

Wave Energy in Hawaii

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A Superior Location for Wave Energy

The State of Hawaii has one of the world's best and most consistent wave regimes. Combined with the islands' high electricity prices, heavy reliance on imported oil, and government policies promoting renewable energy, this makes Hawaii a natural location for wave energy research, development and demonstration.

According to a study completed in 1992, the annual wave energy resource off the northern shores of the Hawaiian Islands far exceeds the electricity demand of all but one of the major islands. The exception is Oahu, which has a large population and high electricity demand which is comparable to two-thirds of the available wave energy resource. See a pdf at: <http://www.hawaii.gov/dbedt/info/energy/renewable/wave>.

A 2004 assessment by E2I/EPRI also acknowledged Hawaii's superior wave energy resource. The wave power density along the 80-meter depth contour typically averages 10 to 15 kW/m in waters not sheltered by headlands.

Policies Encourage Wave Technology

The State of Hawaii has adopted a Renewable Portfolio Standard that calls for 20% of the islands' electricity to be generated from renewable resources by the year 2020. Wave power is among the technologies that can contribute to the goal of reduced dependence on imported oil.

A State tax credit is allowed under HRS Chapter 235 for investment in "qualified high technology businesses." Non-fossil fuel energy is included under the "qualified research" section. Links to further information are at http://www.hawaii.gov/tax/a2_b2_6hi_tech.htm.

Experiences with Wave Energy RD&D

The U.S. Navy has initiated an at-sea demonstration of the 20-kW PowerBuoy™, designed by Ocean Power Technologies, Inc. (www.oceanpowertechnologies.com). First deployed off the Marine Corps Base Hawaii at Kaneohe in 2004, the device was removed, upgraded and then redeployed in 2005.

In addition, the State of Hawaii and a major utility, the Hawaiian Electric Company, Inc., participated in a 2004 survey and characterization of potential offshore wave energy sites in Hawaii, conducted by E2I/EPRI as part of a multi-state assessment. Potential sites for a 1,500 MWh annual energy output demonstration plant were identified. The study concluded that the eastern coastline of Oahu just west of Makapuu Point offers a unique opportunity for wave power due to existing physical infrastructure and scientific resources. Reports for Hawaii, other participating states, and the program summary are posted at <http://www.epri.com/oceanenergy/waveenergy.html#reports>.

Wave power was acknowledged to be an emerging technology well suited for Hawaii in a 2002 report, but the report also noted that additional at-sea tests and cost reductions will be necessary to achieve commercial competitiveness. See the full report at <http://www.hawaii.gov/dbedt/info/energy/publications/wavereport02.pdf>.

Major international wave power companies have initiated discussions which may lead to commercial wave plants in Hawaiian waters.

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