

HB 2618, HD2

Measure Title: RELATING TO ENERGY STORAGE.

Report Title: Energy Storage; Tax Credit

Description: Establishes an income tax credit for each grid-connected energy storage property that is installed and placed in service in the State during the taxable year beginning after December 31, 2014; provided that this tax credit shall not be available for taxable years beginning after December 31, 2025. The tax credit may be claimed as either an investment credit or utilization credit. Effective July 1, 2112. (HB2618 HD2)

TESTIMONY OF HERMINA MORITA
CHAIR, PUBLIC UTILITIES COMMISSION
DEPARTMENT OF BUDGET AND FINANCE
STATE OF HAWAII
TO THE
SENATE COMMITTEE ON
ENERGY & ENVIRONMENT

MARCH 11, 2014
2:45 p.m.

MEASURE: H.B. No. 2618, H.D. 2
TITLE: Relating to Energy Storage

Chair Gabbard and Members of the Committee:

DESCRIPTION:

H.B. No. 2618, H.D. 2 would establish an income tax credit for taxpayers who install and place into service after December 31, 2014 and before December 31, 2025 a "grid-connected energy storage property" with a capacity of at least one megawatt-hour or one megawatt. The amounts for both the investment and utilization tax credit options are currently unspecified. This measure has an effective date of July 1, 2112.

POSITION:

The Commission would like to offer the following comments for the Committee's consideration.

COMMENTS:

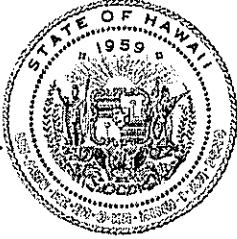
Energy storage has a role in Hawaii's strategy to achieve its clean energy policy goals through the development of a diverse and cost-effective portfolio of renewable resource and energy efficiency options, but it should be recognized that energy storage is not a panacea.

A variety of technologies have been found to be cost-effective in Hawaii, when used in the right application, to meet objectives including improved reliability and power quality, greater utilization of renewable energy, and management of demand. The

Commission cautions the Legislature in selecting one approach to incentivize over others. Each kind of technology or program has the potential to address a different combination of objectives and concerns under different conditions or in different locations. Artificially lowering the apparent cost of one technology has the potential to introduce market distortions, whereas a desired approach is to establish a competitive market structure where possible.

Finally, the Commission notes that, given this measure's one megawatt-hour/one megawatt capacity size requirement to qualify for the credit, there are currently a number of utility-scale energy storage systems operating in Hawaii that have been successfully financed and installed without the support of a state tax credit. Thus, the Commission believes that this measure may not be necessary to further encourage energy storage in the State.

Thank you for the opportunity to testify on this measure.



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

NEIL ABERCROMBIE
GOVERNOR

RICHARD C. LIM
DIRECTOR

MARY ALICE EVANS
DEPUTY DIRECTOR

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Statement of
Richard C. Lim
Director
Department of Business, Economic Development, and Tourism
before the
SENATE COMMITTEE ON ENERGY AND ENVIRONMENT

Tuesday, March 11, 2014
2:45 p.m.
State Capitol, Conference Room 225

in consideration of
HB 2618, HD 2
RELATING TO ENERGY STORAGE.

Chair Gabbard, Vice Chair Ruderman, and Members of the Committee.

The Department of Business, Economic Development and Tourism (DBEDT) has serious reservations about HB 2618, HD 2, which establishes an investment tax credit and utilization tax credit for grid-connected energy storage properties.

DBEDT appreciates the importance of adding energy storage capacity to Hawaii's electrical grid; however, we are concerned about meeting the requirements of an unfunded mandate that may also be inconsistent with the State's established energy policy directives of balancing technical, economic, environmental, and cultural considerations, and allowing for market-driven solutions.

Moreover, the precise economic impact analysis requested by this measure is not possible to perform because 1) some of the required data do not exist, e.g., the net flow of money in and out of state, the number of jobs maintained, and the average pay of the jobs and 2) the Department of Taxation does not have the ability to release individual tax payer information, so it is impossible to know who is claiming the tax credit without acquiring the information in some other way, e.g., an online survey. The required information can be gathered through an online survey if the survey is required to be submitted by statute by all tax credit claimants. A similar

approach that uses an online survey was passed by the Legislature in Act 270 (13) for the Research Activities Tax Credit. DBEDT will be posting that online survey by next week.

DBEDT estimates that the initial economic impact study in this measure would cost approximately \$250,000. Subsequent annual studies would likely be less costly.

DBEDT defers to the Department of Taxation on the fiscal implications of this bill.

Thank you for the opportunity to offer these comments.

NEIL ABERCROMBIE
GOVERNOR

SHAN TSUTSUI
LT. GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TAXATION

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FREDERICK D. PABLO
DIRECTOR OF TAXATION

JOSHUA WISCH
DEPUTY DIRECTOR

To: The Honorable Mike Gabbard, Chair
and Members of the Senate Committee on Energy and Environment

Date: Tuesday, March 11, 2014
Time: 2:45 P.M.
Place: Conference Room 225, State Capitol

From: Frederick D. Pablo, Director
Department of Taxation

Re: H.B. No. 2618, H.D. 2, Relating to Energy Storage

The Department of Taxation (Department) appreciates the intent of H.B. 2618, H. D. 2, to support the renewable energy industry and provides the following comments for the Committee's consideration.

H.B. 2618, H.D. 2, creates an income tax credit for grid-connected energy storage properties. The credit is nonrefundable but can be converted to a refundable credit at the taxpayer's election to accept a 30% discount on the amount of the credit. The tax credit can be claimed as an investment credit equal to an unspecified percentage of the basis or as a utilization credit equal to the product of the capacity of the property and the number of days for which the credit applies multiplied by an unspecified number of cents. This measure has a defective effective date of July 1, 2112.

The credit applies to grid-connected energy storage properties which are installed and placed in service during a taxable year beginning after December 31, 2014 and before December 31, 2025. Both the investment and utilizations credit calculations are separated into two paragraphs for grid-connected storage property first placed in service on or before December 31, 2020 and after December 31, 2020 but on or before December 31, 2025.

The Department offers the following technical comments for your consideration.

First, the grid-connected energy storage property as described in this measure already qualifies as an accessory under the Renewable Energy Technologies Income Tax Credit (RETITC) provided under section 235-12.5, Hawaii Revised Statutes (HRS), if installed with the energy producing portion of the system. The Department will defer to the Department of

Economic Development, Business, and Tourism (DBEDT), as to whether an additional tax credit should be provided to store electricity.

Second, the Department suggests that one method of computing the credit be chosen. Two methods of calculation will cause unnecessary confusion for taxpayers and difficulty for the Department in administering and enforcing the tax credit claims.

Third, the Department suggests that subsection (e), which requires DBEDT certification, be clarified in terms of the timing and procedure for the certification process. Taxpayers often have taxable years which do not coincide with the calendar year; therefore, the Department suggests that taxpayers be required start the certification process a minimum of 90 days or more prior to their needing the certification.

Finally, the Department is unable to comply with the requirement that twenty days prior to the start of each regular session, the Department report on data from the preceding taxable year. Since taxpayers do not file their tax returns until after the close of the taxpayer's taxable year, the Department does not have any data from the preceding taxable year. In other words, the Department generally does not have all the tax returns for a taxable year processed until approximately 15 months **after** the close of the taxable year. One of the delays is the need for the Department's statistical staff to manually aggregate tax credit data claimed on tax returns that are not electronically processed.

The Department also notes that some of the information requested in this measure is not reported by taxpayers on the tax forms, nor captured by our computer system. For example, the Department does not have specific data on the number or types of properties, but only aggregate data on the credit amounts claimed by taxpayers. The Department is also unable to comply with the requirement to perform an economic benefit analysis attributable to the tax credit, as the Department does not perform dynamic economic analysis; instead, the Department defers to DBEDT regarding its ability to provide this type of analysis.

Thank you for the opportunity to provide comments.



SENATE COMMITTEE ON ENERGY & ENVIRONMENT
Tuesday, March 11, 2014 – 2:45 p.m. – Room 225

Ulupono Initiative Strongly Supports HB 2618 HD 2 with amendments, Relating to Energy Storage

Dear Chair Gabbard, Vice Chair Ruderman and Members of the Committee:

My name is Murray Clay and I am managing partner of the Ulupono Initiative, a Hawai'i-based impact investment firm that strives to improve the quality of life for the people of Hawai'i by working toward solutions that create more locally grown food, increase renewable energy, and reduce/recycle waste. Ulupono invests in projects that have the potential to create large-scale, innovative change.

Ulupono strongly supports HB 2618 HD 2 with amendments, which establishes an energy storage tax credit for grid-connected renewable energy projects. In recent years Hawai'i has seen significant growth in renewable energy adoption moving the State towards its renewable energy goals. However, over the last year in particular, interconnection of renewable energy systems has become increasingly problematic. The growth rate in new residential solar PV systems, for example, has begun to decline this year. The interconnection of utility-scale renewable energy systems is stretching over years. If the existing interconnection problems continue, renewable energy growth will stagnate in Hawai'i. A modern, flexible grid is necessary to maximize renewable energy penetration.

Energy storage is one of the primary means by which to increase grid flexibility and resilience. Circuits that are currently completely closed to additional renewable energy could effectively be opened up with sufficient storage in place. Furthermore, energy storage has the ability to decrease the curtailment of existing renewable energy – energy that is currently being wasted. A modest tax credit, as proposed by this bill, could be sufficient to push currently expensive storage technology into mainstream use in Hawai'i, thus opening the door to further renewable energy use and a reduction in expensive oil use. For these reasons we support HB 2618 HD 2.

Some opponents of this bill have suggested that the currently available renewable energy tax credit (RETITC) covers energy storage. While this is theoretically true, due to the DOTAX administrative ruling and the dollar caps on the tax credit, utility scale systems often hit the cap and therefore have no ability to apply a tax credit against the energy storage portion of their development costs. For example, Ulupono performed due diligence on a 5 MW solar project only to find that due to the DOTAX ruling and dollar caps, the project would effectively get only a 20% ITC not the maximum 35% ITC. Again, this indicates that there is no "room" left for energy storage in the current law/credit. Also, in the unlikely event that there would be "room" left in the currently available tax credit for storage, this bill disallows any credit for which another credit is claimed. This bill allows for no double counting.

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It is also important to note that though this bill does not have fixed dollar caps, it is highly unlikely that a large number of storage projects will happen over the next several years. The grid needs utility scale batteries in a select number of locations. Furthermore, the utility and PUC need to work together to create a market for ancillary services (including storage) before energy storage will be able to reach it's potential in Hawai'i. This will take time. Lastly, other than batteries developed and financed with large-scale renewable energy projects and the two pilot battery installations reportedly being worked on by NELHA and the utility, there are no utility scale batteries currently in Hawai'i. In short, there are many reasons we need energy storage in Hawai'i but also many reasons why it will take some time for utility scale storage to show up. Caps are simply not needed for the foreseeable future.

However, we would recommend the following figures be added into the blank amounts:

- On page 2, line 15: "20%" for the first period through 2020
- On page 2, line 19: "15%" for the second period through 2025
- On page 3, line 1: "8" cents for the first period through 2020
- On page 3, line 5: "6" cents for the second period through 2025

We feel these recommended figures would adequately balance incentivizing investment in energy storage but not overly burden the State's finances.

We strongly believe that this bill has the potential to open the door for significant renewable energy growth in Hawai'i.

Thank you for this opportunity to testify.

Respectfully,

Murray Clay
Managing Partner

Email: communications@ulupono.com

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TAX FOUNDATION OF HAWAII

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SUBJECT: INCOME, Grid-connected energy storage tax credit

BILL NUMBER: HB 2618, HD-2

INTRODUCED BY: House Committee on Consumer Protection and Commerce

EXECUTIVE SUMMARY: This measure would allow a taxpayer to claim a tax credit for each grid-connected energy storage property placed into service between 1/1/15 and 12/31/25. The taxpayer may choose either an investment credit or a unitization credit, but not both. The credit amounts are unspecified. Because energy storage property is generally built to support some type of alternative energy generator, such as a solar farm, it may be seen as integral to the generator. As such, energy storage property may already be eligible for the renewable energy technologies credit under HRS section 235-12.5 on the state level and under IRC section 45 or 48 on the federal level, as determined in PLR (Private Letter Ruling) 201308005. If so, this measure may not be necessary.

BRIEF SUMMARY: Adds a new section to HRS chapter 235 to allow an individual or corporate net income taxpayer to claim an income tax credit for each grid-connected energy storage property that is installed and placed in service during a taxable year after 12/31/14 and shall not be available for tax years beginning after 12/31/25. The tax credit may be claimed in either, but not both, of the following forms:

Investment credit: An investment credit equal to: (1) for a grid-connected energy storage property first placed in service on or before December 31, 2020, not more than ___% of the basis; or (2) for a grid-connected energy storage property first placed in service after December 31, 2020, and on or before December 31, 2025, not more than ___% of the basis; or:

Utilization credit: A utilization credit equal to: (1) for a grid-connected energy storage property first placed in service on or before December 31, 2020, ___ cents per kilowatt-hour of energy storage capacity; or (2) for a grid-connected energy storage property first placed in service after December 31, 2020, and on or before December 31, 2025, ___ cents per kilowatt-hour of energy storage capacity. Permits the utilization credit to be claimed during each of the first ten taxable years that the grid-connected energy storage property is in service; provided that this annual utilization credit shall not exceed the product of the energy storage capacity measured in kilowatt-hours, multiplied by 365, multiplied by the applicable number of cents per kilowatt-hour.

Multiple owners of a grid-connected energy storage property shall be entitled to a single tax credit, and the tax credit shall be apportioned between the owners in proportion to their contribution to the basis of the grid-connected energy storage property. In the case of a partnership, S corporation, estate, or trust, the tax credit allowable shall be for every eligible grid-connected energy storage property that is installed and placed in service in the state by the entity. The basis upon which the tax credit is computed shall be determined at the entity level. Distribution and share of credit shall be determined pursuant to section 235-110.7(a).

Defines “basis,” “energy storage capacity,” “first placed in service” and “grid-connected energy storage property” for purposes of the measure.

Credits in excess of a taxpayer’s income tax liability may be applied to subsequent income tax liability until exhausted. Requires all claims for the credit to be filed on or before the end of the twelfth month following the close of the taxable year. The director of taxation may adopt rules pursuant to HRS chapter 91 and prepare the necessary forms to claim the credit and may require proof of the claim for the credit.

For any grid-connected energy storage property, a taxpayer may elect to reduce the eligible credit amount by 30% and, if this reduced amount exceeds the amount of income tax payment due from the taxpayer, the excess of the credit amount over payments due shall be refunded to the taxpayer; provided that no refund on account of the tax credit allowed by this section shall be made for amounts less than \$1. Allows an association of owners under HRS chapters 421I, 421J, 514A, or 514B to claim the credit allowed under this section in its own name for grid-connected energy storage property placed in service and located on common areas. No credit under this section shall be allowed to any federal, state, or local government or any political subdivision, agency, or instrumentality thereof.

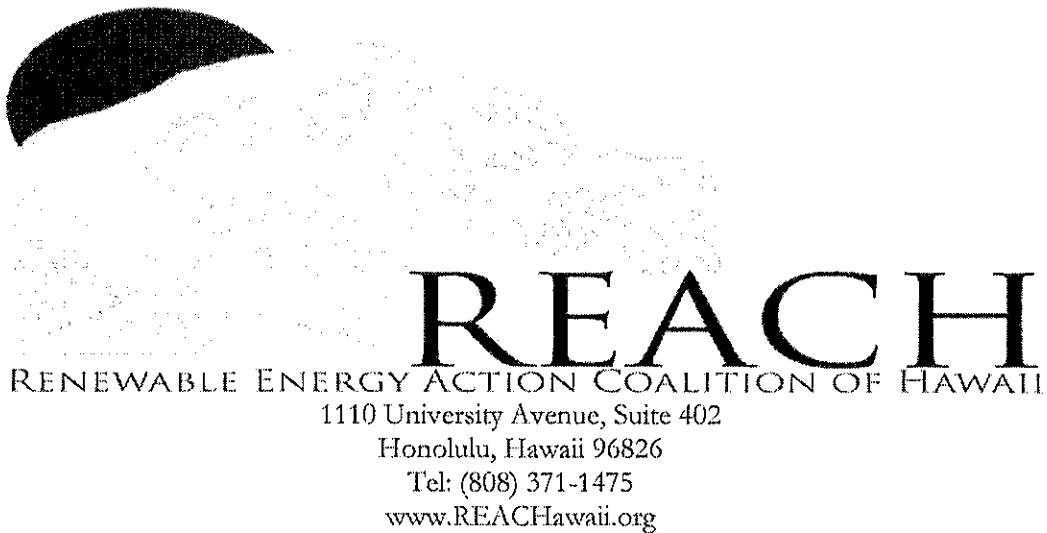
Directs the department of taxation, in collaboration with the department of business, economic development, and tourism (DBEDT) to submit a report to the legislature on: (1) the number of grid-connected energy storage properties that have qualified for a tax credit during the preceding calendar year; (2) the total cost of the tax credit to the state during the taxable year; and (3) the estimated economic benefit that may be attributable to the grid-connected energy storage tax credit.

EFFECTIVE DATE: July 1, 2112

STAFF COMMENTS: The proposed measure would establish income tax credits to encourage the use of grid-connected energy storage technologies and systems. This measure would establish an investment credit of ___% of the basis or a utilization credit equal to ___ cents per kilowatt hours for such systems. However, such systems may already be eligible for the renewable energy technologies credit under HRS section 235-12.5; indeed, the IRS recently recognized, in PLR (Private Letter Ruling) 201308005, that such energy storage systems can be considered an integral part of a renewable energy system because it helps the underlying photovoltaic or wind system stabilize its output and thereby lessen its impact on the grid.

While the measure also proposes to define what types of storage property qualify for the proposed credit, consideration might be given to adopting the federal definitions of alternate energy devices which qualify for preferential treatment rather than attempting to make up rules and definitions that would be unique to Hawaii. At least administrators could look to the federal standards for these devices for guidance.

Instead of providing tax incentives via tax credits for the purchase of existing technology, lawmakers may want to take advantage of Hawaii’s natural environment which lends itself to all sorts of possibilities to explore and develop more efficient means of harnessing the natural resources that pervade the Islands, from wind to sun to geothermal to hydrogen from Hawaii’s vast resources, all of which could be further developed with the assistance and cooperation of government in Hawaii.



Testimony of ERIK KVAM
President of Renewable Energy Action Coalition of Hawaii
e-mail: Kvam@REACHhawaii.org

In SUPPORT of HB2618 HD 2 RELATING TO ENERGY STORAGE

**Before the
SENATE COMMITTEE ON ENERGY AND ENVIRONMENT**

March 11, 2014 2:45 p.m.

Aloha, Chair Gabbard, Vice-Chair Ruderman and members of the Committee.

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

REACH SUPPORTS THE INTENT of HB 2618 HD 2, and believes that it should be amended to apply the tax credit to all energy storage property, not just “grid-connected” energy storage property having a capacity of one MW or one MWh.

Hawaii’s renewable energy technologies tax credit applies only to intermittent solar and wind generation. It does not apply to energy storage or any forms of dispatchable renewable generation.

Without large amounts of energy storage, the large amounts of intermittent solar and wind generation that have been and will be added to the Hawaiian island grids will be undispachable and unusable when imported fuels stop flowing to Hawaii.

REACH SUPPORTS THE INTENT of HB 2618 HD 2 – creating an energy storage tax credit that complements the existing renewable energy technologies tax credit -- to

encourage development of the dispatchable renewable generation that Hawaii needs when imported fuels stop flowing to Hawaii.

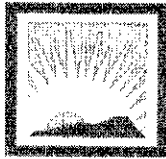
REACH SUPPORTS AMENDMENTS to HB 2618 HD 2 that would apply the tax credit to all energy storage property, not just “grid-connected” energy storage property having a capacity of one MW or one MWh.

The limitation to “grid-connected” energy storage property having a capacity of one MW or one MWh means that the credit could not be used by any self-generators, such as residential and commercial PV system owners, who install energy storage systems behind-the-meter for their own dispatchable power needs, or who install energy storage systems to provide dispatchable energy for their own off-the-grid or microgrid operations. The limitation forecloses the possibility of increasing Hawaii’s energy resilience through investment by self-generators, whether grid-connected or off-the-grid, in energy storage systems.

The limitation also means that the tax credit could not be used by any prospective owners of grid-connected energy storage systems less than one MW or one MWh who want to sell energy storage services to the electric utility. The limitation forecloses the possibility of increasing Hawaii’s energy resilience through investment in small-scale (< 1 MWh) distributed energy storage systems could be more cost-effective than investment in large-scale (> 1 MWh) systems.

REACH recommends that HB 2618 HD 2 be amended to apply to all energy storage property, regardless of whether it is “grid-connected,” and regardless of its capacity measured in MW or MWh, to encourage wide-scale development of the dispatchable renewable generation that Hawaii needs when imported fuels stop flowing to Hawaii

Thank you for allowing me to testify.



Hawaii Solar Energy Association
Serving Hawaii Since 1977

Before the Senate Committee on Energy and Environment
Tuesday, March 11, 2014, 2:45 p.m., Room 225
HB 2618 HD 2: RELATING TO ENERGY STORAGE

Aloha Chair Gabbard, Vice-Chair Ruderman, and members of the Senate Committee on Energy and Environment,

On behalf of the Hawaii Solar Energy Association (HSEA), I would like to testify in general support for the intent of HB 2618 HD2, which establishes an income tax credit for each grid-connected energy storage property that is installed and placed in service after December 31, 2014, so long as the storage device has a capacity of at least one mega-watt hour or one megawatt. HSEA is a non-profit trade organization that has been advocating for solar energy since 1977, with an emphasis on solar hot water (SHW) and Photovoltaics (PV) in both residential and small commercial installations. We currently represent 81 companies, which employ thousands of local workers in the solar industry. With 37 years of advocacy behind us, HSEA's goal is to work for a sustainable energy future for all of Hawaii.

Developing energy storage is the key next step in securing our energy future in Hawaii. With adequate energy storage, Hawaii can take maximum advantage of its indigenous energy sources by storing excess energy when generation does not meet demand, and making use of storage to offset expensive peak power production. Storage can also provide a variety of ancillary services that aid in grid stability and efficiency, and is what is needed to ramp down and eliminate our fossil fuel dependence.

However, HSEA questions why HB 2618 HD 2 is limited to large scale storage starting at 1 MW and above. Although providing incentives for large projects has definite value, the interest in energy storage for distributed generation systems has grown significantly in the last few years, and these are customers who are willing to invest their own funds in the state's green energy infrastructure.

U.S. Secretary of Energy Dr. Ernest Moniz stated in the press that the rapid development of rooftop solar and battery storage technology could be as transformative to the economy and modern life as the U.S. oil and gas boom (Bloomberg March 7, 2014). Let's follow Dr. Moniz's lead and support energy storage for distributed generation tied to residential and small commercial systems.

Thank you for the opportunity to testify
Leslie Cole-Brooks
Executive Director
Hawaii Solar Energy Association



Directors

Jody Allione
Silver Ridge

Joe Boivin
Hawaii Gas

Kelly King
Pacific Biodiesel

Warren S. Bollmeier II
WSB-Hawaii

TESTIMONY OF WARREN BOLLMEIER ON BEHALF OF THE
HAWAII RENEWABLE ENERGY ALLIANCE BEFORE THE
SENATE COMMITTEE ON ENERGY AND ENVIRONMENT

HB 2618 HD2, RELATING TO ENERGY STORAGE

March 11, 2014

Chair Gabbard, Vice-Chair Ruderman and members of the Committee, I am Warren Bollmeier, testifying on behalf of the Hawaii Renewable Energy Alliance (HREA). HREA is an industry-based, nonprofit corporation in Hawaii established in 1995. Our mission is to support, through education and advocacy, the use of renewables for a sustainable, energy-efficient, environmentally-friendly, economically- sound future for Hawaii. One of our goals is to support appropriate policy changes in state and local government, the Public Utilities Commission and the electric utilities to encourage increased use of renewables in Hawaii.

The purpose of HB 2618 HD2 is to establish an income tax credit for each grid-connected energy storage property that is installed and placed in service in the State during the taxable year beginning December 31, 2014; provided that this tax credit shall not be available for taxable years beginning after December 31, 2025. The tax credit may be claimed as either an investment credit or utilization credit.

HREA **supports** this measure with the following comments and recommendations:

- 1) Comments. This measure supports our clean energy goals as we will need storage to facilitate the integration of renewables and energy efficiency on our island grids. With respect to the provisions of this measure:
 - a) We do not have any recommendations at this time for "filling in the blanks," e.g., what percentage or how many cents/kWh.
 - b) The measure offers two options for payment: investment tax credit (the credit would be taken upon installation) and utilization tax credit (the credit would be paid out over a 10 year period). If there is concern about fiscal impact, the utilization tax credit might be preferred as the annual fiscal impacts would be spread out over 10 years.
- 2) Recommendations: We recommend the committee pass this measure out.

Mahalo for this opportunity to testify.

PRINCETON ENERGY GROUP

Innovation in Renewable Energy

STEVE TABER
Chairman and CEO

PRINCETON ENERGY GROUP'S TESTIMONY IN SUPPORT OF HB 2618, HD2

SENATE COMMITTEE ON ENERGY AND ENVIRONMENT
Tuesday, March 11, 2014 at 2:45PM

Good afternoon Chair Gabbard, Vice chair Ruderman, and members of the Committee:

Princeton Energy Group ("Princeton") supports HB2618, HD2 and respectfully requests that the Committee pass it out.

We are currently engaged in the Ikehu Molokai Project. The island of Molokai suffers from very high electric rates, a grid that is unstable electrically, and a large carbon footprint. The Ikehu Molokai project aims to solve these problems by converting the island's electric system to 100% renewable energy. This effort will require a mix of technologies and multiple phases, and it will be the work of several years. Nevertheless, we are committed to the success of the project. No modern electric grid of this significance has been converted from 100% carbon-based fuels to 100% renewable energy, so the Ikehu Molokai project will serve as an example of high levels of renewable energy penetration, while keeping rates affordable and the grid stable. As such, Molokai and Hawaii will serve as an example to other islands and to utilities and policy-makers all over the world.

In order to achieve a high penetration of renewable energy on Molokai's weak grid, it is necessary to install a large amount of energy storage. This is fundamentally different from the storage installations on larger grids, such as Oahu and Maui. On the larger grids, renewable energy projects must sometimes install relatively small amounts of storage to mitigate short-term fluctuations in output and prevent transient voltage spikes. This is sometimes called a "Smoothing" application of storage. The cost of such Smoothing storage is typically a small fraction of the overall cost of the renewable generation.

In contrast, on small grids such as Molokai's, it is necessary to install a large amount of storage to shift production from the hours when it is generated into the hours when the need is greatest. As such, it is very valuable, in that it converts low-value energy generated when it

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isn't needed to high-value energy available when the need is greatest. However, it is very expensive; on the Ikehu Molokai project, for example, the cost of adding this storage will more than double the overall cost of the project.

To illustrate this contrast, below is a simplified analysis of 10 MW renewable projects, one on a large island grid and the other on a small island grid. (The latter is representative of Molokai.) The large island project has a small storage capability, intended for smoothing; the small island project has a large storage capability for shifting the generation into the high-need evening hours. Note that the large island project has a healthy return on investment of 11.23%, even at a PPA price of \$120/MWh. The small island project has a sub-market return of 5.62%, even with a higher PPA price of \$200/MWh.

| | <u>Smoothing/large island</u> | <u>Generation shifting (small island)</u> | | |
|---|-------------------------------|---|------------------|--------------|
| generation capacity (KW) | 10,000 | 10,000 | | |
| generation capital cost (\$) | 20,000,000 | 20,000,000 | | |
| storage cost (\$) | 1,000,000 | 41,000,000 | | |
| total capital cost (\$) | 21,000,000 | 61,000,000 | | |
| energy generated (MWh/yr) | 20,148 | 20,148 | | |
| energy delivered (MWh/yr) | | daytime | nighttime | total |
| Gross | 20,148 | 5,037 | 15,111 | 20,148 |
| less storage losses | (504) | 0 | (3,022) | (3,022) |
| net energy delivered | 19,644 | 5,037 | 12,089 | 17,126 |
| revenue (\$/MWh) | 120 | 200 | 200 | |
| revenue (\$) | 2,357,316 | 1,007,400 | 2,417,760 | 3,425,160 |
| unleveraged return on investment | 11.23% | | | 5.62% |

Therefore, some form of financial incentive is vitally important to the success of the Ikehu Molokai project.

The economic impact of the tax credit bill to enable energy storage investments in Hawaii will be strongly positive. In the numerical illustration above, we assume a small island generation-shifting energy storage to cost \$41 million. The tax credit will amount to 20%, or approximately \$8 million. On a small island, such as Molokai, the renewable energy project with this type of energy storage can lead to reduction in electricity rates for the residents of 5 to 8 cents per kWh. Over the 20 year life of the energy storage equipment, this will result in savings to the residents of at least \$20 million. In addition, over the same period, the renewable energy/energy storage project will create at least 200 person-years of jobs on the island, representing at least \$10,000,000 in direct economic activity and about 3 times that much, or \$30,000,000, in indirect economic activity. Furthermore, in the case of Molokai, the reduced electricity costs will make water more affordable for homesteaders and Molokai businesses more cost-efficient, which will also stimulate economic activity.

We strongly recommend that the bill retain provisions both for an Investment Tax Credit (ITC), as described in §235(1), and a Utilization Tax Credit (UTC), as described in §235(1). Federal policy has provided both an ITC and a Production Tax Credit (PTC). (The federal PTC is analogous to the UTC in HB2618.) The federal PTC has proved to be a strong

incentive for project developers to drive down the capital cost of renewable energy equipment; the UTC may be expected to have a similar result for energy storage projects in Hawaii.

The tax credit for storage is essential because, under current state regulations, energy storage for utility-scale projects does not fall under the credit for solar systems. The credit for solar systems is effectively limited to \$500,000 per MW, so the addition of storage to a solar project does not make it eligible for a larger credit. (This does not apply to residential systems, which are much smaller and fall under the dollar cap.)

The current draft of HB2618, HD2 leave blank the amount of the credit. We recommend the following:

| | |
|------------|------------|
| §235(1)(A) | 20% |
| §235(1)(B) | 15% |
| §235(2)(A) | .089 cents |
| §235(2)(b) | .067 cents |

The values for §235 (.089 cents and .067 cents) are equivalent to the UTC, based on a common industry assumption of capital cost of \$1,000,000 per MWh of storage.

Either HD1 or HD2 is acceptable to us.

Therefore, we respectfully request that this measure be passed out.

Thank you for the opportunity to testify.

Sincerely,
Princeton Energy Group

Steve Taber
Chairman & CEO

Princeton Energy Group is a company of renewable energy veterans deploying renewable energy projects and technologies around the world. The mission of the Princeton Energy Group is to expand the reach of renewable energy and energy efficiency in the marketplace through innovation in technology, business models, and financing techniques. We bring to every task exceptionally qualified individuals, skilled in finding unique resource and business solutions to difficult problems. The founders of Princeton have been at the forefront of the renewable energy industry since its early days in the 1970s in California. In addition to our for-profit activities through Princeton Energy Group, we have held influential positions in state and federal government and have served in the non-profit sector.



MOLOKAI RANCH

Treasured heritage. Vibrant future.

TESTIMONY IN SUPPORT OF HB 2618, HD2 SENATE COMMITTEE ON ENERGY & ENVIRONMENT

Tuesday, March 11, 2014 at 2:45pm Conf. room 225

Testifier: Clay R. Rumbaoa - CEO, Molokai Properties Limited (dba Molokai Ranch)

Goodafternoon & Aloha Chair Gabbard, Vice Chair Ruderman and Committee Members:

Molokai Ranch supports HB2618, HD2. Like many Maui Electric Company (MECO) service areas, implementation of solar energy on Molokai has reached its allowable limit. In order to continue generating power from our abundant sunshine in Hawaii, we need to add energy storage. Energy storage is even more critical as we start generating solar power on a utility scale.

Molokai has one of the highest electricity rates in Hawaii, ranging from \$0.48 to \$0.52 per kwh. This bill will allow storage technology to be designed & implemented, thus allowing MECO to accept more renewable energy, thus lowering our utility costs.

Therefore, we respectfully request that HB2618, HD2 be passed out of committee.

Mahalo,

Clay R. Rumbaoa

Clay R. Rumbaoa

**Testimony before the
Senate Committee on Energy and Environment**

H.B. 2618 HD2 – Relating to Energy Storage

**Tuesday, March 11, 2014
2:45 pm, Conference Room 225**

**By Darren Ishimura
Acting Manager, Grid Technologies Department
Hawaiian Electric Company**

Written Testimony Only

Chair Gabbard, Vice Chair Ruderman, and Members of the Committee:

My name is Darren Ishimura, Acting Manager of Grid Technologies at Hawaiian Electric. I am testifying on behalf of Hawaiian Electric and its subsidiary utilities, Maui Electric and Hawai'i Electric Light (collectively the "Hawaiian Electric Companies").

The Hawaiian Electric Companies support HB 2618 HD2 as this tax credit can reduce energy storage project costs, and thus benefit all customers. The Hawaiian Electric Companies envision that the portfolio of energy storage systems that support the electric grid of the future will likely consist of utility-owned storage systems and non-utility storage systems. Tax credits applied to utility-owned storage would allow us to reduce the amount of cost recovery needed from our customers, just as credits applied to non-utility owned storage should enable the owners of those systems to supply lower cost storage services to the utility. Hence all electric utility customers can benefit from this tax credit.

Thank you for the opportunity to testify.

Statement of
**Shawn Bailey, Regulatory and Market Analysis Manager
Sempra US Gas and Power**

Before the Senate Committee On **Energy And Environment**
March 11, 2014
2:45 PM
State Capitol, Conference Room 225

In consideration of
HB2618 HD2 RELATING TO ENERGY STORAGE

Chair Gabbard, Vice Chair Ruderman, and Members of the Committee on
Energy and Environment

Sempra USG Supports HB2618 HD2 Relating to Energy Storage.

Sempra USGP's fleet includes over 2000 MW of wind, solar and natural gas fueled generation. Sempra USGP's Auwahi wind project on Maui includes 21MW of wind generation in combination with 11MW and 4.4MWh of battery storage capacity.

There are a number of factors that make the Hawaii's consideration of energy storage particularly timely. First, storage is uniquely capable of dealing with generation variability associated with the current significant intermittent renewable penetration in the state, and the increasing renewable procurement goals. For example, since storage acts as both generation capacity and load, it can help accommodate periods of over-generation and generation variability by the renewable fleet. In addition, increasing distributed generation on the system, including rooftop solar, makes maintaining the balance between demand and supply more challenging, and can result in less efficient operation for some of the flexible thermal generators on the system.

Other states with similar renewable goals are moving aggressively to procure storage as a means to maximize the benefit of prior and future renewable procurement, and address the need for more flexible generation. California Public Utility Commission has established a 50MW storage procurement mandate to meet local reliability needs in the Los Angeles area in the near term, and a mandate to reach 1325MW of storage procurement by the three investor-owned utilities by 2020. In addition, New York has committed \$23mm in funding for storage development, and the Canadian province of Ontario also plans to procure 50MW of storage capacity as an initial goal.

Sempra USGP supports a near term storage procurement goal to address current needs, and ongoing efforts by HECO and the Public Utilities Commission to establish a storage procurement plan to reach future incremental storage targets, as a prudent course of action. The incorporation of tax credit provisions will enhance the cost effectiveness of storage installations.



Statement of
Geoff Brown
Director, Business Development
BEACON POWER, LLC

Before the Senate Committee On Energy And Environment
March 11, 2014
2:45 PM
State Capitol, Conference Room 225

In consideration of
HB2618 HD2 RELATING TO ENERGY STORAGE

Chair Gabbard, Vice Chair Ruderman, and Members of the Committee on Energy and Environment

Comments:

Thank you for the opportunity to present the views of Beacon Power before the Hawaii Legislature. Beacon Power is a US based energy storage company that utilizes its proprietary carbon fiber composite flywheels to store and then recycle electrical energy on the transmission grid to help enable grid operators more accurately balance electricity supply and demand. Beacon Power has deployed its fast-responding and accurate storage devices in New York, New England and Pennsylvania. Our flywheel energy storage systems are particularly helpful to grid operators that are integrating high levels of variable generation renewable resources into their systems.

The strategic visions articulated by both the Governor and the CEO of Hawaiian Electric, designate renewable energy as one of the fundamental pillars of the Hawaii energy supply. As such, Hawaii will integrate very high levels of solar and wind power generation into the electricity system, likely at a higher percentage basis than any other state in the US. This integration will undoubtedly put Hawaii on the path to a more sustainable long term energy plan, one that enables it to attain its energy independence and achieve bold economic objectives, while also living up to its very high standards of environmental stewardship. However, this plan will require supporting infrastructure to ensure that Hawaii can achieve its objectives.

Although the fuel for renewable energy is free, there are direct and indirect capital costs needed to ensure its effective and efficient integration in the electric grid eco-system. The renewable energy generation output is variable; constantly changing based on wind patterns and cloud cover. In addition, renewable energy generation resources sometimes need to be sited remotely with the power being transmitted to locations where it will be consumed. For the host utility, this implies additional investment is needed for modernization of the transmission and distribution (T&D) systems for each new MW of renewable energy added to the system. Specifically, balancing real-time supply and demand becomes a significant challenge, but there are many technologies,



including energy storage and demand response, that utilities can use to address these issues. As a rule of thumb, we believe that for an additional cost of 1 to 2 c/kWh, supporting infrastructure can be installed to ensure renewable energy is seamlessly integrated into the grid.

As renewables are being added to the system across the US, the mainland utilities are addressing the same basic system integration issue as Hawaii. Importantly, FERC addressed the frequency regulation market required for the balancing of generation and load on the transmission systems of its jurisdictional independent system operators and regional transmission organizations in Orders 755 & 784. In these orders, FERC directed that the jurisdictional ISOs and RTOs create market rules to compensate participants in its ancillary services market for their provision of frequency regulation in a manner that reflects the regulation services actually provided by the market participant. This compensation structure encourages the integration of faster-responding and more accurate grid balancing tools, thus allowing the transmission system operators to be able to more accurately address the system balancing needs, including any variability introduced by the integration of high levels of renewable energy into their supply base.

The energy storage and demand side management systems are evolving at a rapid rate. Utility professionals and experts at the PUC must dedicate significant time and effort to stay on top of new technology capability and cost. Because this field is so dynamic, Beacon advocates empowering the subject matter experts at the utility companies and the PUC to take appropriate action to incorporate the best available technologies into their grid as needed. Single point in time energy storage legislation runs a far greater risk of distorting the market than enabling the utilities to make the best technology choice. It would be difficult or impractical to design legislation that could keep pace with the rate of change of the emerging technologies, or for that matter, the constantly changing dynamics on Hawaii's electric system. Legislative solutions also run the risk of delaying infrastructure program implementation, and given the rate of installation of renewable energy in Hawaii, the State needs a bias toward speed of execution of the necessary supporting infrastructure.

Despite the fact the system problems are arguably being created or exacerbated by the introduction of independently developed renewable power projects or customer-owned renewable energy, most utilities are concluding the problem is best solved via centralized solutions. A utility controlled centralized response enables the utilities to account for the spatial diversity benefits of having renewables geographically spread across the islands. This also enables utilities to optimize solutions through project hybridization and combination projects including transmission upgrades, demand response and energy storage. This overall system optimization should result in the lowest total cost and best response to system problems leading to highest reliability.

Placing control and ownership of the implementation of the renewable energy supporting infrastructure with the utility and PUC will help address the issue of cost. The utility is in the best position to determine how much and what type of energy storage is needed to reliably and safely meet Hawaii's renewable energy goals. The PUC and consumer advocate will be there to make sure the investments are prudent and balance the interests of all the stakeholders. The question of who should pay for this supporting infrastructure is often a hotly debated topic. Yet in the case of Hawaii, renewable energy implementation has clear and compelling strategic and societal benefits for the State, which means the cost should probably be borne all the beneficiaries. The utility



billing process has always been an effective and fair way to allocate those costs by adding a charge to customers' bills in proportion to their kWh of usage. It would be difficult to craft legislation that could as fairly allocate those costs.

Thank you again for allowing us to present our views. We very strongly recommend that Hawaii use all the emerging technologies, including energy storage, to help integrate renewable energy into its asset base. Whether the decision is to use the existing regulatory and utility system or implement new legislation, ultimately the program should have a bias for action to ensure renewables achieve their objectives while maintaining a reliable electrical system for the State.

TESTIMONY IN SUPPORT OF HB 2618, HD2
SENATE COMMITTEE ON ENERGY AND ENVIRONMENT
Tuesday, March 11, 2014 at 2:45p.m.
Conference Room 225

To: Chair Gabbard, Vice Chair Ruderman, and members of the Committee:

I support HB2618, HD2 and respectfully request that the Committee pass it.

I am a long-term land owner in Molokai. My husband and I bought land in Molokai, after falling in love with the natural beauty of the island, and hoping to retire there. I am also Director of Project Finance for the Princeton Energy Group, which is developing the proposed renewable energy project with energy storage technology (Ikehu Molokai). Princeton Energy Group has been developing innovative and challenging renewable energy projects since the 1990s.

Because of my day to day work, I stayed very interested in the development of the "Big Wind" project on Molokai. When Molokai Ranch decided not to lease its land to this project in February 2013, I went to Molokai almost immediately thereafter, to hear from as many residents as possible, what could be done on the island which would utilize the abundant renewable energy resources on the island, for the island's benefit. I also met with Molokai Ranch, the Maui Electric Company (Meco) and inspected possible project sites. It emerged that there is strong support on the island for solar power to power Molokai, and provided we can put in significant energy storage, Meco will be supportive.

Upon hearing my report, I was delighted that my CEO (Steve Taber) felt that taking on this challenging project in Molokai is in line with Princeton Energy Group's corporate mission and expertise, and that he will be willing to put in a lot of effort himself, to make the project happen. Steve and his Co-founder have indeed taken on many challenging projects, such as the first renewable energy project in Crete (an island grid) in Greece, in Turkey and in Mexico.

In developing Ikehu Molokai, a key challenge is the cost of energy storage. In order to be able to shift the day time generation from solar photovoltaic panels into night time use on Molokai, we will need a very large amount of energy storage capacity. We are looking at various energy storage technologies, ranging from pumped storage hydro, advanced flow batteries, solar thermal with molten salt storage, etc. They are capital intensive and expensive. However, advanced energy storage technologies are rapidly becoming fully operational, as witnessed at the first North American energy storage conference in San Jose (California) in September 2013. As utilities integrate more renewable energy resources, which are intermittent by nature, energy storage is becoming essential. The State of Hawaii can do its part, by enabling projects such as Ikehu Molokai, to integrate energy storage in renewable energy generation at a utility scale. Incentivizing energy storage will lead to significantly higher levels of renewable energy penetration in the State of Hawaii, as well as to a stable and reliable grid.

I respectfully request that this measure be passed out.
Thank you for the opportunity to testify.

Sincerely,

Kumiko Yoshinari, PhD, CFA

9 March 2014

HB2618

Submitted on: 3/7/2014

Testimony for ENE on Mar 11, 2014 14:45PM in Conference Room 225

| Submitted By | Organization | Testifier Position | Present at Hearing |
|---------------------|---------------------|-------------------------------|-------------------------------|
| Carl | Individual | Support | No |

Comments: Mahalo Senators and Reps for this bill. I am in full support of this bill. This needed to continue and enhance the development and installation of Solar PV throughout the islands and supports the achievement the goals set forth in HCEI.