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WRITTEN TESTIMONY

TESTIMONY BY KALBERT K. YOUNG
DIRECTOR, DEPARTMENT OF BUDGET AND FINANCE
STATE OF HAWAII
TO THE HOUSE COMMITTEE ON FINANCE
ON
HOUSE BILL NO. 1942, H.D. 1

February 19, 2014

RELATING TO THE ISSUANCE OF SPECIAL PURPOSE REVENUE BONDS TO ASSIST WITH THE PLANNING, DESIGN, CONSTRUCTION, EQUIPPING, LAND LEASES, AND OTHER TANIGIBLE ASSETS FOR A RENEWABLE ENERGY PROJECT WITH ENERGY STORAGE TECHNOLOGY ON THE ISLAND OF MOLOKAI

House Bill No. 1942, H.D. 1, authorizes the issuance of special purpose revenue bonds (SPRB) to assist Princeton Energy Group or a related special purpose entity with the financing of the planning, design, and construction of a renewable energy project with energy storage technology on the island of Molokai pursuant to Part V, Chapter 39A, Hawaii Revised Statutes.

The Department would like to advise the Legislature and prospective issuers that should the legislation be approved, approval of SPRB issuance will still require further discussion and satisfactory review of the financing components involved in the transaction.

Thank you for the opportunity to provide testimony on this measure.

PRINCETON ENERGY GROUP

Innovation in Renewable Energy

STEVE TABER
Chairman and CEO

PRINCETON ENERGY GROUP'S
TESTIMONY IN SUPPORT OF HB 1942, HD1

HOUSE COMMITTEE ON FINANCE
Wednesday, February 19, 2014 at 10a.m.
Conference Room 308

Good morning Chair Luke, Vice Chairs Nishimoto and Johanson, and members of the Committee:

Princeton Energy Group ("Princeton") supports HB1942, HD1 and respectfully requests that the Committee pass it out.

We are currently engaged in the Ikehu Molokai Project. This is the project described in HB 1942, HD1 as the "multi-megawatt renewable energy project with energy storage technology near Kaunakakai to exclusively serve the island of Molokai". 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 response to the PUC's "No Regrets" policy, we have analyzed the full range of renewable energy technologies to arrive at the most cost-effective project design. The technologies we have analyzed include solar photovoltaics, dispatchable solar thermal energy, utility-scale wind turbines, small-scale wind turbines, direct combustion biomass and waste to energy, gasified biomass and waste to energy, vanadium flow batteries, iron-chromium batteries, pumped storage hydroelectric, smart grid technologies, end use efficiency, and other technologies. We have also looked briefly at geothermal energy but rejected it because the

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geothermal resource on Molokai is poor, and we have looked at high-energy-density batteries but rejected them because of the fire risk.

The first phase of the project is projected to get the island to 50% or more renewable penetration, using photovoltaic generation, coupled with end use energy efficiency measures. In addition to the solar generation, we will install a robust storage resource. We had originally planned a pumped storage hydroelectric resource, located near Manila Camp in Kaunakakai, but in response to concerns voiced by residents of Manila Camp, we are also investigating a quieter storage technology, flow batteries, and a relocation of the equipment to the industrial park, remote from residential areas. The storage equipment, whether batteries or pumped storage, will keep the grid stable as more residents install rooftop PV panels, so the Ikehu project will support the build out of the maximum possible behind-the-meter, rooftop photovoltaic generation. Also, by stabilizing the grid, the storage resource will greatly reduce the frequent blackouts and brownouts that plague Molokai. Finally, it will enable MECo to shift the load-following function from the existing diesel generators to the storage equipment. This will extend the life of the diesel generators and eliminate part-load inefficiencies in fuel consumption. The second phase of the project, which has not yet been designed, will aim to get the island to 100% renewables.

We are committed to shaping the Ikehu Molokai project in response to the concerns of the island's residents. We have held a dozen or so meetings with community groups on Molokai, meeting with hundreds of the island's residents. We will continue with these meetings throughout the development period. The residents have raised numerous issues, including noise from generating equipment, visual impact from wind turbines, traffic, impact on water resources, etc. The residents have also offered many valuable suggestions about how to shape the project better. We have are working to adjust the mix of technologies, the location of the project, and other factors in response to concerns voiced by the community. We expect to have the support of a strong majority of Molokai's residents solidified within the next 60 to 90 days, following the next round of meetings to be held on the island in February-March.

The economic impact of the SPRB allocation for the Ikehu Molokai project will be strongly positive. We expect the project to 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 competitive, which will also stimulate economic activity.

HB1942, HD1 is vitally important to the success of the Ikehu Molokai project. The high degree of renewable penetration called for by the project requires a large capital expense, including a robust energy storage component. Energy storage has been implemented with renewable projects on other islands, but in much smaller increments than will be required for Molokai. The capital expense for the Ikehu Molokai project is quite high on a $/MW basis. We can overcome the high capital expense with the benefit of long-term financing at reasonable interest rates, which the SPRBs authorized by HB 1942,HD1 will provide. To further this

process, we are in discussions with B&F and with DBEDT and have submitted the exhibits required for their consideration of the SPRB, including our business plan and financial models.

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.

17 February 2014

MOLOKA'I RANCH
Treasured heritage. Vibrant future.

TESTIMONY IN SUPPORT OF HB 1942, HD1 (HSCR 396-14)
HOUSE OF REPRESENTATIVE COMMITTEE ON FINANCE

Wednesday, February 19, 2014 at 10:00 am, Conf. Room 308

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

Goodmorning & Aloha Chair Luke, Vice Chairs Nishimoto & Johanson, and Committee Members

Molokai Ranch strongly supports HB 1942. HD1. Molokai has one of the highest electricity rates in Hawaii, ranging from $0.48 to $0.52 per kwh. This bill will greatly assist Princeton Energy Group to implement "Ikehu Molokai".

The primary goal of "Ikehu Molokai" is to incorporate 100% renewable energy and transition Molokai off fossil fuel. Coupled with the existing federal and state tax credits, this proposed bill will provide meaningful rate relief for the residents and businesses of Molokai. In addition, renewable energy coupled with energy storage, will stabilize the electrical grid, decrease Molokai carbon footprint, and help the State meet the mandates for renewable energy.

Molokai Ranch owns and operates 3 utility companies, highly dependent on electricity, almost 24 hours/day. HB 1942, HD1 will result in cost savings, that may result in higher additional employees or cost savings to the water ratepayers.

Therefore, we respectfully request that HB 1942,HD1 be passed out of committee.

Mahalo,

Clay R. Rumbaoa

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1003 Bishop Street • Suite 1170 • Honolulu, Hawaii 96813
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Molokai
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TESTIMONY/PETITION IN SUPPORT OF HB1942, HD1

COMMITTEE ON FINANCE
February 19, 2014 at 10a.m. in Room 308

Honorable Committee Chair Luke, Chairs Nishimoto and Johanson, and Committee Members:

We are residents of Molokai and we fully support H**B1942, HD1** because we care about the future of our island. This bill will enable the Ikehu Molokai project to issue special purpose revenue bonds through the State of Hawaii.

Ikehu Molokai aims to convert the island to 100% renewable energy and in that process to reduce and stabilize Molokai's extremely high electricity rates. We know that the Molokai electrical grid is very small, and thus it is hard to attract investors and financing to this project because it will not be very profitable. Therefore, the State of Hawaii should do everything in its power to facilitate the financing of this project. What happens in Molokai can be replicated elsewhere in Hawaii and beyond. It is well worth the effort of our legislators to pass this bill.

Respectfully,

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[signature]	P.O. Box 41 Hoolehua, HI 96729
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ulupono INITIATIVE

HOUSE COMMITTEE ON FINANCE
Wednesday, February 19, 2014 – 10:00 a.m. – Room 308

Ulupono Initiative Strongly Supports of HB 1942 HD 1, Relating to the Issuance of Special Purpose Revenue Bonds to assist with the Planning, Design, Construction, Equipping, Land Leases, and other Tangible Assets for a Renewable Energy Project with Energy Storage Technology on the Island of Molokai

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 1942 HD 1, which authorizes the issuance of special purpose revenue bonds to assist Princeton Energy Group. Ulupono would like to see as much renewable energy production as possible. However, the electrical grid can only handle a finite amount of intermittent renewable energy production sources such as solar and wind. As intermittent power is reaching its cap on Molokai, a feasible solution is energy storage. If energy storage projects were successfully developed, there would be increased grid reliability and resilience. Therefore, more local renewable energy can be generated on Molokai to offset imported fossil fuel based energy generation. Energy storage projects would greatly benefit the residents of Molokai.

Ulupono is looking to invest in energy storage projects as we believe they could make a significant difference in helping Hawai'i reduce its dependence on fossil fuels.

Thank you for this opportunity to testify.

Respectfully,

Murray Clay
Managing Partner

Email: communications@ulupono.com

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EnerVault

ENERVAULT'S
TESTIMONY IN SUPPORT OF HB 1942, HD1

HOUSE FINANCE COMMITTEE

Good morning Chair Luke, Vice Chairs Nishimoto and Johanson, and members of the Committee:

ENERVAULT supports HB1942, HD1 and respectfully requests that the Committee pass it out without a defective date.

EnerVault designs and manufactures long-duration, grid-scale energy storage systems based on iron-chromium redox flow battery technology first pioneered by NASA. EnerVault's energy storage systems both absorb and deliver energy into the grid cost effectively to manage grid efficiency, improve reliability, and integrate variable renewable energy resources. Based in the Silicon Valley, EnerVault is the first company to deploy megawatt-hour scale iron-chromium flow battery systems in field operations. For more information, visit www.EnerVault.com

We are currently considering a role in the integration of a multi-hour, safe, reliable and cost effective energy storage system to support a high penetration of renewable resources in the Ikehu Molokai project, being developed by Princeton Energy Group. This is the project described in HB 1942, HD1 as the "multi-megawatt renewable energy project with energy storage technology near Kaunakakai to exclusively serve the island of Molokai". 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 is an exciting project for us and one of which the island will receive both national and international recognition in demonstrating the realizable goal, of cost effective, clean energy.

HB1942, HD1 is vitally important to the success of the Ikehu Molokai project. The high degree of renewable penetration called for by the project requires a large capital expense, including a robust energy storage component. The capital expense for the Ikehu Molokai project is quite high on a $/MW basis. The high capital expense can be ameliorated with the benefit of long-term financing at reasonable interest rates, which the SPRBs authorized by HB 1942, HD1 will provide.

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

Thank you for the opportunity to testify.

Sincerely,

Craig R. Horne, Ph.D.
Chief Strategy Officer & Co-Founder
EnerVault

18 February 2014

ROYAL CONTRACTING COMPANY'S
TESTIMONY IN SUPPORT OF HB 1942

HOUSE FINANCE COMMITTEE

Good afternoon Chair Sylvia Luke, Vice Chair Aaron Ling Johanson, and members of the Committee:

Royal Contracting Co. supports HB1942 and respectfully requests that the Committee pass it out.

Royal Contracting was established in 1961, and has been constructing projects in Hawaii for the past 51 years. We are a general engineering, and site work contractor that has successfully completed projects on all of the major islands, including Molokai.

We are currently considering a role in the Ikehu Molokai project being developed by Princeton Energy Group for the benefit of the residents and businesses on Molokai. This is the project described in HB 1942 as the "multi-megawatt renewable energy project with energy storage technology near Kaunakakai to exclusively serve the island of Molokai". 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 is an exciting project for us and one of which the island and the state will be very proud.

HB1942 is vitally important to the success of the Ikehu Molokai project. The high degree of renewable penetration called for by the project requires a large capital expense, including a robust energy storage component. The capital expense for the Ikehu Molokai project is quite high on a $/MW basis. The high capital expense can be ameliorated with the benefit of long-term financing at reasonable interest rates, which the SPRBs authorized by HB 1942 will provide.

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

Thank you for the opportunity to submit our written testimony.

Sincerely,

Roland Au

Roland Au

Project Engineer

Royal Contracting Company, Ltd.

18 February 2014

TESTIMONY IN SUPPORT OF HB 1942, HD1

HOUSE COMMITTEE ON FINANCE

February 19, 2014 at 10a.m. in Room 308

Good morning Chair Luke, Vice Chairs Nishimoto and Johanson, and members of the Committee:

I support HB1942, HD1 and request that the Committee pass it without a defective date.

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.

Since my area of expertise and responsibility is project finance, after a 25 year career in structuring finance for numerous infrastructure and other projects, I am keenly aware that Ikehu Molokai needs access to favorable finance, in order to make the project happen. The load on Molokai is very small, yet the project needs a lot of expensive capital equipment, for both solar power generation and energy storage. It is thus critical that the State of Hawaii authorize issuance of special purpose revenue bonds (SPRBs) to help fund this project. SPRBs will bring in long-term funds at a reasonable cost to Ikehu Molokai.

Therefore, I request that this measure be passed out without a defective date.

Thank you for the opportunity to testify.

Kumiko Yoshinari, PhD, CFA

Michael Mangana's Testimony in Support of HB 1942, HD1

House's Committee on Finance, February 19, 2014 at 10a.m.

Aloha Chair Luke, Vice Chairs Nishimoto and Johanson, and members of the Committee,

As you all may know, the Hawaii Legislative session began a few weeks ago. On the agenda this year is a bill that will impact the Ikehu Molokai project, and could lower the cost of electricity for Molokai residents. The bill is HB1942, HD1 which sets aside Special Purpose Revenue Bonds (SPRBs) for the Ikehu project, bringing down the cost to finance its initial construction.

HB 1942, HD1, if passed, will reduce the cost of generating electricity on Molokai for the Ikehu project. As stated by MECo, reduced generation costs will be passed on to the consumer. I support HB 1942, HD1 and hope you will as well.

Mahalo for all your efforts to promote renewable energy and reduced electricity rates on Molokai.

Mike Mangana

P.O. BOX 1980

KAUNAKAKAI, MOLOKAI, HAWAII 96748

Michael Mangana [mailto:michaelmangana@citlink.net]

February 18, 2014

TO: Chair Sylvia Luke, Vice Chair Aaron Ling Johanson, and members of the Committee

SUBJCT: House Finance Committee on Energy and Environment

RE: Testimony in Support of HB1942

Dear Chair Luke, Vice Chair Johanson, and members of the Committee:

As a Citizen of Hawaii who has visited and worked on Molokai. I am in support of HB1942.

HB1942 will help the residents of Molokai achieve a more reliable and less expensive source of electricity.

The population of Molokai is small therefore the help of all Hawaii residents is needed to help fund this renewable energy project.

The benefits as mentioned on HB1942 will help the people on Molokai to maintain their style of life and allow for more growth to help future generations to remain on Molokai.

Sincerely,

Leonard K.P. Leong