WHAT IS OTEC?

The world's oceans are the largest solar collectors on earth. Each day, the sun heats the ocean's surface waters, while the deep ocean remains near freezing. Ocean Thermal Energy Conversion (OTEC) uses the temperature difference between the deep cold ocean water and warm tropical surface waters to run a power cycle and generate electricity. This power cycle is similar to those used in traditional thermal power plants, but at lower overall temperatures. However, the only fuel for an OTEC plant is the heat energy contained in seawater. This is a natural solar resource that is freely available 24/7, sustainable, and virtually inexhaustible.

HOW OTEC WORKS

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OCEAN THERMAL RESOURCES

Temperature Differences Between Surface and 1000m Depth

KEY MILESTONES FOR THE MAKAI OCEAN ENERGY RESEARCH CENTER

Makai was awarded a U.S. Navy contract to study the feasibility of offshore OTEC plants.

Makai was awarded a contract to add a turbine-generator to the facility.

Makai produced power and connected to the grid, making this the world's largest operational OTEC plant, and the only one connected to a U.S. grid.

Makai and Lockheed Martin resumed their OTEC partnership that had begun with "mini-OTEC" in 1978.

Makai opened the OTEC heat exchanger testing and marine corrosion labs.

Makai received the turbine-generator at the OTEC facility, re-branded as the "Ocean Energy Research Center".

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OFFSHORE COMMERCIAL-SCALE OTEC PLANT COULD...

...prevent burning roughly 1.3 million barrels of oil each year

...produce electricity at roughly $0.20/kW-hr levelized cost of energy

...prevent CO2 emissions of over half a million tons per year (over 100k cars)

100 MW OF POWER

~120,000 Hawaiian Homes

Powered by Seawater

ONSHORE OTEC (OPERATIONAL)

100 KW OF POWER

~120 Hawaiian Homes

Powered by Seawater

OFFSHORE OTEC (FUTURE)