

## Key Milestones

- In 1973, Makai Ocean Engineering, Inc. was founded in Waimanalo, Hawaii.
- As a result of the 1973 Arab Oil Embargo, OTEC was identified as a potentially large, stable, renewable, domestic resource (energy security) and the State of Hawaii invested in a research center called the Natural Energy Laboratory of Hawaii (NELHA) in Kailua-Kona. Although OTEC was invented elsewhere, NELHA is considered by many as the birthplace of OTEC as many of the major OTEC experiments are conducted here.
- In 1978-1979, the State of Hawaii, Lockheed Missiles and Space Company, Makai and others completed a “mini-OTEC” project that consisted of a small barge floating about 1-1/2 miles offshore from NELHA, with a 2150’ long, 2’ diameter vertical intake pipe. Makai’s role was to design the intake pipe and mooring. This was the first net-power producing OTEC plant in the world, and the only one for offshore OTEC. This effort kicked off Makai’s nearly 40-year involvement in OTEC.
- From 1980-2001, Makai designed all of the current deep seawater pipes in operation at NELHA.
- In 1981, Makai performed environmental monitoring for OTEC-1, a large OTEC experiment offshore from NELHA.
- From 1983-1986, Makai performed design, analysis and construction management of an 8-foot diameter cold water pipe experiment in both down-the-slope and vertical configurations.
- In 1986, Makai designed and oversaw installation of the 40” diameter, 2,200’ deep seawater intake pipe that currently serves our 100 kW OTEC facility.
- In 2001, Makai designed the 55” diameter, 3,000’ deep seawater intake pipe that serves other water-bottling tenants.
- From 1995-1999, Makai performed design, construction management, and testing of a 50 kW OTEC heat exchanger test facility.
- In 2008, Makai and Lockheed Martin rekindled their earlier OTEC support from the 1970’s, and began working on a design for an offshore OTEC plant for the Navy.
- In 2009, Makai was funded by Naval Facilities Engineering Command (NAVFAC) to design and build the infrastructure for an OTEC heat exchanger test facility and marine corrosion laboratory in Hawaii.
- In 2011, Makai opened the OTEC heat exchanger test facility and began testing heat exchangers and corrosion research.
- In 2013, Makai was awarded a contract to add a turbine-generator to the facility.
- In 2014, Makai received the turbine-generator at the OTEC facility, re-branded as the “Ocean Energy Research Center.”
- In 2015, Makai produced power and connected to the grid, making this facility the world’s largest operational OTEC plant, and the only one connected to a U.S. grid.