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Reyes' hybrid design powers Hawaiian project

BY RAY HUGHEY

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While water may not mix well with oil, a Portland electrical engineering firm is working to show it goes great with sunlight, as far as renewable energy is concerned.

Reyes Engineering Inc. of Portland is designing a hybrid alternative energy system that combines solar-generated electricity and a hydrogen fuel cell for a botanical garden in Hawaii. The system eventually will power a gift shop at a garden visitor's center on the island of Kauai.

"The most unique thing about the hybrid energy system is that it uses water for fuel," said Flaviano Reyes, president and CEO of the 5-year-old electrical engineering consulting firm. "Using water as fuel is probably the most green, sustainable solution there is for generating electricity. It produces no pollution, just pure H₂O, hot steam."

While part of the power comes from the fuel cell, the rest comes from 1,500 square feet of solar photovoltaic panels that convert sunlight into electricity.

The sunlight-generated electricity not only helps power the gift shop, it also will run an electrolysis system that separates water into hydrogen and oxygen. The hydrogen, which will feed the fuel cell, is stored in large tanks that can hold a three-day supply. The sunlight will provide power most of the day, with the fuel cell kicking in when the day is dim.

The hybrid renewable energy system will run selected equipment in the gift shop, such as lights, fans, computers and cash registers, providing nearly 90 percent of the shop's electrical needs, Reyes said.

If the photovoltaic panels produce more power than the shop needs, the excess power will be returned to the local utility grid.

The project started about nine months ago, when Reyes Engineering was contacted by the National Tropical Botanical Gardens in Hawaii. The nonprofit organization had received a donation of a hydrogen fuel cell and wasn't sure what to do with it.

Reyes' company, which had already been studying alternative energy sources, jumped at the chance.

"We had been researching this and

knew we could help maximize the potential of the fuel cell," Reyes said. "It was a great opportunity for us."

His company is working in partnership with the University of Hawaii on the project, which also will serve as an educational tool demonstrating clean renewable energy sources.

The design process is about three-quarters completed and should be finished in late January. Construction will begin in mid-2004.

Reyes' company has been doing some heavy-duty research with fuel cell manufacturers and vendors.

"A lot of this technology is cutting edge," Reyes said.

Not many firms out there have designed a project like the one in Hawaii. However, with more people and businesses beginning to ask about the status and feasibility of renewable energy, Reyes is thinking about capitalizing on the experience his company has gained by adding a renewable energy sources service to his firm.

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