

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

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Statement of  
**LUIS P. SALAVERIA**  
Director  
Department of Business, Economic Development and Tourism  
before the  
**HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION**  
Tuesday, March 20, 2018  
9:00am  
State Capitol, Conference Room 325

in consideration of  
**HCR55/HR42**  
**REQUESTING THE DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT,  
AND TOURISM TO CONDUCT A STUDY ON THE ABILITY OF USING WAVE  
ENERGY PRODUCTION TO MEET THE STATE'S RENEWABLE ENERGY GOALS.**

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

The Department of Business, Economic Development & Tourism (DBEDT) offers comments on HCR55/HR42, which requests that the DBEDT conduct a study on the ability of using wave energy production to meet the State's renewable energy goals. DBEDT is also to submit a study to the Legislature no later than 20 days prior to the convening of the Regular Session of 2019.

As defined by Hawaii Revised Statutes Section 269-91, wave energy is included in the definition of renewable energy. Hence, any generation of wave energy for electricity sales would contribute towards our State's goal of 100% Renewable Portfolio Standards by 2045.

The U.S. Navy has partnered with the Hawaii National Marine Renewable Energy Center (HINMREC) at the University of Hawaii-Manoa, one of three federally-funded centers for marine energy research and development in the nation, to establish a multiple-berth wave energy test site (WETS) at Kaneohe Bay, Oahu. The purpose of the WETS is to collect and analyze wave buoy equipment performance (grid-connected), cost, and durability (which will help guide industry design improvements), as well as monitor environmental impacts from wave energy technologies (EMF, sediment, ecology). We understand that wave energy systems testing is still underway. Hence, we believe it is premature for DBEDT to conduct an additional wave energy study as is contemplated by HCR55/HR42.

Furthermore, DBEDT does not have the resources to conduct the study suggested by these resolutions. Should the Legislature opt to move forward with these resolutions, we hope consideration will be paid to the ongoing resource needs such a study would require which currently fall outside of our proposed Executive Budget.

Thank you for the opportunity to offer comments on HCR55/HR42.

**HCR-55**

Submitted on: 3/19/2018 8:47:54 AM

Testimony for EEP on 3/20/2018 9:00:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Melodie Aduja	OCC Legislative Priorities Committee, Democratic Party of Hawai'i	Support	No

Comments:

**HCR-55**

Submitted on: 3/18/2018 7:36:45 AM

Testimony for EEP on 3/20/2018 9:00:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Henry Curtis	Life of the Land	Comments	No

Comments:

Each Hawai'i Island has enough waves to meet all of its energy needs. Numerous studies have already been conducted. The issues are cost, impacts, and technology. have been studied. What is needed is technological breakthroughs

**Environmental Caucus**  
of the Democratic Party of Hawai'i

March 19, 2018

**LATE**

To: House Committee on Energy and Environmental Protection  
Rep. Chris Lee, Chair  
Rep. Nicole E. Lowen, Vice Chair

Re: HCR 55, HR 44 – Requesting DBEDT to Study Wave Energy to Meet State  
Energy Goals

Hearing: Tuesday, March 20, 2018, 9:00 a.m. Room 325

Position: SUPPORT – with proposed amendments

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

The Environmental Caucus of the Democratic Party of Hawai'i is in strong support of HCR 55 and HR 44, but urges that the Committee add appropriate amendments to ask DBEDT to study and report on the effects of energy-generating devices in the marine environment on marine life.

This is a very important proposal, and it deserves very serious consideration. Thank you very much for the opportunity to testify in its favor.

Alan B. Burdick, Chair  
Environmental Caucus  
[Burdick808@gmail.com](mailto:Burdick808@gmail.com)/ 486-1018

**LATE**

**HCR-55**

Submitted on: 3/19/2018 3:32:41 PM  
Testimony for EEP on 3/20/2018 9:00:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Erica Scott	Individual	Support	No

Comments:

Kindly request that you amend HCR55 to include in the study the effects that wave energy would have on the environment and more specifically on marine life. This is critically important given that we are an island community and the ocean serves us in many ways.

Here is an article published by the University of Oregon that makes my point:

<http://nnmrec.oregonstate.edu/education/effects-environment>

# Effects on the Environment

## Effects on the Environment



Wave energy devices may exert a range of effects on the environment, not all of which will necessarily lead to relevant or negative changes in the marine environment. The deployment of wave energy devices can effect the environment in which they are sited primarily in two ways:

- Wave energy devices will remove energy from the ocean, making less available for natural processes at the site.
- Wave energy arrays will introduce many large, hard structures, creating new and different habitat types.

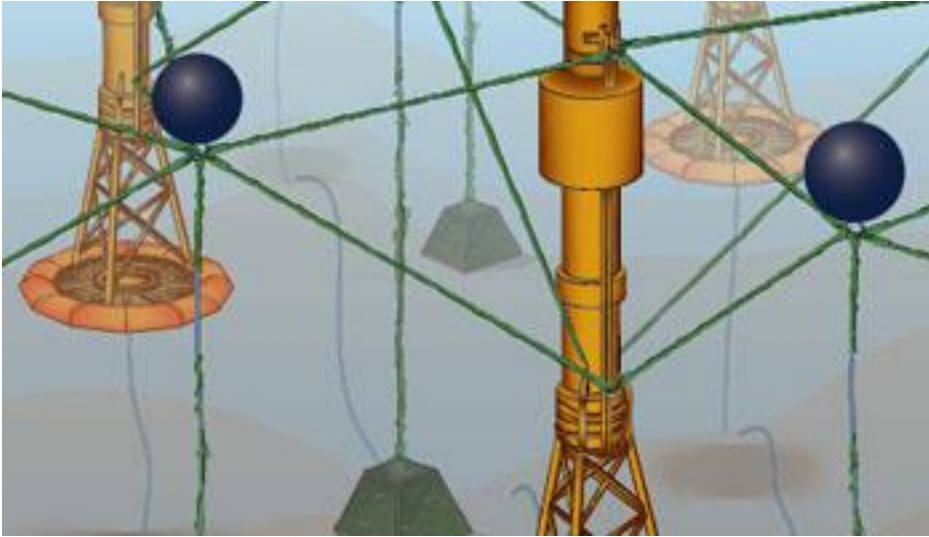
## Extracting Ocean Energy

Reductions in near shore ocean energy may change current patterns and water mixing, potentially affecting organisms by altering food delivery patterns or rates, the mixing of eggs and sperm, the dispersal of spores and/or larvae, and how temperature varies throughout the water column. Changes in water movement also can affect how sand is moved along the coast. Because sediment grain size often determines which animals can live in the sand, changes to sand movement may affect the distribution of organisms. These wave, current and sediment transport effects will be technology- and location-specific. Modeling of the Oregon coast by potential device developers concluded that their project would have an undetectable effect on erosion/accretion at the shoreline. The Strategic Environmental Analysis by the Scottish Executive concluded there would be only minor effects of a wave energy array but recommended appropriate local analysis.

### **Introducing New Habitat**

The second effects to consider are those that arise simply from having a device in the water. Because these devices are large and likely to be deployed in large groups, their presence may alter current flows, having effects similar to those described above. The effects of structures can further be divided into localized effects and those on migratory species:



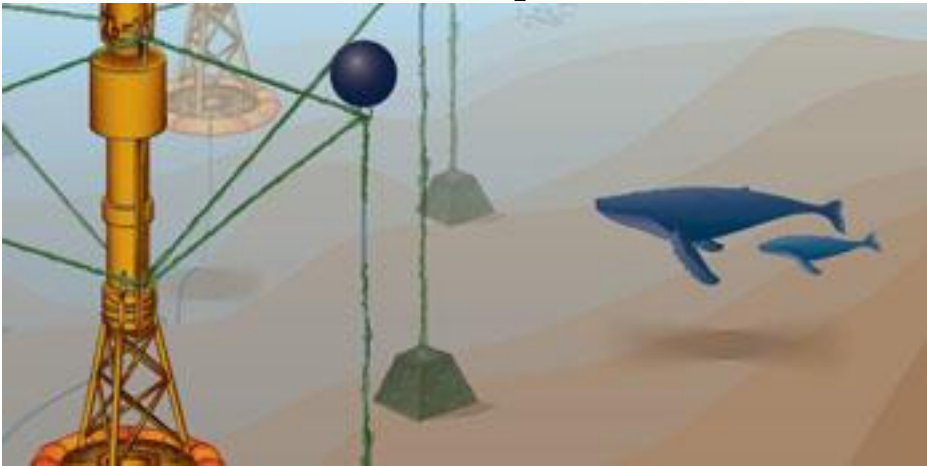


**A. Local effects due to the introduction of artificial hard substrate on fish and benthos:**

Typically, these devices will be located in sandy bottom habitats with little vertical structure. The devices will introduce a large amount of hard material (buoys and anchors) and cables, which may be colonized by a variety of organisms, including non-native species. Further, structures with vertical relief may attract a variety of fish species typically associated with reefs. The fishes, invertebrates, and seaweeds that colonize hard structures will be different than those typically found in sandy habitats; thus, a new biological community will be present in the area. This may result in novel food or novel predators for the resident, soft-bottom organisms. Minor changes in species associated with softer sediments could occur due to scouring around the anchors.

Opinions differ as to whether these effects (e.g., bringing in species using hard substrates in areas of mainly soft substrate seabed) will be positive or negative. The described re-population of hard substrates may be considered to be a positive effect (performing like an artificial reef). Conversely,

the intrusion of hard substrate in soft bottom areas may be considered a negative effect that may lead to “alienation” of species. Introduction of new species can be regarded as positive if increasing local biodiversity or biomass production is a goal. In conservation areas, habitat changes leading to “alienation of species composition” is considered undesirable and as species could displace the original species. Finally, if fishing is prohibited in the arrays, they may serve as de facto marine protected areas, possibly having positive effects on overall stocks of harvested species.



**B. Effects on migratory species and marine mammals:**

Larger and migratory species may be at risk for entanglement in cables associated with the structures. Avoidance of these areas could result in longer migration times for certain species. Noise from the devices may affect navigation and communication of marine mammals and may cause other organisms to avoid or be attracted to the area; however, it is not yet known if noise from the devices will be significantly louder or more frequent than that from vessel traffic. Studies are currently underway to assess ambient noise on the Oregon shelf and that associated with wave energy devices.

Magnetic and induced electric fields may affect navigation of salmon, crabs, some fishes and elasmobranches (sharks and rays).

Lighting of the surface elements of the devices may affect sea birds in that they may be attracted to the area, avoid the area, or be confused about their location relative to shore.

Avoidance of the area may result in longer migration or forage times. However, the lighting may help prevent any potential sea bird collisions with the devices. Research is underway investigating the different effects of white versus red and flashing versus constant lights on offshore wind turbines. The findings of those studies may be helpful in informing designs for lighting wave energy devices.