2014	19.825	14.940	17.32	19.069	16.093	17.44	20.936	18.275	19.30	32.823	27.578	29.83	29.245	26.481	27.37
4/1/2014	19.595	15.062	17.24	19.637	16.429	17.91	21.038	18.401	19.41	34.077	28.613	30.98	29.583	26.774	27.69
3/1/2014	19.612	15.021	17.23	19.335	16.230	17.66	20.977	18.275	19.32	33.540	28.169	30.48	29.641	26.824	27.74
2/1/2014	19.488	15.143	17.20	19.353	16.292	17.69	21.120	18.454	19.11	33.752	28.344	30.29	29.593	26.783	26.96
1/1/2014	19.897	15.539	17.61	19.389	16.215	17.68	20.753	18.078	19.11	33.329	27.996	30.29	28.811	26.105	26.96
12/1/2013	23.319	16.356	19.89	20.825	15.638	18.28	19.579	18.920	18.83	34.430	28.880	31.37	29.693	26.836	27.83
11/1/2013	23.457	16.456	20.01	20.751	15.680	18.25	20.281	19.600	19.52	34.983	29.336	31.88	30.464	27.504	28.55
10/1/2013	22.697	16.041	19.40	20.657	15.652	18.19	19.990	19.318	19.23	34.669	29.076	31.59	29.473	26.646	27.63
9/1/2013	21.112	15.262	18.16	19.181	14.455	16.84	19.284	18.638	18.54	34.704	29.106	31.62	29.299	26.495	27.46
8/1/2013	23.089	16.191	19.69	18.976	14.427	16.70	18.911	18.273	18.18	33.272	27.924	30.30	29.307	26.502	27.47
7/1/2013	22.261	16.008	19.14	18.528	14.160	16.33	18.689	18.059	17.96	33.242	27.900	30.27	28.305	25.634	26.53
6/1/2013	22.491	16.008	19.27	19.032	14.372	16.71	19.431	18.777	18.69	33.681	28.262	30.68	29.729	26.868	27.86
5/1/2013	22.882	16.273	19.61	20.171	15.202	17.72	20.056	19.383	19.30	34.187	28.679	31.15	30.627	27.646	28.71
4/1/2013	22.927	16.456	19.70	21.442	15.990	18.78	20.884	20.184	20.11	36.071	30.233	32.88	31.544	28.440	29.57
3/1/2013	22.261	16.340	19.27	20.265	15.286	17.81	19.780	19.115	19.03	35.719	29.943	32.56	30.133	27.217	28.24
2/1/2013	22.239	16.273	19.23	19.555	14.780	17.19	19.524	18.868	18.78	31.861	26.760	29.00	25.468	23.176	23.87
1/1/2013	22.537	16.654	19.56	20.563	15.384	18.02	20.390	19.707	19.62	34.467	28.910	31.40	28.866	26.120	27.05
12/1/2012	25.438	18.429	21.96	20.637	15.466	18.09	22.178	21.034	21.20	36.579	30.672	33.19	30.029	27.100	28.11
11/1/2012	26.096	19.049	22.60	21.176	15.888	18.58	22.467	21.306	21.48	36.964	30.990	33.54	29.379	26.538	27.50
10/1/2012	26.197	19.256	22.74	20.018	15.074	17.57	20.018	18.982	19.11	33.423	28.068	30.27	27.722	25.103	25.95
9/1/2012	26.197	19.218	22.73	19.057	14.411	16.74	18.758	17.791	17.89	31.756	26.693	28.74	26.435	23.988	24.74
8/1/2012	27.260	19.801	23.58	19.077	14.350	16.73	19.713	18.705	18.82	32.500	27.308	29.42	28.287	25.592	26.48
7/1/2012	28.803	20.779	24.88	21.416	15.903	18.72	21.214	20.132	20.28	35.213	29.544	31.92	29.815	26.916	27.91
6/1/2012	28.650	21.023	24.89	22.136	16.206	19.27	22.051	20.928	21.09	36.152	30.319	32.79	30.750	27.725	28.79
5/1/2012	28.271	21.004	24.67	21.036	15.663	18.40	22.331	21.192	21.36	37.241	31.218	33.80	30.787	27.758	28.82
4/1/2012	27.436	20.534	23.99	21.097	15.723	18.47	20.859	19.794	19.93	35.333	29.644	32.03	29.098	26.296	27.24
3/1/2012	26.349	19.971	23.13	20.397	15.225	17.85	20.380	19.337	19.47	34.171	28.685	30.97	28.499	25.776	26.68
2/1/2012	26.045	19.481	22.75	20.257	15.149	17.74	19.940	18.916	19.04	34.467	28.930	31.24	28.195	25.513	26.39
1/1/2012	26.197	19.237	22.74	21.656	17.656	19.57	20.240	19.194	19.32	34.621	29.057	31.38	29.428	26.580	27.55



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**PLUG AND PLAY
ENERGY SYSTEMS LLC**

Aug. 2014 to Sept. 2015
Oahu Residential rate: \$0.35 down to \$0.33
-6%

HAWAIIAN ELECTRIC COMPANY, INC.

SUPERCEDES EFFECTIVE RATES: 8/1/2014
 BASE RATES EFFECTIVE: September 1, 2012

	BASE RATES (\$)	09/01/14 EFFECTIVE RATES (\$)¹
SCHEDULE 'R' -- RESIDENTIAL		
Customer charge, per customer per month		
Single phase service	9.00	9.00
Three phase service	18.00	18.00
Energy charge (added to customer charge) - per kWh		
First 350 kWh per month -	0.217096	0.345148 per kWh
Next 850 kWh per month - per kWh	0.228631	0.356683
All kWh over 1,200 kWh per month - per kWh	0.247405	0.375457
Minimum charge, per customer per month	17.00/23.00	17.00/23.00

HAWAIIAN ELECTRIC COMPANY, INC.

SUPERCEDES EFFECTIVE RATES: 9/1/2015
 BASE RATES EFFECTIVE: September 1, 2012

	BASE RATES (\$)	10/01/15 EFFECTIVE RATES (\$)¹
ENERGY COST ADJUSTMENT FACTORS: (EFFECTIVE 10/01/2015 to 10/31/2015)		
All Rate Schedules		(\$0.027930) per kWh
PURCHASE POWER ADJUSTMENT CLAUSE: (EFFECTIVE 10/01/2015 to 10/31/2015)		
Schedules 'R', 'TOU-R', 'TOU-EV', 'EV-R'		\$0.033971 per kWh
Schedules 'G', 'TOU-G', 'EV-C'		\$0.027521 per kWh
Schedules 'J', 'TOU-J', 'SS'		\$0.026232 per kWh
Schedules 'DS'		\$0.021256 per kWh
Schedules 'P', 'U'		\$0.023069 per kWh
Schedules 'F'		\$0.033759 per kWh



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**PLUG AND PLAY
ENERGY SYSTEMS LLC**

Aug. 2014 to Sept. 2015
Molokai Residential rate: \$0.37 down to \$0.30
-19%

MAUI ELECTRIC CO., LIMITED
 MOLOKAI DIVISION

SUPERCEDES EFFECTIVE RATES: August 1, 2014
 BASE RATES EFFECTIVE: August 1, 2013

	<u>BASE RATES (\$)</u>	<u>09/01/14 EFFECTIVE RATES (\$)¹</u>
SCHEDULE 'R' -- RESIDENTIAL		
Customer charge, per customer per month		
Single phase service	8.50	8.50
Three phase service	13.00	13.00
Energy charge (added to customer charge)		
First 250 kWhr per month - per kWhr	0.377746	0.375792 per kWhr
Next 500 kWhr per month - per kWhr	0.404246	0.402292 per kWhr
All kWhr over 750 kWhr per month - per kWhr	0.415746	0.413792 per kWhr
Minimum charge, per customer per month - single phase	18.00	18.00
Minimum charge, per customer per month - three phase	22.50	22.50

MOLOKAI DIVISION

SUPERCEDES EFFECTIVE RATES: 9/1/2015
 BASE RATES EFFECTIVE: August 1, 2013

	<u>BASE RATES (\$)</u>	<u>10/01/15 EFFECTIVE RATES (\$)¹</u>
SCHEDULE 'R' -- RESIDENTIAL		
Customer charge, per customer per month		
Single phase service	8.50	8.50
Three phase service	13.00	13.00
Energy charge (added to customer charge)		
First 250 kWhr per month - per kWhr	0.377746	0.299625 per kWhr
Next 500 kWhr per month - per kWhr	0.404246	0.326125 per kWhr
All kWhr over 750 kWhr per month - per kWhr	0.415746	0.337625 per kWhr
Minimum charge, per customer per month - single phase	18.00	18.00
Minimum charge, per customer per month - three phase	22.50	22.50
Green Infrastructure Fee, per customer, per month - Add to all bills	1.42	1.42 per mth

RULE No. 14 (Continued)

Service Connections and Facilities on Customer's Premises

H. INTERCONNECTION OF DISTRIBUTED GENERATING FACILITIES WITH
THE COMPANY'S DISTRIBUTION SYSTEM

1. Interconnection Standards

- a. Distributed generating facilities interconnected to the Company's electric system shall satisfy the Company's Interconnection Standards.
- b. The Company's Interconnection Standards are included as Appendix I to Rule 14.

2. Definitions

For purposes of this Rule 14H, the following definitions shall apply:

- a. "Distributed Generation Facility": A Generating Facility located on a Customer's premises that is interconnected with the Distribution System.
- b. "Distribution System": All electrical wires, equipment and other facilities at the distribution voltage levels (such as 25kV-HECO only, 12kV, 4kV or 2.4kV) owned or provided by the utility, through which the utility provides electrical service to its customers.
- c. "Generating Facility": Customer or utility-owned electrical power generation that is interconnected to the utility.
- d. "Interconnect" or "interconnected" or "interconnection": The physical connection of any Distributed Generating Facility to the Distribution System, including the facilities required to provide the electric distribution service to a Customer, using electrical wires, switches, and related equipment located on either side of the point of common coupling as appropriate to their purpose and design to allow the physical connection of a Distributed Generating Facility to the Distribution System.

HAWAIIAN ELECTRIC COMPANY, INC.

HEI Rule 14, Effective October 21, 2015

Interconnection of Distributed Generating Facilities (DERs or Mini Grids) with the Companies (HEI) Distribution System

Avoided Energy Costs
Hawaiian Electric Company
Hawaii Electric Light Company
Maui Electric Company



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ENERGY SYSTEMS LLC**

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Avoided Energy Cost (> 100 kW)
Schedule "Q" Rates (< or = 100 kW)
 ¢/kWh

	<u>Hawaiian Electric</u>			<u>Hawai'i Electric</u>			<u>Maui Electric Company</u>								
	<u>Company</u>			<u>Company</u>			<u>Maui Division</u>			<u>Lanai</u>			<u>Molokai</u>		
	<u>On Peak</u>	<u>Off Peak</u>	<u>Sched Q</u>	<u>On Peak</u>	<u>Off Peak</u>	<u>Sched Q</u>	<u>On Peak</u>	<u>Off Peak</u>	<u>Sched Q</u>	<u>On Peak</u>	<u>Off Peak</u>	<u>Sched Q</u>	<u>On Peak</u>	<u>Off Peak</u>	<u>Sched Q</u>
10/1/2015	10.193	9.813	9.57	10.220	9.457	9.59	11.883	10.378	10.81	20.083	17.074	18.07	13.191	15.187	15.12
9/1/2015	12.434	11.797	11.69	10.895	10.010	10.21	13.139	11.524	12.01	21.872	18.551	19.72	19.824	18.334	18.53
8/1/2015	13.116	12.534	12.38	11.449	10.517	10.74	13.866	12.218	12.71	24.043	20.341	21.73	19.888	18.389	18.58
7/1/2015	12.306	11.900	11.65	11.484	10.501	10.75	14.181	12.496	13.01	25.295	21.374	22.87	19.671	18.202	18.39
6/1/2015	11.110	10.856	10.53	11.017	10.074	10.31	12.838	11.258	11.73	23.740	20.091	21.44	18.510	17.196	17.29
5/1/2015	10.193	9.977	9.84	11.259	10.310	10.55	12.720	11.140	11.61	22.013	18.667	19.85	19.174	17.771	17.92
4/1/2015	10.641	10.324	10.04	11.536	10.453	10.77	12.549	10.967	11.44	24.696	20.879	22.33	20.063	18.541	18.75

HEI Avoided "Q" rate Oct. 2015

PUC HEI storage rate 2015

Difference

\$9.57	Oahu	15.07 cents per kWh	\$5.50	36%
\$9.59	Hawaii	15.14 cents per kWh	\$5.55	37%
\$10.81	Maui	17.16 cents per kWh	\$6.35	37%
\$15.12	Molokai	24.07 cents per kWh	\$8.95	37%
\$18.01	Lanai	27.88 cents per kWh	\$9.87	35%



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ENERGY USAGE

● OAHU 4:24 PM

TOTAL ENERGY MIX

LAST 24 HOURS

Battery Storage: 1,200MW

Renewable Stabilization

Load Leveling

Voltage and Frequency Regulation

Demand Response Control

WE ARE USING

890

MEGAWATTS RIGHT NOW

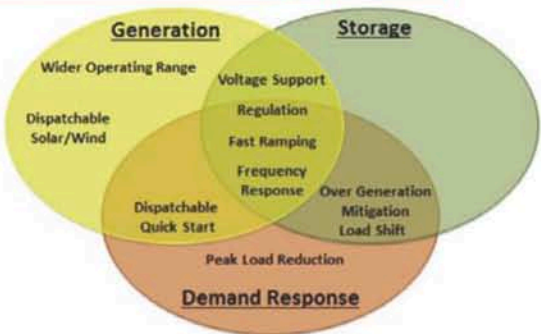
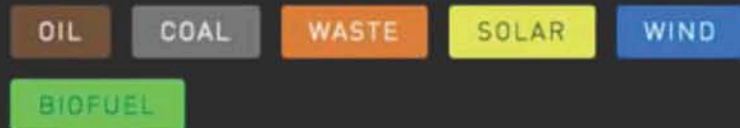
WEEKLY PROGRESS

	LOW	HIGH
SUN	562	946
MON	559	1,013
TUE	573	1,029
	596	1,052
	593	1,057
	589	1,032
WEEKLY	613	898



MED

LOW





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ENERGY SYSTEMS LLC



Wind is not reliable

Trade Wind Decrease

As trade winds decrease, the efficiency of Wind Power **DECREASES**

Click on JPG below to view article

Trade winds drop, and Hawaii gets muggy

AP By **AUDREY McAVOY**
June 3, 2013 10:27 PM

"The resulting study, published last fall in the Journal of Geophysical Research, showed a decades-long decline, including a **28 percent drop in northeast trade wind days** at Honolulu's airport since the early 1970s.... For now, Chu said the most important consequence will be **declining rainfall and a drop in the water supply**, particularly as Hawaii's population grows and uses more water.... The drop in trade winds, along with a separate decline in winter Kona storms, is one reason parts of Hawaii **are in drought. Maui, for example, just had the driest April on record.**"

HONOLULU (AP) — Part of what makes living in Hawaii so pleasant is the gentle breeze. Arriving from the northeast, it's light enough that it is barely noticeable but strong enough to chase away the humidity.



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January 7, 2016



Wind produces energy less than 200 days per year



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Distributed Energy Resources (DER)

PlugandPlayEnergySystems.com

Monets001@hawaii.rr.com



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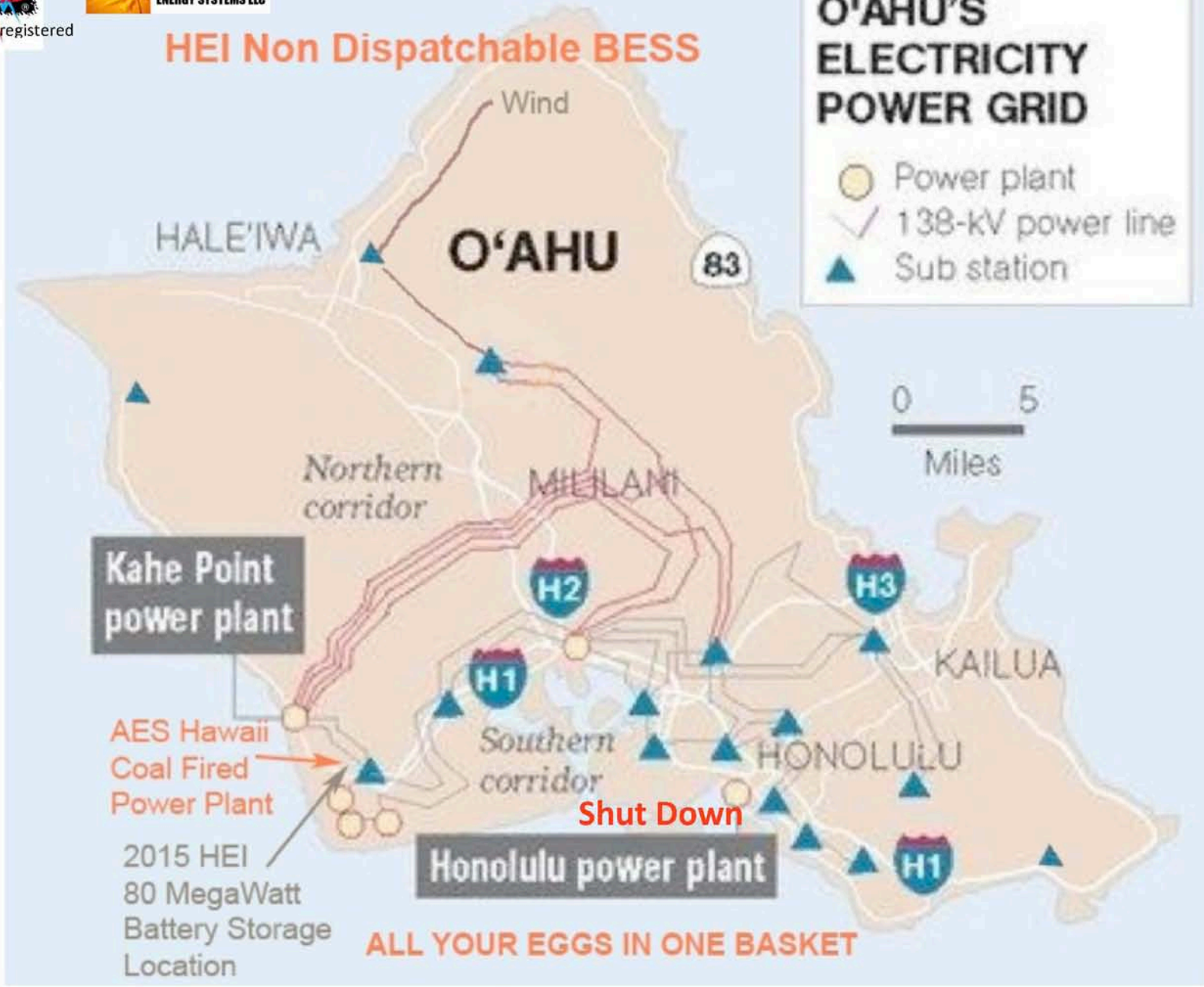


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HEI Non Dispatchable BESS

O'AHU'S ELECTRICITY POWER GRID

- Power plant
- ✓ 138-kV power line
- ▲ Sub station



**Kahe Point
power plant**

AES Hawaii
Coal Fired
Power Plant

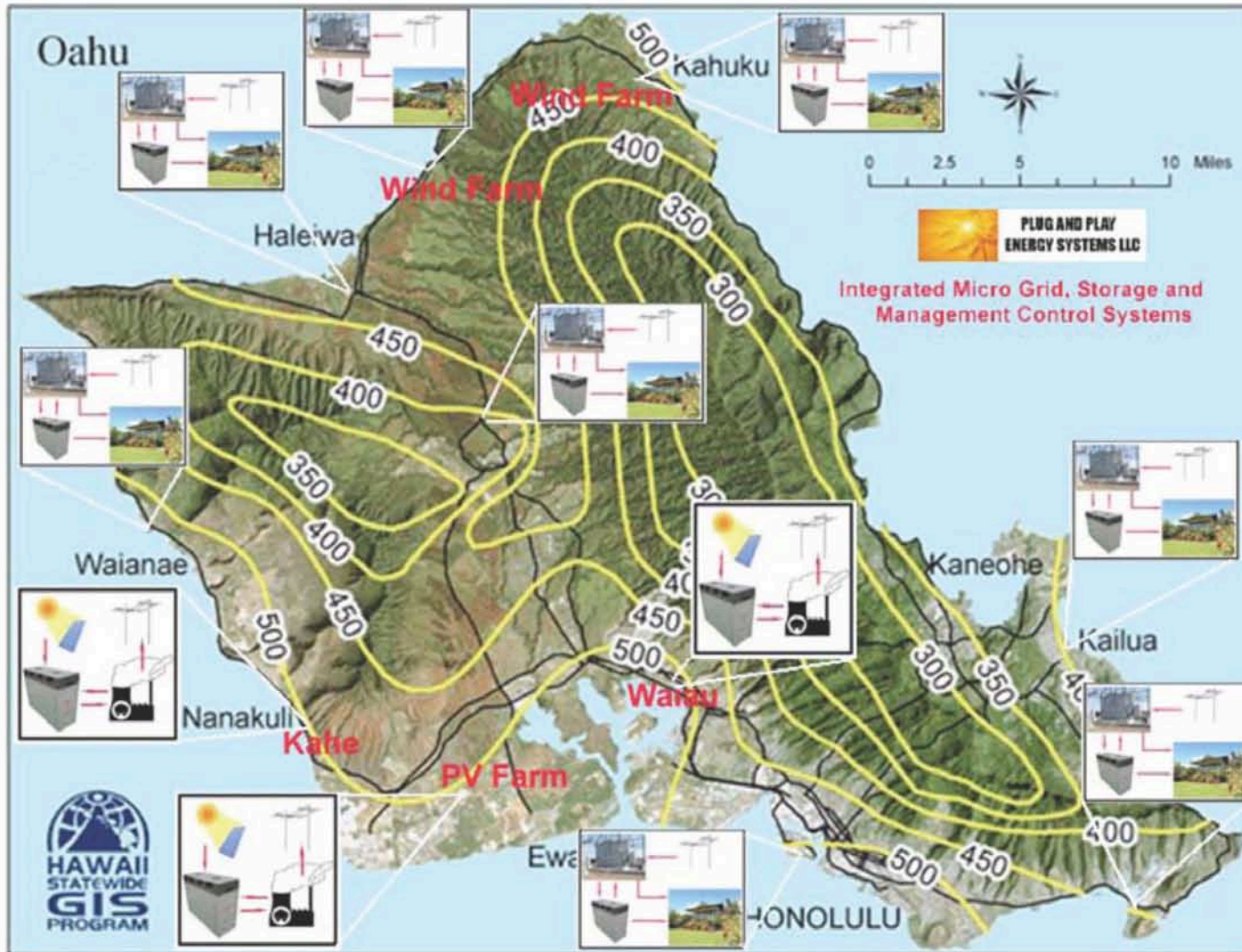
2015 HEI
80 MegaWatt
Battery Storage
Location

Honolulu power plant



PPES Oahu-Distributed Energy Resources (DER)

Small-scale power generation or storage technologies (typically up to 10 megawatts), sometimes coupled with MicroGrids





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PV/Wind Array



**Bi-directional
Control**

**PPES Wireless
Utility Cloud**



Cellphone

**Bi-directional
Control**



UTILITY SCADA

Cellphone



**Linemen
Service Crews**



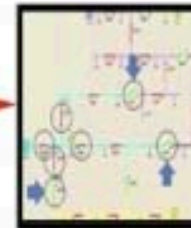
PPES Battery Storage (BESS)



Sub Station



**Bi-directional
Control**



PPES Smart Meter & Smart Grid

Power Flow

PowerLord Distributed Energy Resource (DER)



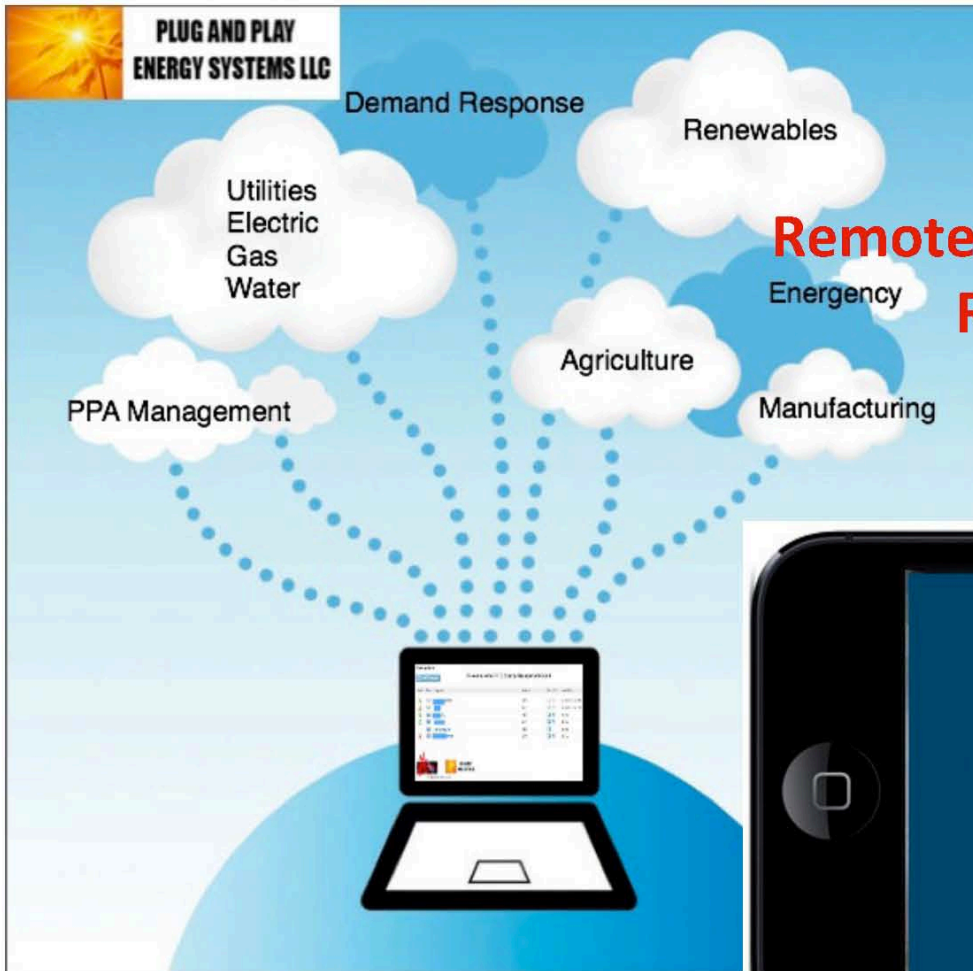
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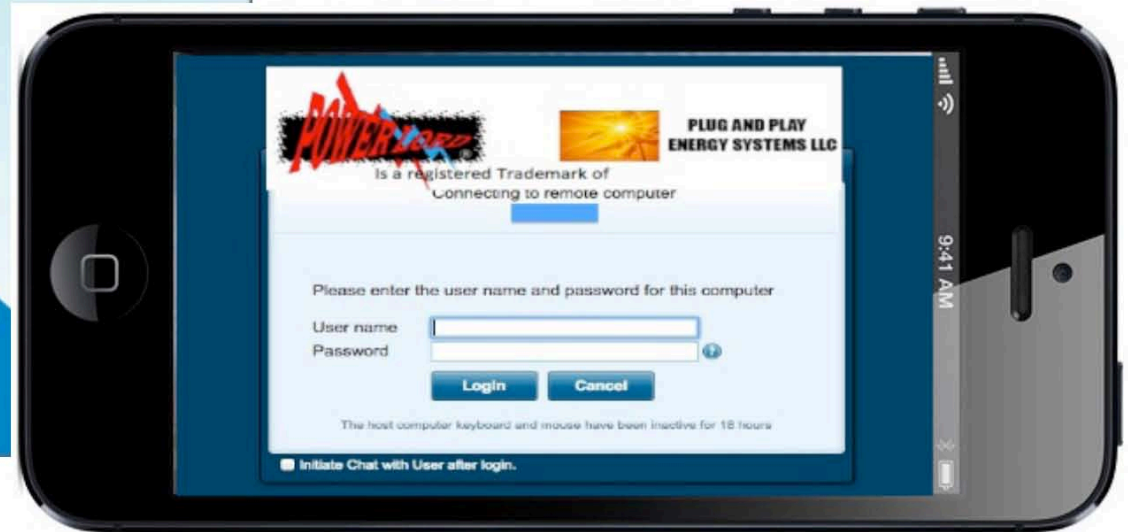
**PLUG AND PLAY
ENERGY SYSTEMS LLC**

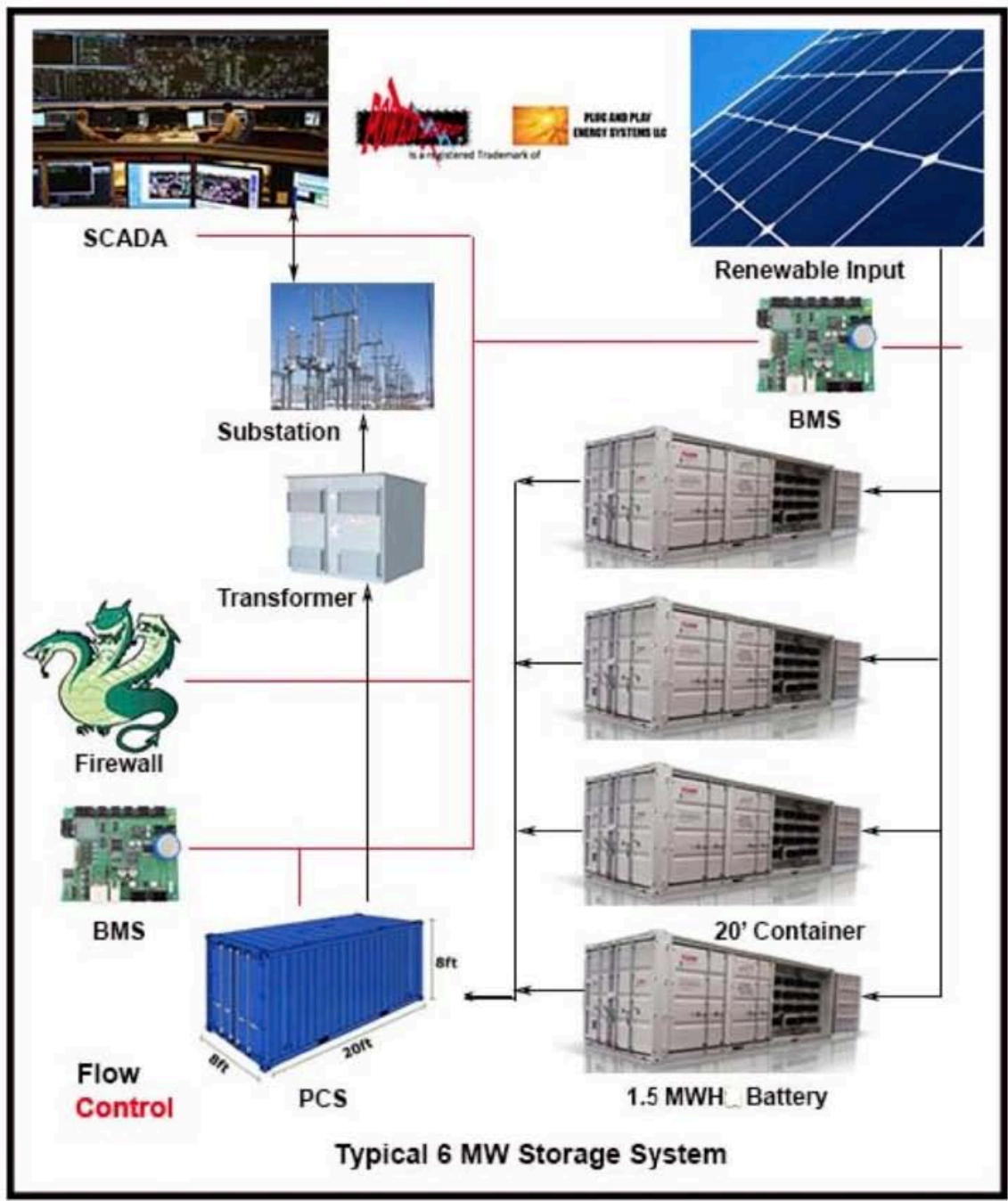
[Contact](#)

SMART GRID MANAGEMENT SOFTWARE Distributed Storage



Remote SCADA & Substation Integration
Remote PPA Management
Cyber Secure





Typical 6 MW Storage System



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Toucan Storage Plant



UNIT: 4,5 Energy Spring 164
(288 ST523 620V 23,5kWh)

ENERGY: 4,5 MWh

POWER: 1,5 MW

- Photovoltaic integration
- PV system regulation
- Maximization of the PV output capacity

Voltage and Frequency Regulation





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T&D – Micro-Grid System for a Luxury Resort



Location: Maldives Islands



- Micro-Grid
- Photovoltaic integration
- Gen-set for back-up



Luxury Resort

UNIT: 1 Energy Spring (64 ST523 620V
23,5kWh)

ENERGY: 1.2 MWh (400 KW x 3h)

POWER: 400 KW





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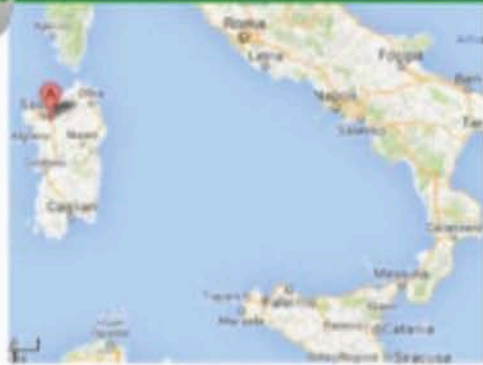


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TERNA - Grid Services (Storage LAB)



Location: Codrongianos
- Sardinia



UNIT: 4 Energy Spring 164 (256 ST523
620V 23,5kWh)

ENERGY: 4,15 MWh

POWER: 1,2 MW

- Grid Balancing
- Maximization of the power capacity transport of the Power Grid
- HV line Voltage Regulation



Remote Places, Harsh Conditions



is a registered trademark of

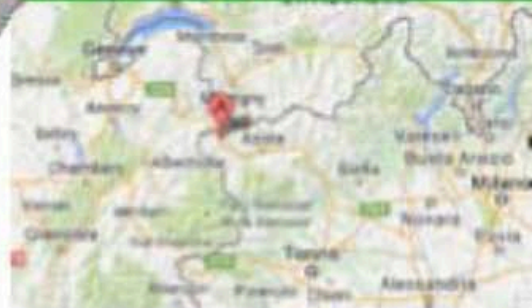


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CAI TORINO - Bivacco Gervasutti



Location: Courmayeur, 2835 m.
Fréboudze glacier



ENERGY
STORAGE

UNIT: 1 48TL80 (48V 3,9kWh)
ENERGY: 4 KWh
POWER: 3 KW

- Off-Grid Application
- Photovoltaic panels on the roof
- self-diagnosis system and environmental data detection



PlugandPlayEnergySystems.com

The Gervasutti bivouac is located at 2835 m, atop a rocky region in the upper Fréboudze Glacier on Mount Blanc. After 3 years, "Luca Necchi, maintenance manager, confirmed **"the good functioning of our photovoltaic plant and its charge controllers."**



**PLUG AND PLAY
ENERGY SYSTEMS LLC**



Plug and Play (PPES) v Lithium Ion Battery Safety

PlugandPlayEnergySystems.com

Monets001@hawaii.rr.com



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Independent Battery Abuse Tests of a Fully Charged, Operating PPES Battery

PPES - 1.4MWh BATTERIES CAN SAFELY BE INSTALLED IN RESIDENTIAL AREAS

1. **Complete submersion in salt water**, no fire was created and no explosions occurred
2. **Fire exposure and water hose down**, battery did not cause an escalation of the fire and self-extinguished once the petroleum was extinguished.
3. **Bullet impacts by various types of munitions**, No uncontrolled fire or explosion resulted from any of the munitions fire impacts
4. **High-speed impact in both as-installed and as-shipped conditions**, (30 mph) impacts with a stationary section of a telephone pole, no fire or explosions occur, and no additional unsafe conditions are created.
5. **Overcharge by over voltage**, Battery continued to operate normally up to and including 145% of the nominal voltage
6. **Short circuit testing**, continue to operate after the short circuit event
7. **Deep penetration into the case of the battery followed by water exposure**, reaction was largely steam vapor, mixed with small quantities of smoke from the flame and cell-air-water reaction produced
8. **Accidental drop scenarios while in the as-installed condition**, Battery was dropped from a height of 2.1 meters (82 inches) onto the face of the Battery Management System resulted in no fire or explosion of parts



All Panasonic, Sanyo, Samsung, A123, Mitsubishi, LG Chem, NEC, Kokam, Sanyo and Sony Battery Storage Systems use Lithium iron Phosphate (LFP) #18650 battery cells

which are manufactured by them under license subject to U.S. Patent Number [7.338.734](#) granted on March 4, 2008, titled "Conductive Lithium Storage Electrode" (Chiang, Chung, Bloking, & Andersson, 2002). In 2010 Panasonic bought Sanyo.

Panasonic 3.7 Volt 3100 mAh Li-Ion 18650 Rechargeable Battery



Specifications:

- Nominal Voltage: 3.7V
- Size: 18650 (Cylindrical)
- Capacity: 3100 mAh
- Chemistry: Lithium Ion (Rechargeable Li-Ion)
- Brand: Panasonic
- MFG Part #: NCR18650A
- Max Charging current: 1.5A
- Max Discharging current: 4A
- Flat on Both Ends
- Included Qty: 1

Dimensions:

- Length: 65 mm (2.56")
- Diameter: 18 mm (0.71")
- Weight: 45.5 g (1.6 Oz)

8650 3.6v Samsung 1500 mAh (15M) li-on Battery (Ideal or Drill Packs (5.55Wh, 23A Rate))



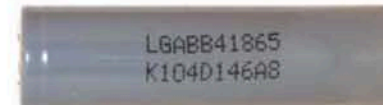
Specifications:

- Nominal Voltage: 3.7V working, 3.6V Average
- Charging Voltage: 4.2
- Discharge Cutoff Voltage: 2.5V
- Size: 18650 (Cylindrical)
- Nominal Capacity: 1500mAh (300mA, 2.5V discharge)
- Chemistry: Lithium Ion (Rechargeable Li-Ion)
- Max Discharging current: 23A(ambient temperature 25C)
- Brand: Samsung
- Included Qty: 1

Dimensions:

- Length: 65 mm
- Diameter: 18 mm
- Weight: 48 g (1.69 Oz)

LG 3.7 Volt 2600 mAh Li-Ion 18650 Rechargeable Battery



Specifications:

- Nominal Voltage: 3.7V
- Size: 18650 (Cylindrical)
- Capacity: 2600 mAh
- Chemistry: Lithium Ion (Rechargeable Li-Ion)
- Brand: LG
- Max Charging current: 2.4A
- Max Discharging current: 5A
- Flat on Both Ends
- Included Qty: 1

Dimensions:

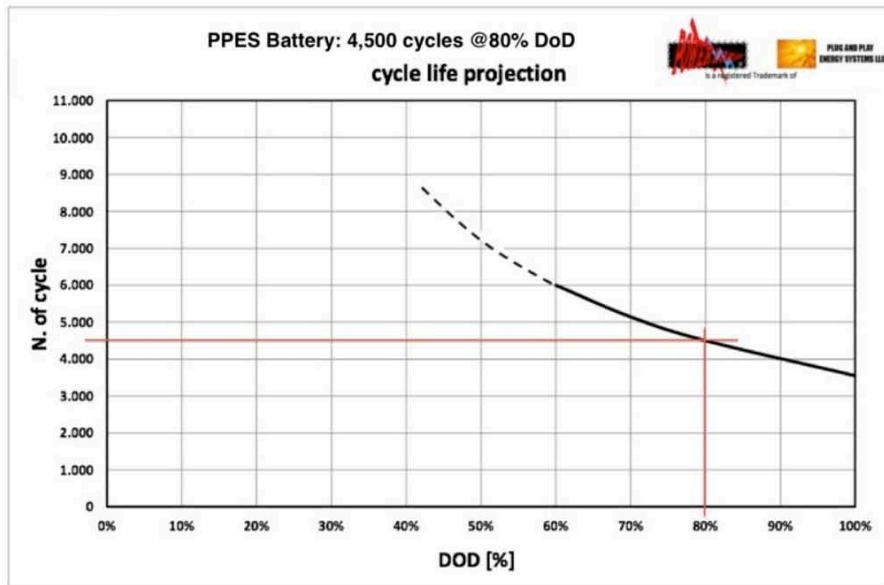
- Length: 65 mm (2.56")
- Diameter: 18 mm (0.71")
- Weight: 46.5 g (1.64 Oz)



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ENERGY SYSTEMS LLC

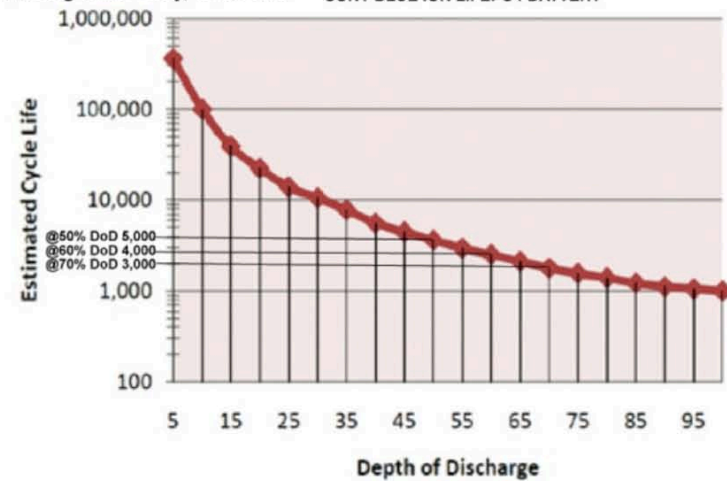
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PPES - 4,500 cycles @ 80% DoD



LIFPO4 - 1,800 cycles @ 80% DoD

Source: Aalborg University, Denmark SONY BLUE ION LIFEPO4 BATTERY



Relationship of battery cycle life as a function of
Depth of Discharge for the considered LifePo4 battery



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ENERGY SYSTEMS LLC

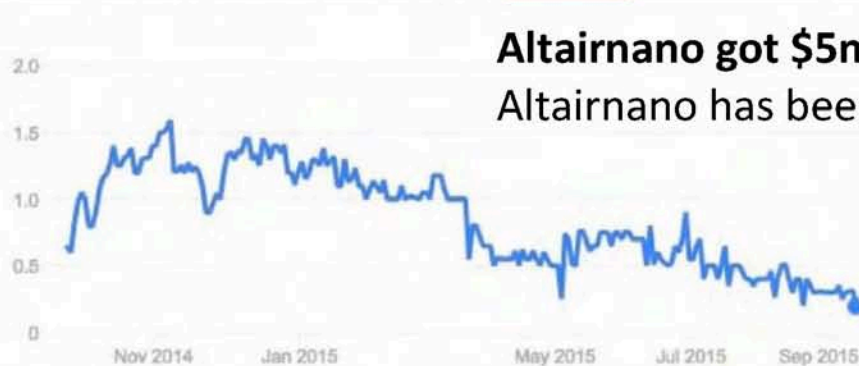
Altairnano stock lost 97% of its value in 2015

Altair Nanotech

OTCMKTS: ALTI - Sep 29 11:03 AM EDT

0.20 +0.11 (35.48%)

1 day 5 day 1 month 3 month 1 year 5 year max



Altairnano got \$5million from HEI and State of Hawaii

Altairnano has been sued by investors for fraud and misrepresentation

Open	0.20	Mkt cap	-
High	0.20	P/E ratio	-
Low	0.20	Div yield	-

In 2013, Hawaiian Electric HEI, Hawaii Natural Energy Institute (HNEI) and Office of Navy Research (ONR) paid AltairNano \$5 million in 'seed' money to test 3, unsafe, combustible Lithium Titrates batteries in Hawaii. Despite the fact that HNEI's director is a chemical engineer with an impressive resume, he failed to question **absurd representations by Altairnano including but not limited to "20,000 cycles at 90%DOD and over 1 million cycles at 20%DOD"**. That would have been a red flag for a high school chemistry student.

Google Finance - Yahoo Finance - MSN Money

**Altairnano claim:
20,000 cycles at 90%
DoD, is this possible
with the LGChem
#18650 Battery?**

Altairnano is under contract with HEI to build a 1MWh Battery Storage System using the LGChem #18650 LFP battery cell in Kalaeloa, Oahu Hawaii. **Kalaeloa is in a Hurricane and global warming flood zone.**

Lithium cells can go into **thermal runaway** and combust if submerged or otherwise come in contact with water.



Altairnano, AEC, Panasonic (STEM) BESS

“to Minimize thermal runaway and fire hazard Locate BESS away from public”

BESS Fire and Smoke – Risk and Mitigation

- Fire
 - Physical separation of BESS trailer and PCS enclosure
 - Fully-tested fire suppression – CO₂ (BESS) and FM200 (PCS)
 - Altairnano completed fire & abuse testing with Navy
 - Battery chemistry and operation minimizes thermal runaway and fire hazard
- Smoke
 - Enclosure can provide containment
 - Locate BESS away from public
- Operations experience
 - HELCO Hawi BESS project
 - Exploring testing of BESS at Sandia prior to putting into service



Hawaiian Electric
Maui Electric
Hawaii Electric Light

Classification: Legal - Internal

Date Modified 4/9/2015

Slide 49



Safety Precautions

Lithium Battery

Do not expose the battery to water or allow the battery to get wet.

Do not penetrate with nails, or strong impacts.

Misusing the battery may cause the battery to get hot, explode or ignite and cause serious injury.

1. When Using the Battery

DANGER

- (1) **Misusing the battery may cause the battery to get hot, explode, or ignite and cause serious injury.** Be sure to follow the safety rules listed below:
 - **Do not place the battery in fire or heat the battery.**
 - Do not install the battery backwards so that the polarity is reversed.
 - Do not connect the positive terminal and the negative terminal of the battery to each other with any metal object (such as wire).
 - Do not carry or store the batteries together with necklaces, hairpins, or other metal objects.
 - **Do not penetrate the battery with nails, strike the battery with a hammer, step on the battery, or otherwise subject it to strong impacts or shocks.**
 - Do not solder directly onto the battery.
 - **Do not expose the battery to water or salt water, or allow the battery to get wet.**
- (2) **Do not disassemble or modify the battery.** The battery contains safety and protection devices which, if damaged, may cause the battery to generate heat, explode or ignite.
- (3) Do not place the battery on or near fires, stoves, or other high-temperature locations. **Do not place the battery in direct sunshine, or use or store the battery inside cars in hot weather.** Doing so may cause the battery to generate heat, explode, or ignite. Using the battery in this manner may also result in a loss of performance and a shortened life expectancy.
- (4) **Do not insert the battery into equipment designed to be hermetically sealed.** In some cases hydrogen or oxygen may be discharged from the cell which may result in rupture, fire or explosion.

WARNING

- (1) **Immediately discontinue use of the battery if, while using, charging, or storing the battery, the battery emits an unusual smell, feels hot, changes color, changes shape, or appears abnormal in any other way.** Contact your sales location or Panasonic if any of these problems are observed.
- (2) Do not place the batteries in microwave ovens, high-pressure containers, or on induction cookware.
- (3) In the event that the battery leaks and the fluid gets into one's eye, do not rub the eye. Rinse well with water and immediately seek medical care. If left untreated the battery fluid could cause damage to the eye.



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Public Safety

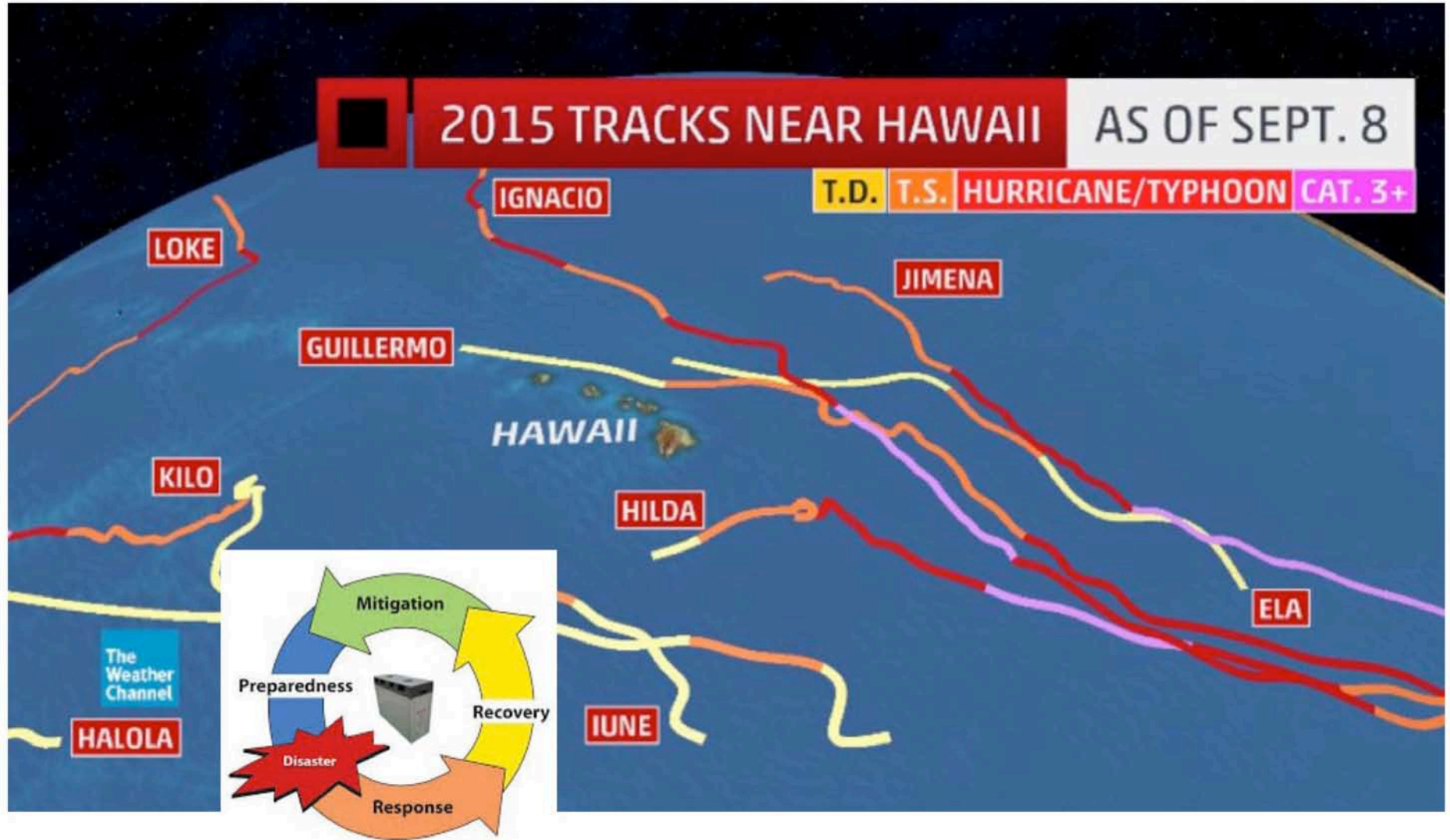
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A Matter of Public Safety

Summer 2015: 50 Record Breaking Heat days





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Global Warming & Climate Change in Hawaii are expected to cause or intensify:

- **Sea level rise**
- **Shoreline erosion & poor lowland drainage**
- **Saltwater intrusion into groundwater**
- **Ocean acidification and reef breakdown**
- **More frequent and severe storms**
- **Drought**
- **Sea surface temperature rise**





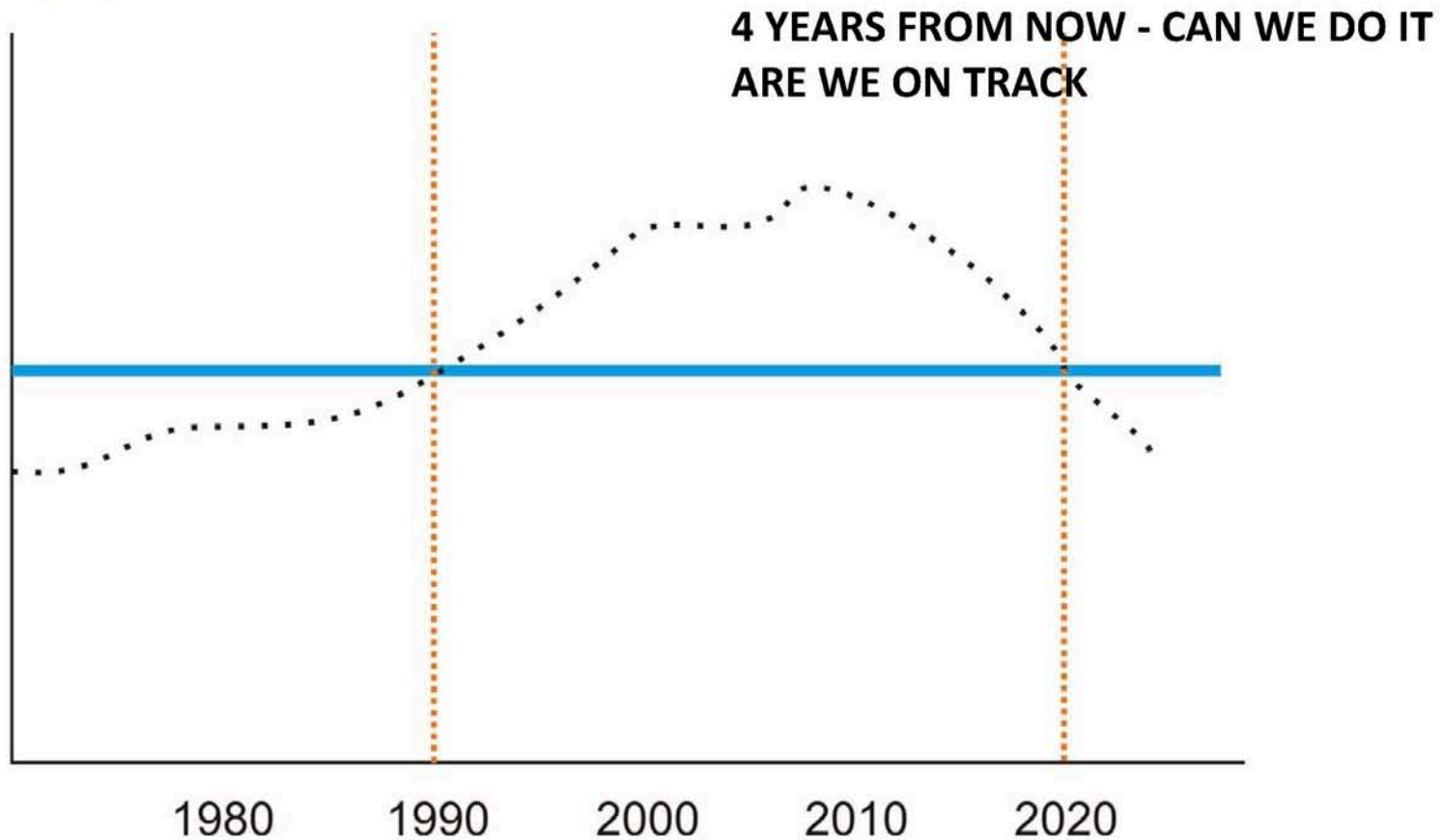
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ACT 234 (2007) Global Warming Solutions Act

Establish and cost-effectively set policy to reduce emissions of greenhouse gases (GHG), to the best estimate of 1990 levels, by January 1, 2020.





PLUG AND PLAY ENERGY SYSTEMS LLC GHG Emission Reduction Plan Log

4 YEARS FROM NOW - CAN WE DO IT ARE WE ON TRACK

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Permit No.	Facility Name	Location	GHG Reduction Proposal
0067-01-C	Maui Electric Company, Ltd.	Maalaea, Maui	16% cap among eleven HECO/HELCO/MECO facilities
0067-02-C	Maalaea Generating Station		(partnering and 2010 baseline year to establish cap)
0007-01-C	Hawaiian Electric Light Company, Inc.	Keahole, Hawaii	16% cap among eleven HECO/HELCO/MECO facilities
0070-01-C	Keahole Generating Station		(partnering and 2010 baseline year to establish cap)
0031-04-C	Maui Electric Company, Ltd.	32A Ulili Street, Kaunakakai, Molokai	16% cap among 11 HECO/HELCO/MECO facilities
	Palaau Generating Station		(partnering and 2010 baseline year to establish cap)
0054-01-C	Hawaii Commercial & Sugar Company	Puunene, Maui	16% cap
	Puunene Mill		(2010 baseline year to establish cap)
0087-02-C	AES Hawaii, Inc.	91-086 Kaomi Loop, Campbell Industrial Park, Oahu	Plan submittal date extended to December 31, 2015
	Coal-Fired Cogeneration Plant		Plan submittal date extended to March 31, 2016
0088-01-C	Chevron Products Company	91-480 Malakole Street, Kapolei, Oahu	2.2% cap
0088-02-C	Hawaii Refinery		(2009 baseline year to establish cap)
0097-01-C	Kauai Island Utility Cooperative	261 Akaula Street, Eleele, Kauai	16% cap among two KIUC facilities
	Port Allen Generating Station		(partnering and 2007 baseline year to establish cap)
0212-01-C	Hawaii Independent Energy	91-325 Komohana Street, Kapolei, Oahu	Plan submittal date extended to September 30, 2015
	Petroleum Refinery		12% cap
			(2007 baseline year to establish cap)
0214-01-C	Kalaheo Partners, L.P.	99-111 Kalaheo Boulevard, Kapolei, Oahu	16% cap
	Kalaheo Cogeneration Plant		(2009 baseline year to establish cap)
0232-01-C	Maui Electric Company, Ltd.	200 Hobron Avenue, Kahului, Maui	16% cap among eleven HECO/HELCO/MECO facilities
	Kahului Generating Station		(partnering and 2010 baseline year to establish cap)
0234-01-C	Hawaiian Electric Light Company, Inc.	Hilo, Hawaii	16% cap among eleven HECO/HELCO/MECO facilities
	Kanoehua Hill Generating Station		(partnering and 2010 baseline year to establish cap)
0235-01-C	Hawaiian Electric Light Company, Inc.	Keaau, Hawaii	16% cap among eleven HECO/HELCO/MECO facilities
	Puna Generating Station		(partnering and 2010 baseline year to establish cap)
0236-01-C	Hawaiian Electric Light Company, Inc.	20 Banyan Drive, Hilo, Hawaii	16% cap among eleven HECO/HELCO/MECO facilities
	Shipman Generating Station		(partnering and 2010 baseline year to establish cap)
0238-01-C	Hawaiian Electric Company	170 Ala Moana Boulevard, Honolulu, Oahu	16% cap among eleven HECO/HELCO/MECO facilities
	Honolulu Generating Station		(partnering and 2010 baseline year to establish cap)
0239-01-C	Hawaiian Electric Company	Pearl City, Oahu	16% cap among eleven HECO/HELCO/MECO facilities
	Waiuu Generating Station		(partnering and 2010 baseline year to establish cap)
0240-01-C	Hawaiian Electric Company	89-900 Farrington Highway, Waianae, Oahu	16% cap among eleven HECO/HELCO/MECO facilities
	Kahe Generating Station		(partnering and 2010 baseline year to establish cap)
0243-01-C	Hamakua Energy Partners, L.P.	Hamakua Sugar Mill, Haina, Hawaii	0-1% below state-wide target
	Hamakua Energy Plant		(deep cleaning heat recovery steam generator)
0452-01-C	Kauai Island Utility Cooperative	4941-K Maalo Road, Lihue, Kauai	16% cap among two KIUC facilities
	Kapaia Power Station		(partnering and 2007 baseline year to establish cap)
0548-01-C	Hawaiian Electric Company	91-196 Hanua Street, Kapolei, Oahu	16% cap among eleven HECO/HELCO/MECO facilities
	Campbell Industrial Park Generating Station		(partnering and 2010 baseline year to establish cap)
0724-01-C	Hu Honua Bioenergy, LLC	28-283 Sugar Mill Road, Pepeekeo, Hawaii	State cap is considered unattainable
	Pepeekeo Power Plant		(using biofuel as best available control technology)



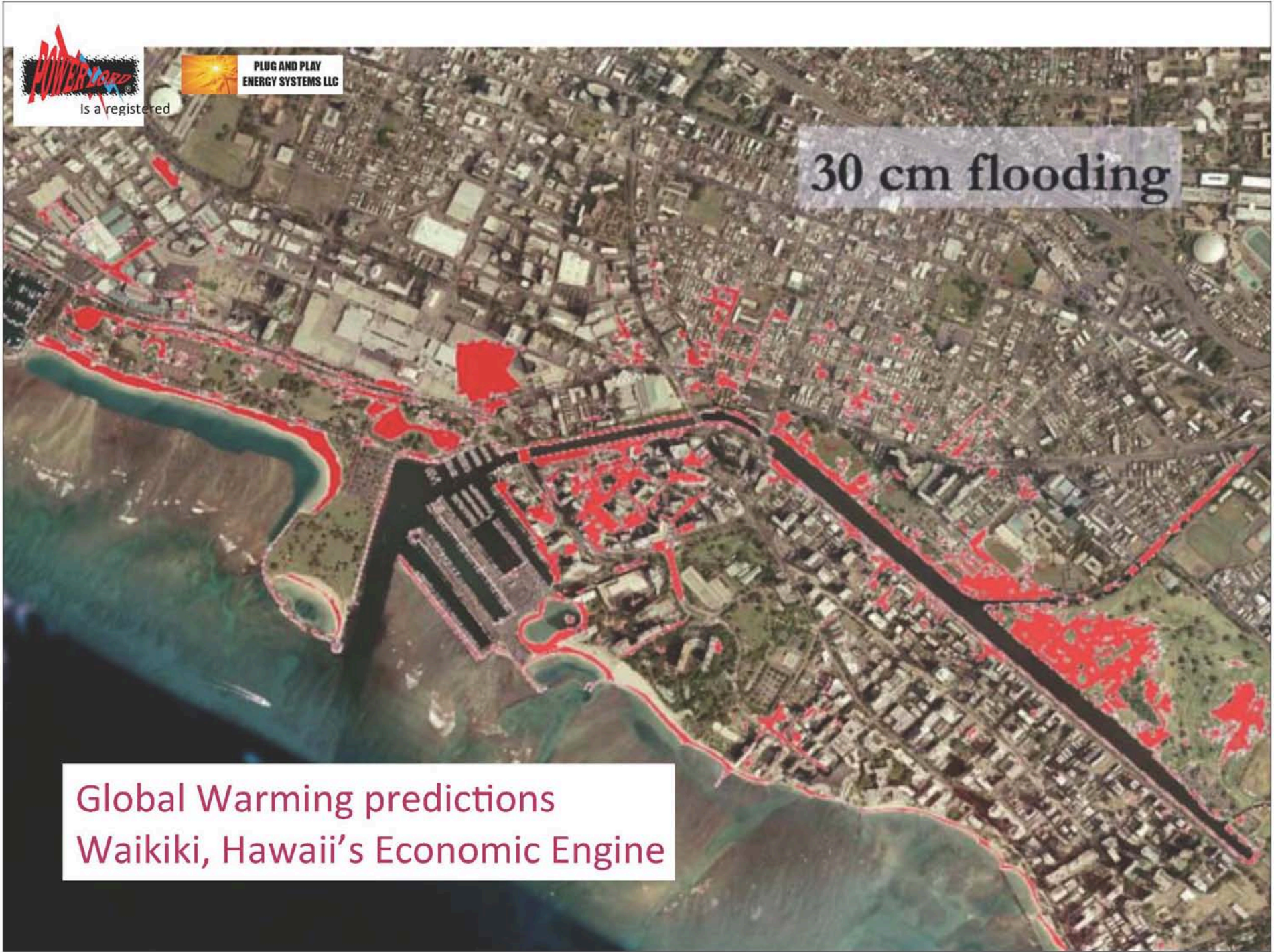
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30 cm flooding

Global Warming predictions
Waikiki, Hawaii's Economic Engine



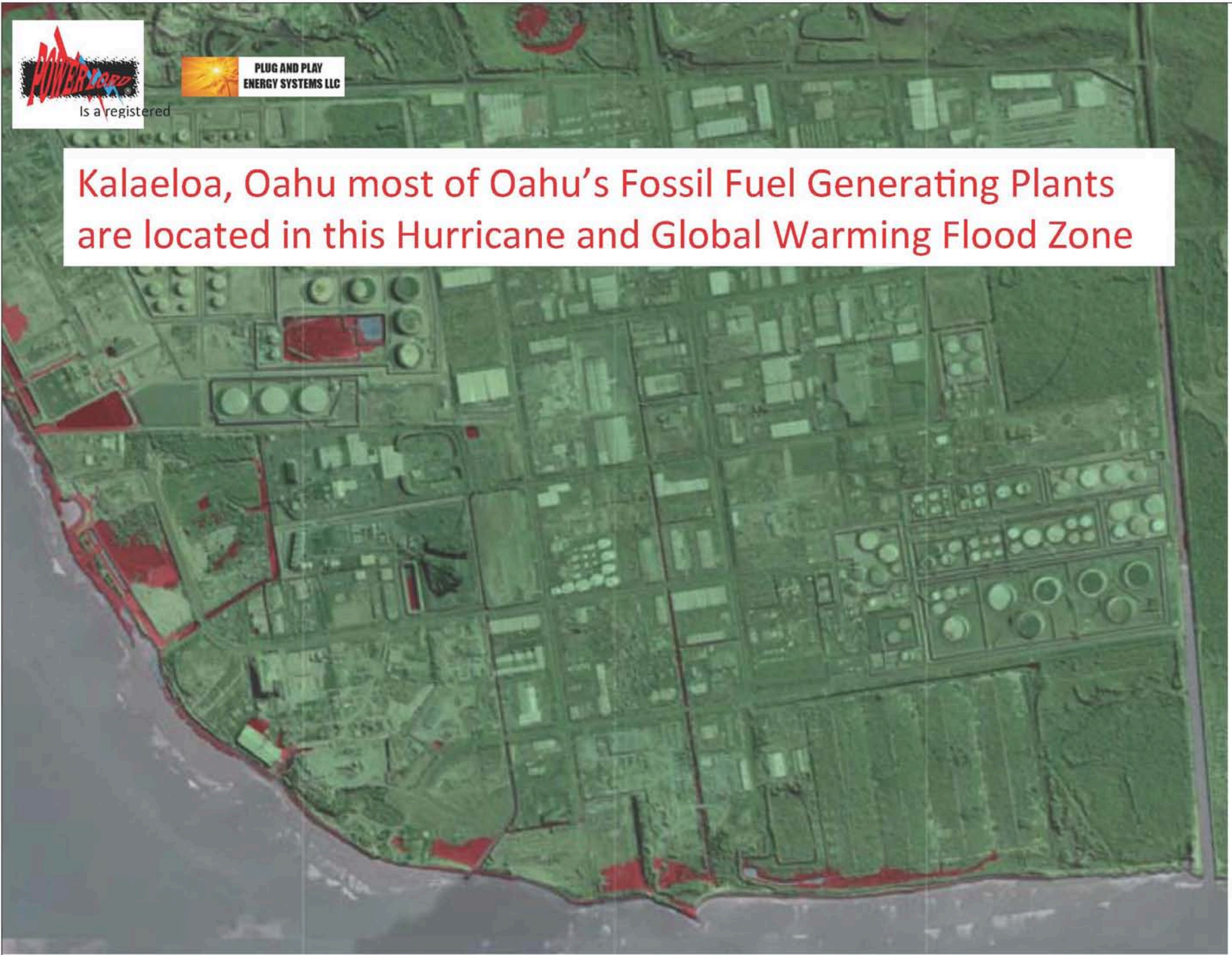


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Kalaheoa, Oahu most of Oahu's Fossil Fuel Generating Plants are located in this Hurricane and Global Warming Flood Zone





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PPES DER Examples Oahu Grid

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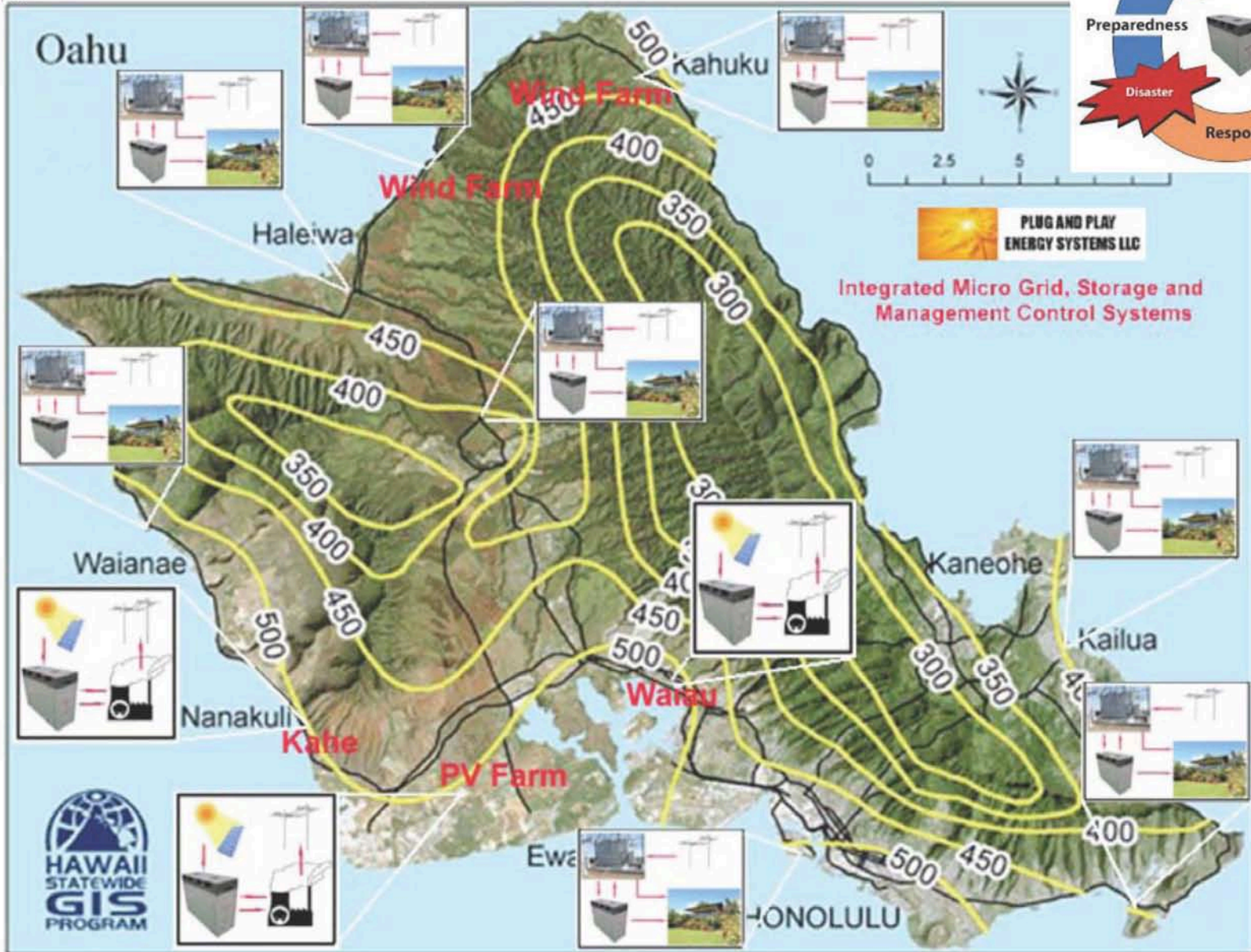


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SOME Examples of POSSIBLE Oahu DER Locations





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84-444 Jade St. - Makaha Substation



Toucan Storage Plant



UNIT: 4,5 Energy Spring 164
(288 ST523 620V 23,5kWh)
ENERGY: 4,5 MWh
POWER: 1,5 MW

- Photovoltaic integration
- PV system regulation
- Maximization of the PV output capacity





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66-9 Wailua Beach Rd. - Haleiwa Substation



Toucan Storage Plant



UNIT: 4,5 Energy Spring 164
(288 ST523 620V 23,5kWh)
ENERGY: 4,5 MWh
POWER: 1,5 MW

- Photovoltaic integration
- PV system regulation
- Maximization of the PV output capacity





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455 Lagoon Dr. Substation



Grid Services (Storage LAB)

UNIT: 4 Energy Spring 164 (256 ST523
620V 23,5kWh)

ENERGY: 4,15 MWh

POWER: 1,2 MW

- Grid Balancing
- Maximization of the power capacity transport of the Power Grid
- HV line Voltage Regulation





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Heleamano Substation - Kam Hwy. Wahiawa



oucan Storage Plant



UNIT: 4,5 Energy Spring 164
(288 ST523 620V 23,5kWh)
ENERGY: 4,5 MWh
POWER: 1,5 MW

- Photovoltaic integration
- PV system regulation
- Maximization of the PV output capacity





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91-1440 Farrington Hwy. - Ewa Nui Substation



Toucan Storage Plant



UNIT: 4,5 Energy Spring 164
(288 ST523 620V 23.5kWh)
ENERGY: 4,5 MWh
POWER: 1,5 MW

- Photovoltaic integration
- PV system regulation
- Maximization of the PV output capacity



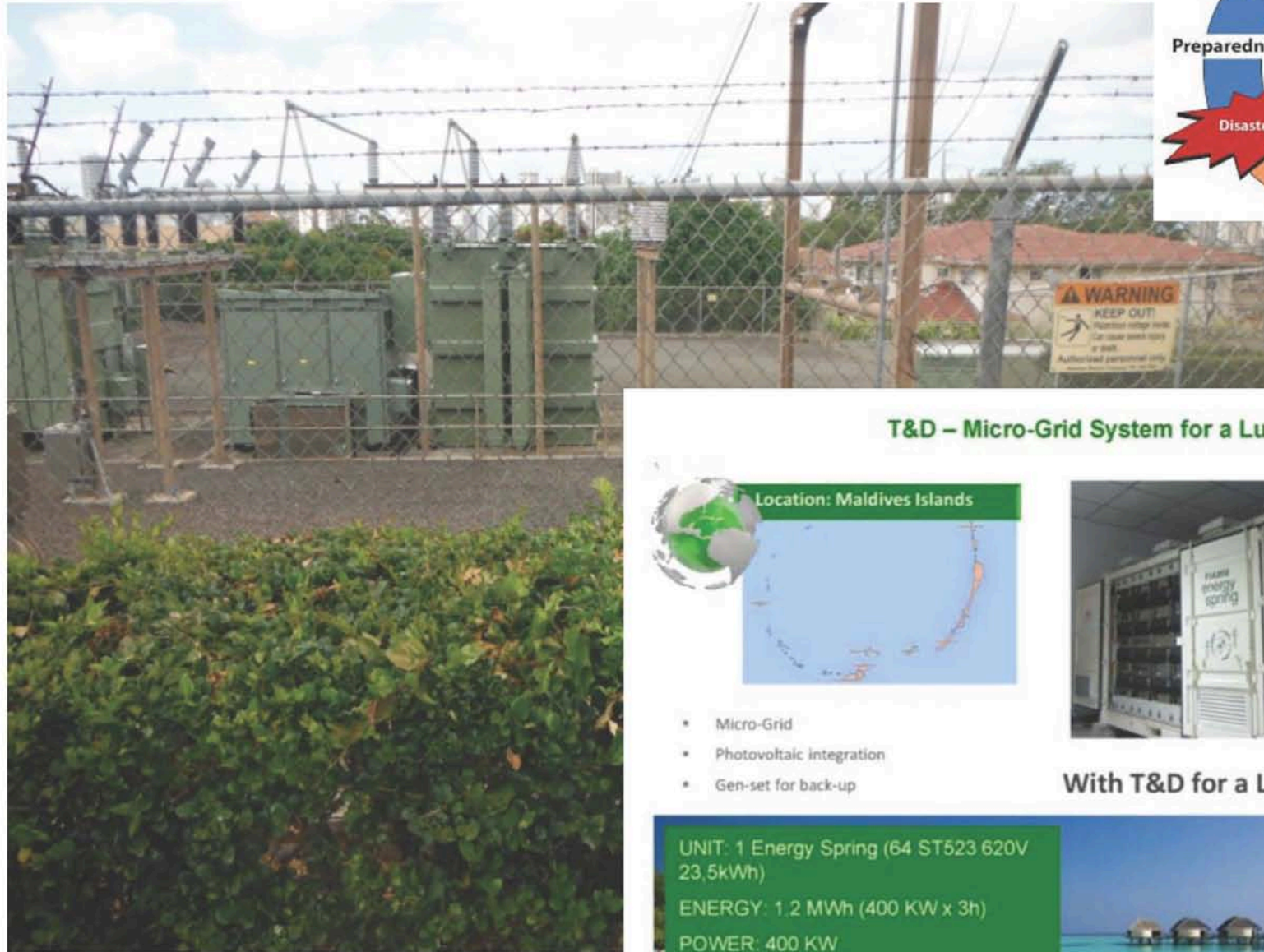


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1723 Hunnewell St. - Manoa - UH Substation



T&D – Micro-Grid System for a Luxury Resort



Location: Maldives Islands



- Micro-Grid
- Photovoltaic integration
- Gen-set for back-up



ENERGY STORAGE

With T&D for a Luxury Resort

UNIT: 1 Energy Spring (64 ST523 620V 23,5kWh)
 ENERGY: 1.2 MWh (400 KW x 3h)
 POWER: 400 KW



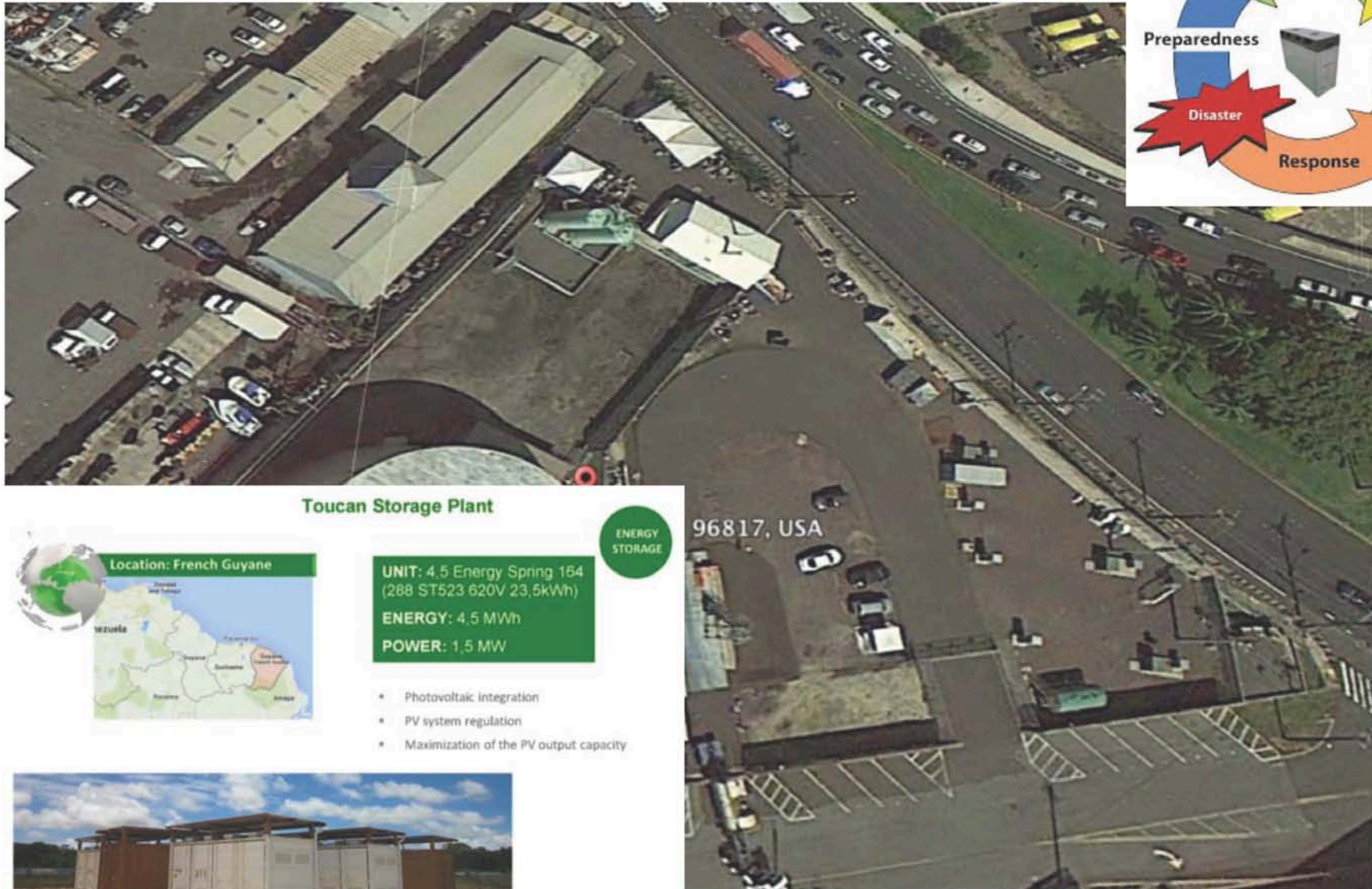


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855 Nimitz Hwy. - Iwilei Tank Farm



Toucan Storage Plant



Location: French Guyane



UNIT: 4,5 Energy Spring 164
(288 ST523 620V 23,5kWh)

ENERGY: 4,5 MWh

POWER: 1,5 MW

ENERGY
STORAGE

- Photovoltaic integration
- PV system regulation
- Maximization of the PV output capacity



96817, USA



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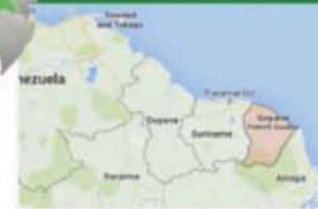
302 Ohua Av. - Waikiki



Toucan Storage Plant



Location: French Guyane



UNIT: 4,5 Energy Spring 164
(288 ST523 620V 23,5kWh)
ENERGY: 4,5 MWh
POWER: 1,5 MW



- Photovoltaic integration
- PV system regulation
- Maximization of the PV output capacity





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OUR PLANET HAWAII OUR HOME



From: mailinglist@capitol.hawaii.gov
Sent: Tuesday, February 09, 2016 11:45 AM
To: EEPtestimony
Cc: wilma@bonterrasolar.com
Subject: Submitted testimony for HB1823 on Feb 9,



HB1823

Submitted on: 2/9/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Wilma Del Rosario	Individual	Comments Only	No

Comments: REACH is in SUPPORT of HB 1823. Under NEM, utility customers generate clean renewable energy for their own use and send their excess renewable energy to the grid for use by other utility customers. The PUC noticed that, under the utility's NEM program, the excess energy sent to the grid was being given an arbitrarily high value. The arbitrarily high value meant that NEM customers were gaining wealth at the expense of non-NEM customers. The PUC dealt with the transfer of wealth issue by mistakenly setting an arbitrarily low value for the excess energy sent to grid. The PUC's mistake is closing the market for excess renewable energy sent to the grid. The PUC's mistake is putting as many as a thousand people out of work. What the bill does:

- Corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by valuing excess renewable energy sent to the grid at a rate "that reflects the value of such electricity to the utility, ratepayers and the public as measured by avoided capacity costs, avoided operating and maintenance costs, avoided fuel costs and avoided environmental costs" (the Value of Renewable or "VOR" rate)
- PUC annually determines the Value of Renewable rate
- Increases the NEM system capacity limit from 50 kW to 1 MW
- Increases the NEM aggregate capacity limit from ½ % of peak demand to the aggregate amount of such capacity that could be interconnected with the utility's electric system without substantial expenditure, as may be determined by the commission, by the utility for new mitigation facilities to maintain reliability of electric service
- Prohibits the utility from assessing interconnection requirements study charges and supplemental review charges against NEM customers

Summary: The bill corrects the PUC's mistake and eliminates the transfer of wealth from non-NEM customers to NEM customers by requiring that the HECO utilities value excess energy sent to the grid at a rate, determined by the PUC, that reflects the true economic value of such energy to all customers and to the general public. NEM needs to be expanded -- by raising capacity limits and by prohibiting discriminatory charges to NEM customers -- because Hawaii needs all the low-cost, decentralized, grid-connected renewable generation it can get for the day when imported fuels stop flowing to Hawaii. Thank you for allowing me to testify.

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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LATE

From: mailinglist@capitol.hawaii.gov
Sent: Tuesday, February 09, 2016 11:45 AM
To: EEPtestimony
Cc: alyssa@bonterrasolar.com
Subject: Submitted testimony for HB1823 on Feb 9, 2016 08:00AM

HB1823

Submitted on: 2/9/2016

Testimony for EEP on Feb 9, 2016 08:00AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Alyssa	Individual	Comments Only	No

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