



University of Hawai'i at Mānoa

Hawai'i Natural Energy Institute

School of Ocean & Earth Science & Technology

Hawai'i National Marine Renewable Energy Center

The Hawai'i National Marine Renewable Energy Center (HINMREC) was established to facilitate commercialization of Wave Energy Conversion (WEC) devices and to accelerate development and testing of Ocean Thermal Energy Conversion (OTEC) technologies.

With Hawai'i so dependent on fossil fuels, it would seem sensible to consider marine renewable energy resources as an alternative. OTEC and WEC devices, moored nearshore, could provide electricity, via submarine power cables, to land stations. Grazing OTEC plants could generate an energy-intensive product like ammonia or hydrogen to be used as the fuel of the future.

OTEC resources, for example, could be used to generate all energy required by humanity. What is needed is a determination of costs and the global environmental impact. This can only be accomplished by deploying and monitoring operations with the first generation of OTEC plants.

In Hawai'i, OTEC electricity could supply all of the state's yearly electricity demands, including that required for large fleets of electric vehicles. All domestic water needs can also be satisfied with desalinated water from OTEC systems. In an annual basis, wave energy conversion (WEC) devices could generate about 30% of the electricity presently consumed in the State.

Our challenges as facilitators are:

- No current first-generation WEC system that would be cost competitive in Hawai'i;
- How to overcome the lack of consistent funding that is required for industry to proceed from concept design to the required pre-commercial demonstration phase;
- How to obtain funding for the OTEC Pilot Plant;
- How to hasten the process of obtaining licenses/permits including the necessary Environmental Impact Statement (EIS). The process is expensive and requires about 3-years for such projects
- Industry timelines are not always consistent with HINMREC objectives;
- Industry plans subject to vagaries of funding.

WEC and OTEC commercialization is challenged by high capital investments balanced by the expected but yet-to-be-demonstrated low operational costs. Lessons can be learned from the successful commercialization of wind energy and applied to WEC and OTEC commercialization. By commercialization we mean that equipment can be financed under terms that yield cost-competitive electricity, depending on specific site conditions.

Luis Vega

Specialist

Hawai'i Natural Energy Institute

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