
Department of Energy

Navy Catching Waves in Hawaii

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This experimental power-generating buoy installed off the coast of Oahu can produce enough energy to power 25 homes under optimal conditions. | Photo courtesy of Ocean Power Technologies, Inc.

To a casual observer, the buoy off the shore of [Marine Corps Base Hawaii \(MCBH\)](#) might look like nothing more than a bright yellow spot in a blue ocean. But this isn't an ordinary buoy – it's a small electrical generator, [creating renewable electricity as it bobs up and down on the waves](#). It's also a test project by the U.S. Navy to see whether a wider use of wave energy technology is a practical way to power Navy and Marine Corps installations.

Brian Cable is a mechanical engineer and project manager for the [Naval Facilities Engineering Command's](#) Wave Energy Technology project. He says the power-generating buoy is just one of several devices the Navy is testing with the hope of moving toward more use of alternative energy.

"We're really trying to help the Navy meet its energy goals, which are to reduce dependence on fossil fuels. The Navy's target goal is to utilize half of our total energy consumption, ashore and afloat from alternate energy sources by 2020," Cable says.

Wave power is generated by the up-and-down motion of ocean waves, which the Hawaiian buoy captures with a plunger connected to a hydraulic pump. That pump powers a generator that creates electricity, and the electricity can then be sent to shore through an underwater cable.

For this experiment, the Navy partnered with [Ocean Power Technologies, Inc.](#), which designed and deployed the buoy last December. After it's connected to the shore with an undersea cable, which Cable says was scheduled for early May, the power it generates can be connected to MCBH. Under the right conditions, the single buoy has the capacity to generate enough electricity to power 20 to 25 homes a year. The existing ocean test is scheduled to be completed by autumn.

Cable says there are two potential applications for this type of wave energy. The main goal is to power onshore military installations like MCBH and the larger onshore power grid. The other potential application would be to power autonomous systems with smaller power needs, such as a scientific data collection points in the middle of the ocean.

At the moment, Cable notes, wave energy is struggling to be cost-competitive with conventional utilities – even in Hawaii, where power is expensive. But engineers are hoping to change that by refining the technology through experiments such as this.

"Until they're actually tested and shown to be reliable in the ocean, the story isn't complete," he says. "So that's what we're doing right now."

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