

## HECO inks biofuels deal with algae-based producer

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### ALGAE TO ELECTRICITY

Phycal Inc. plans to grow algae on a 34-acre parcel north of Wahiawa that will be used to produce biofuel to be burned at Hawaiian Electric Co.'s Kahe Generating Plant.



Source: Phycal Inc.

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Hawaiian Electric Co. announced Thursday it has signed a deal to buy up to 150,000 gallons of locally made algae-based biofuel to burn in its Kahe Generating Station as part of the utility's shift away from its reliance on fossil fuels.

HECO has successfully tested other types of biofuel in its electrical generators but this will be

the first time the utility will be using fuel derived from algae, which is capable of yielding more oil per acre than any other biofuel feedstock.

The contract is the third signed by HECO this year for locally produced biofuel and is under review by the state Public Utilities Commission. One of the earlier biofuel contracts, the Aina Koa Pono project on Hawaii island, was rejected by the PUC on Thursday. Aina Koa Pono was to have used wild plants and cultivated crops to produce liquid fuel, but the PUC ruled the cost was too high.

Phycal Inc. has agreed to deliver the first shipment of "algal oil" by 2014 as part of a pilot project using algae it plans to grow at a 34-acre facility near Wahiawa. HECO already has demonstrated that it can substitute crude palm oil for the low-sulfur fuel oil it normally burns in the steam generating units at the Kahe plant, and utility officials said they expect the pilot project will confirm the ability to use algae-based fuel as well.

Cleveland-based Phycal said it plans to follow the pilot project with a full-scale demonstration project that would produce up to 3 million gallons of algae-based biofuel per year. If that proves successful Phycal would significantly expand its operation and ramp up to commercial-scale production of 50 million gallons a year, said Kevin Berner, president and chief executive officer of Phycal.

Phycal has completed an environmental assessment for the project, held meetings with two neighborhood boards and is finalizing permits it needs for site preparation and construction of buildings. The company hopes to break ground late this year or early next year, Berner said.

Although it is generally accepted in the energy community that algae holds much promise as a biofuel feedstock, no company has yet been able to make the leap from research and development to commercial production. Phycal has received more than \$50 million in federal funding in two phases to get its Hawaii project to where it is today.

Berner said he is confident that Phycal's patented process for growing algae and extracting the oil from it will make its product economically viable when done on a commercial scale.

"We get asked if we can sell our product without an operating subsidy and the answer is 'yes.' If we scale it up, we can sell it as a cost competitive with petroleum-based fuel," Berner said.

Under Phycal's production process, which it has refined at its headquarters in Cleveland, the algae are initially grown in outdoor ponds. The "skinny" algae are then moved indoors and fed sugar and other nutrients to fatten them up and increase their concentration of lipids, their oil, Berner said.

Berner would not disclose Phycal's expected yield of algal oil per acre, but HECO cited studies that show that algae can produce more than 10 times the amount of oil as land crops. A report from the National Renewable Energy Laboratory said that algae can yield anywhere from 1,200 gallons to 10,000 gallons of oil per acre. The next highest yielding plant is the oil palm, which can produce 635 gallons of oil per acre, according to NREL. Corn, by comparison can yield 18 gallons of oil per acre.

Phycal is leasing former pineapple plantation land for its venture and will be growing the algae in nonpotable water from a local sewage treatment plant. The company also will use recycled carbon dioxide from the Tesoro refinery in the algae-growing process.

HECO's push to use biofuels to replace some of its petroleum-based generating capacity has drawn criticism from environmental groups and others who say locally produced biofuel should be used for transportation rather than electricity needs.

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