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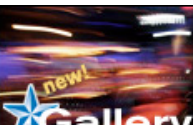


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With Hawaiian Electric saying it expects another power outage, are you taking steps to conserve energy?

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# Facilities on Big Isle to tap sea for energy

## Two proposed plants will use ocean heat to generate electricity

By Rod Thompson  
[rthompson@starbulletin.com](mailto:rthompson@starbulletin.com)

**HILO** » Because of the high cost of oil, creation of energy from ocean heat is making a comeback on the Big Island after being dormant since the 1990s.

Ocean Engineering & Energy Systems, a private engineering company with offices in Honolulu, will build the world's two largest power plants making electricity from sea-water heat, the company announced yesterday.

Both power plants will use ocean thermal energy conversion, an energy source on which experimentation began in the 1970s but which was dropped in the 1990s because it was too costly compared with cheap oil.

"It was not pursued simply for economic reasons," said Hans Krock, company president.

Since the 1970s the price of oil has gone from \$12 to \$70 a barrel.

During a signing of energy bills by Gov. Linda Lingle in Hilo yesterday, a 1-megawatt power plant at the Natural Energy Laboratory of Hawaii Authority in Kona was announced by energy lab Administrator Ron Baird.

Company Vice President Stephen Oney also announced a 13-megawatt plant to be built at an undisclosed ocean location for

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U.S. military forces.

"Most of the energy in the world is solar energy stored in the ocean," Krock said. "In 50 years the majority of the energy in the world will be from this source. It's the only one big enough to replace oil."

The Natural Energy Laboratory, next to Keahole Airport in Kona, was established in 1974 in response to the energy crisis that year.

Although it has branched out to several other activities such as growing algae for nutrients, the original purpose was to develop ocean thermal energy.

The process requires two sources of water with a fairly large difference in temperature. At the Natural Energy Lab, warm water is piped from the surface of the ocean where it can be used to vaporize a liquid such as ammonia, which then drives a turbine to produce electricity.

At that point the ammonia has to be cooled and condensed to continue the cycle.

Cooling is done with cold water pumped from about 2,000 feet below the ocean surface.

In the 1970s the largest ocean thermal energy conversion plant at Keahole produced only 217 kilowatts.

The new Ocean Engineering power plant will produce up to 1.2 megawatts, of which about one-third will be used to run pumps and keep the system going. That leaves net production of 800 kilowatts.

In comparison, Puna Geothermal Venture produces 30 megawatts of the 190 megawatts consumed by the Big Island.

The cost of the Kona facility will be \$10 million to \$15 million in private funding, Baird said. It will be operational in 2008.

The 13-megawatt military plant will produce a net of 8.2 megawatts plus 1.25 million gallons of fresh water a day.

In the long run, electricity from large ocean thermal energy conversion plants could be used to create hydrogen, Krock said, which could be used to power vehicles.

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