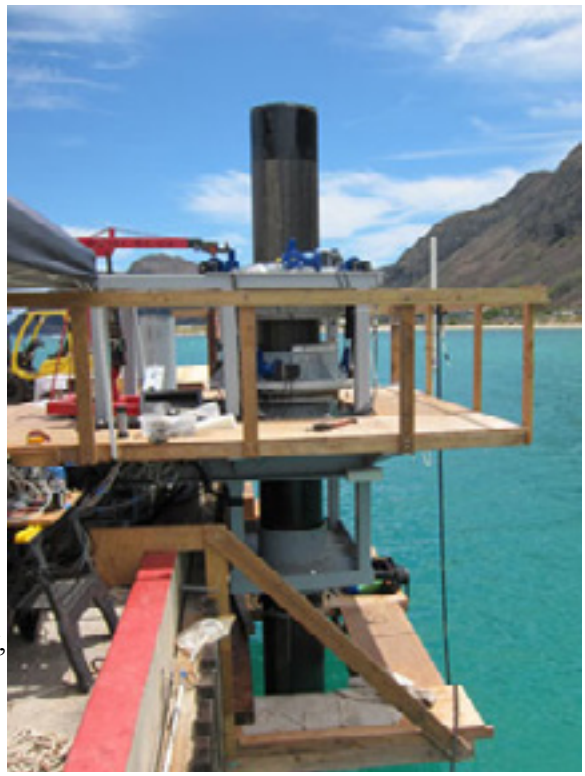
Industry Focus

Other Forms of Renewable Energy

Hawai‘i, due to its unique location, is blessed with an abundance of natural resources that would be very beneficial in achieving the state's clean energy initiative. Wind and Solar are the most well-known options however there is great potential in a number of other resources. Two such options and their potential are presented here.

Ocean Energy

Oceans cover over 70 percent of our planet; the sun heats its surface, wind creates waves, and tidal forces exerted by the sun and the moon create tidal fluxes.[1] Ocean energy is best utilized via two methods: *Marine Hydrokinetic Energy* (MHK), which converts kinetic movement into energy using devices that either spin or bob up and down in ocean water, and *Thermal Energy*, otherwise known as *Ocean Thermal Energy Conversion* (OTEC). OTEC relies on deep ocean water that is significantly colder than the tropical surface, and uses that temperature difference to create energy and seawater air conditioning. OTEC systems are operable 24/7, 365 days a year, which creates an attractive alternative to fossil fuels. Pathogen free and nutrient rich freshwater is also a potential by-product, which would be useful for fish farming.



Makai Ocean Engineering's OTEC plant on Hawai'i Island is currently the world's largest OTEC plant.
Image source: Makai Ocean Engineering

The Natural Energy Laboratory of Hawai‘i Authority (NELHA) at Keāhole Point on the Big Island administrates the Hawai‘i Ocean Science & Technology Park (HOST), which acts as a business incubator, research facility, and economic development agency[2]. NELHA and HOST have been working and experimenting with OTEC facilities since 1974, however there are no commercial plants anywhere in the world. These plants were found to be technically feasible, but were also prohibitively expensive in comparison to oil prices in the 1970s. Negotiations are being made for a power purchase agreement with an ocean thermal energy conservation company.[3]

1 Hawai‘i State Energy Office. Ocean Energy.
http://energy.hawaii.gov/renewable-energy/ocean
2 Friends of HELHA.
http://friendsofnelha.org/
3 Hawaiian Electric Ocean Energy. http://www.hawaiianelectric.com/heco/Clean-Energy/Renewable-Energy-Basics/Ocean-Energy

Geothermal Energy

Geothermal energy comes from volcanic heat stored beneath the earth's surface. Underground reservoirs of water heated by volcanic activity can be tapped for steam to generate electricity.[4] Puna Geothermal Venture (PGV) is a plant located on the Big Island which supports the green initiative by re-injecting 100 percent of geothermal fluids back into the ground to be reheated, as well as having a small-footprint design, near-zero emissions, and reduces noise pollution.

The Puna Geothermal Venture on Hawai'i Island
Source: Ormat

The Geothermal Energy Working Group was created in June 2010 in order to develop a feasibility and cost-benefit analysis for the development of geothermal energy, including analysis of community, environmental and economic benefits. The Big Island's Hawai'i Electric Light Company negotiated and signed a purchase agreement with PGV in order to receive 30MW of power from the plant. Plans to expand geothermal power to West Hawai'i and Maui are being explored.

4 Hawaiian Electric. Geothermal. http://www.hawaiianelectric.com/heco/Clean-Energy/Renewable-Energy-Basics/Geothermal