Hydraulic Seafloor Carpet Could Harness the Energy of Ocean Waves

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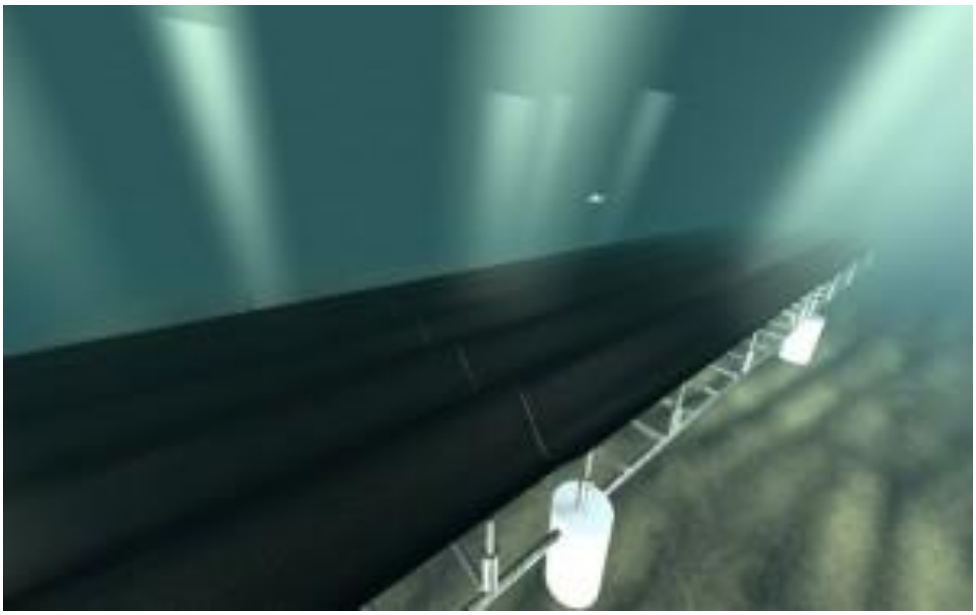

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In the quest for another renewable energy source that can potentially provide a constant source of carbon-free power, researchers at UC Berkeley are working on extracting the energy of ocean waves, and looking to use a hydraulic seafloor 'carpet' to harvest and convert it to usable energy. After all, the sun goes down, and the winds die, but the waves just keep coming, so ocean energy could be a feasible option for clean renewable energy in areas near the coast.

Reza Alam, an assistant professor at UC Berkeley and an expert in wave mechanics, is working on a wave-to-energy 'carpet' that uses a thin sheet of rubber on the seafloor, sitting on top of a system of hydraulic actuators, which are then pumped by using the motion of the carpet in the waves. The resulting hydraulic pressure is piped to shore for conversion to usable energy, allowing for the harvesting of power from the ocean with minimal visual and physical impact on both sea life and boats on the surface.

> "There is a vast amount of untapped energy in the oceans, and with increasing worldwide demand for power, the need to find cleaner alternatives to fossil fuels is critical. We are also seeing greater population growth along coastal cities, so the ocean-based system we are developing would produce electricity in a carbon-neutral way right where it is needed." - Alam

Alam says he got his idea for a seafloor carpet from the mechanics of muddy seabeds, which naturally dampen the energy from surface waves, and that this system could take advantage of areas which are normally not usable for recreation or fishing. The team is looking to locate the system in shallow coastal waters, about 60 feet deep, and is investigating the use of nearshore dead zones for a pilot project.

According to Berkeley, early wave tank experiments with the seafloor carpet system found that it was able to absorb over 90% of the incoming wave energy, and that not only was the system able to operate successfully in stormy conditions, but was found to be "even more efficient when ocean waves are stronger."

Currently, Alam and the engineering team at UC Berkeley is using crowdfunding to develop their new Wave Energy Converter, with a campaign on Experiment.com (formerly Microryza). The campaign seeks to raise about $10,000 to fully proof the functionality of a pilot system in the ocean (which is planned for launch in 2016 at the Northwest National Marine Renewable Energy Center in Newport, Oregon.) Derek Markham