



NELHA to partner in energy plant

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The Natural Energy Laboratory of Hawaii Authority is finalizing a pact with a Honolulu company to bring the Kona facility back to the future.

Ocean Engineering and Energy Systems (OCEES) of Honolulu has proposed to partner with NELHA to build a 1- to 1.2-megawatt ocean thermal energy conversion (OTEC) demonstration plant at Keahole Point. If all goes well, officials expect the plant to be operating in about two years.

An OTEC plant at NELHA would be appropriate since it would fulfill the mandate from the 1974 state Legislature that created what was then a 322-acre support facility for OTEC research.

NELHA has since morphed into an 870-acre facility that offers tenants cold deep sea water for research and commercial applications.

In 1979, a barge named "Mini OTEC" was positioned off Keahole Point and demonstrated the first production of electricity through the process, which uses the differences of temperatures in the deep sea and surface waters. The last production of OTEC energy at NELHA took place in 1993 when the system, which has since been dismantled, produced 50,000 watts of electricity.

"The open-cycle plant proved the efficacy of OTEC," said Ron Baird, CEO of NELHA. "It produced net energy, but like all the other alternative energy plans, everything stopped in the mid 1990s because of the low cost of a barrel of oil -- around \$15 a barrel."

Now with oil at more than \$70 a barrel, Baird said alternative energy technologies are again becoming attractive because of their cost-effectiveness.

"There is a cross-over with capital costs and the price of fuel," Baird said. "Natural gas-fired plants are cheap and quick to build, but the cost of fuel has risen dramatically, and instead of paying \$2.50 per 1,000 cubic feet of gas, they're now paying \$6.46."

Baird said nuclear- or coal-fired plants are expensive to build, but the cost of fuel is relatively cheap.

"So it might take a while to pay off the debt, but fuel costs are very low," he said.

The partnership would involve OCEES spending \$10 million to \$15 million to build the plant and operating it with NELHA's 55-inch deep sea pipeline, which brings up 40.5-degree Fahrenheit water from a depth of 3,000 feet. NELHA would purchase the energy at a reduced cost and dedicate it to further development of alternative energy. Any other use would require the energy to be sold back to Hawaii Electric Light Co. and repurchased at retail cost.

"We've been pursuing this for about eight years," said Steve Oney, executive vice president of OCEES. "We had a proposal in 2000 or 2001, and now we're in the process of commercializing this process."

While there are no commercial OTEC plants in operation yet, Oney said the high cost of fuel and the low interest rates have made commercial applications viable. That being said, the plant at NELHA is not being built as a commercial venture but for demonstration purposes.

"People keep asking us why Hawaii doesn't have one," said Oney. "Our feeling is that a company based in Hawaii with much of the influence in OTEC technology should have a plant here. It will also elevate Hawaii to its rightful place as the showcase for OTEC; it will be the plant we bring the world to see."

One OCEES customer that doesn't need any convincing is the Department of Defense. Oney confirmed the military is



June 19, 1996 ocean thermal energy conversion plant at NELHA. - Baron Sekiya | West Hawaii Today

interested in OCEES's services, but said he was not at liberty to discuss the project.

Oney said OCEES has also spoken to automobile manufacturers, including General Motors, which has committed significant resources to hydrogen fuel cell research and development facilities.

But Baird said one of the challenges of hydrogen power is the amount of energy needed to produce it.

"We feel that it's going to take nuclear or ocean energy," said Baird. "That's where OTEC comes in."

Baird said hydrogen produced by OTEC energy could be used at the Hawaii Natural Energy Institute, which is setting up shop at the Gateway Center, where it will conduct experiments into hydrogen fuel.

"The electricity could also be used for another desalination plant to make potable water," said Baird. "Regardless, we'll find a use for the electricity."

Oney said hydrogen produced by OTEC would most likely take place on floating barges in tropical zones and then shipped to more temperate regions.

"We envision widespread use of this technology within the next 30 to 50 years," he said. "We see OTEC replacing fossil fuels during this time."On the Net

- <http://www.ocees.com>

- <http://www.nelha.org>

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