Another Milestone For US Wave Energy. #ThanksObama!

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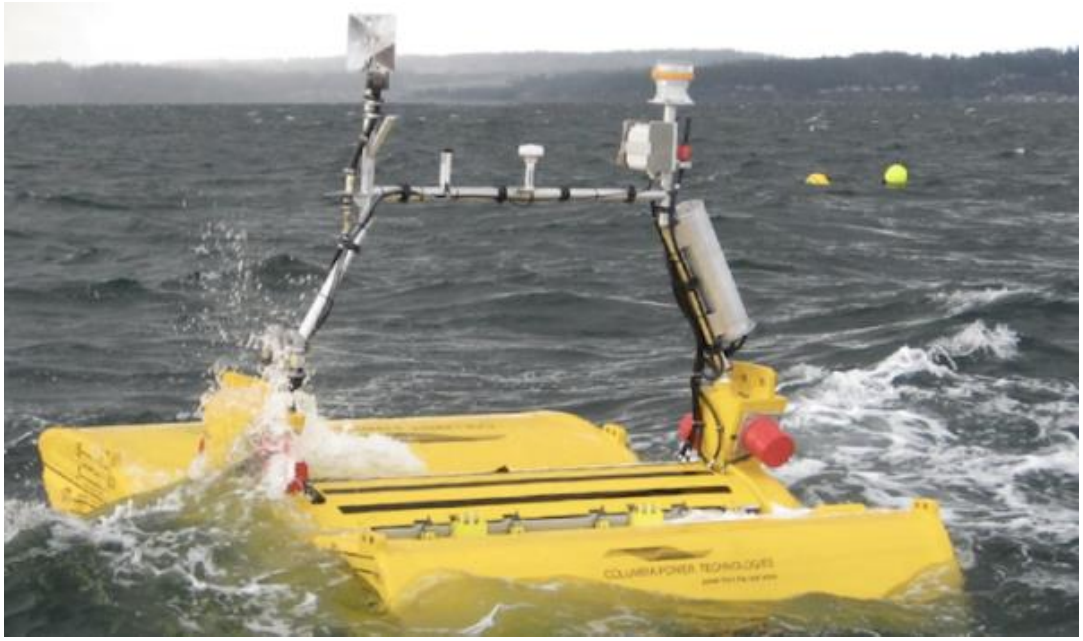


by **Tina Casey**

Clean, renewable wave energy has been sloshing up against the shores of North America for millennia, only to disappear into the ether, and it looks like the US is finally going to grab some back. A US wave energy startup called Columbia Power Technologies has just received a statement of feasibility for its new StingRay wave energy converter design, enabling it to pass a critical milestone on the way to commercial production.

The StingRay project is being co-sponsored by the US Departments of Energy and the Navy, so #thanksobama!

The StingRAY Wave Energy Converter

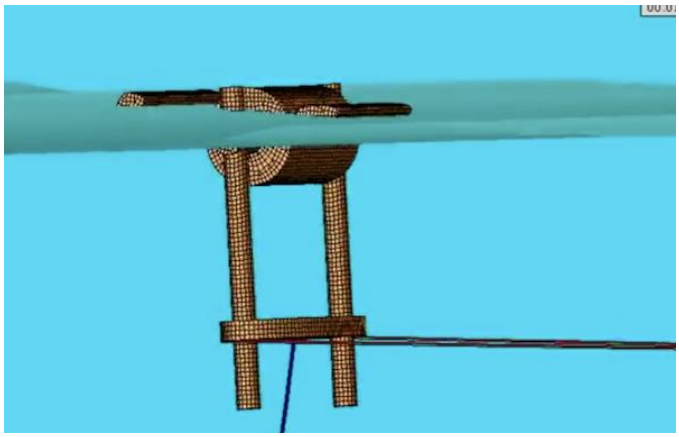
The StingRAY wave energy project crossed over the *CleanTechnica* radar back in 2014, when we noticed that the US Navy had shelled out $3 million to get the device under way with the lofty goal of achieving utility scale clean power production.

If the project bears fruit, the StingRAY would provide the US with a critical offshore clean power option in locations where the aesthetics of tall wind turbine towers limit site selection. The

StingRAY is designed with a low profile that limits visibility from a distance down to practically nothing:

Nifty, right? The bulk of the device is under water:

As described by Columbia Power, the "float" and "spar" parts of the device each react differently to the shape of passing waves and swells:



At a high level, the StingRAY captures energy from each passing wave and produces electricity on-board the device. The electricity generation process includes a series of steps starting with the transfer of captured energy from the forward and aft floats to two rotary, low-speed, high-torque electric generators on board the StingRAY. The generated power is then conditioned to stable, electric-grid-compatible output. In a wave farm, this electricity is centrally collected in an offshore "sub-station" for transmission ashore and connection to the grid.

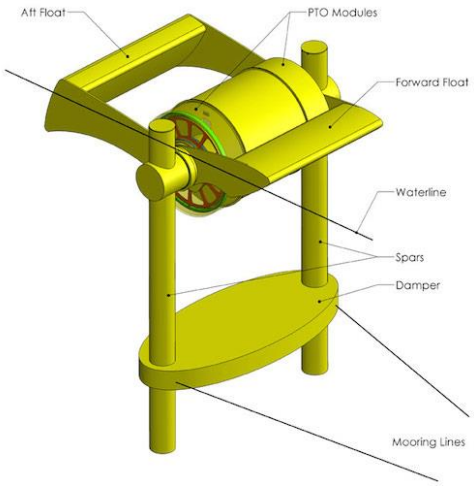
The "high level" thing is important because the higher you go, the more differential you'll get, and that potentially yields greater efficiency.

Ocean Power Challenges

On the other hand, having part of your device floating on the surface can expose it to storm damage. *CleanTechnica* has covered other wave energy designs that are anchored entirely under water to catch the motion of sub-surface swells, so it will be interesting to see how the different approaches compare when the real world data and ocean environment impacts start to accumulate.

If the Columbia technology sounds fairly straightforward, it is, but doing anything in the ocean is a huge challenge. Part of the challenge is protecting the equipment from stormy weather, as mentioned above. Another huge issue is protecting submerged equipment from water damage, especially corrosive ocean saltwater.

For corrosion resistance, Columbia relies heavily on fiberglass, which has a proven track record in the ocean environment. Here's a schematic that shows how the floats are positioned relative to the on-board generator:



Giant Step For US Wave Energy

The new feasibility statement gives the green light for Columbia to move forward with the development of a fully installed wave energy prototype.

The statement was issued by the global clean power certification body DNV GL, which apparently has issued very few such statements for wave energy converters so far. DNV GL takes a risk-based approach that helps to drive commercial investment:

…The organisation has been assessing new technologies and publishing standards and guidelines to ensure components, technologies and projects are reliable, safe and commercially profitable, with all risks mitigated. The risk-based focus is also invaluable for offshore wind and wave and tidal projects, which are pushing the boundaries of technical and engineering knowledge and capabilities. As well as those, which require reliable operation and effective risk management at all times.

DNV GL can trace its roots back to 1864, btw.

#thanksobama For More Water Power

If wave energy takes off in the US, taxpayers can go ahead and give themselves a big group hug. Back in 2012 the Energy Department upgraded its WETS (Wave Energy Test Site) facility, a shared public-private ocean energy test bed in Hawaii, and since then it has pumped millions into wave energy systems testing.

Aside from support for ocean-going clean power systems like the StingRAY, the Obama Administration has also been pursuing a raft of technology solutions for drawing more power from inland waterways without building additional hydropower dams.

A recent round of $10.5 million in Energy Department funding, for example, went to water turbines designed to capture energy from river currents and tidal currents.

The Obama Administration also leveraged the 2009 Recovery Act to upgrade seven hydropower dams for increased electricity generation, in a program designed to demonstrate more power can be harvested from the nation's existing 2,400 hydro facilities.

Another marker of support for inland water energy harvesting was the establishment of the Riversphere research center at Tulane University, which includes a shared test bed similar to that of the WETS facility, with the help of $3 million in federal funding.

On a related note, our sister site *PlanetSave* recently spotlighted a startup that has leveraged an Energy Department grant to arrange private financing to develop a system for harvesting energy from a municipal water supply system.

The cool thing about this project is that the city — Portland, Oregon to be specific — pays no money up front. As with a typical solar power purchase agreement, the company will lay down new energy-equipped pipes on its own dime and the city will pay only for the electricity generated by the system. If the arrangement works out, that would provide many older cities with an affordable way to upgrade their aging water systems, so stay tuned.