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Two DWS projects aim to save

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Kahaluu Well "A" is seen in this photo taken Thursday. - Michael Darden | West Hawaii Today

Two hydroelectric projects anticipated to begin by the end of this year should help the county's Department of Water Supply tackle its second priority of saving energy through efficient systems. The department's first priority is providing safe drinking water.

The 50-kilowatt hydroelectric units, located at the Kahaluu Shaft and Kaloko Tank No. 2 could each generate -- if running at 70 percent capacity -- enough electricity to power roughly 38 households per day (based on an annual household usage of 7,800 kilowatt-hours), according to Michael Maloney of SOAR Technologies, Inc, the company supplying the hydroelectric units.

DWS is currently the largest energy consumer on the island with a projected total energy cost of $15 to $16 million this year, said Bettina Arrigoni, DWS energy management analyst. To date, the department has already spent $13 million this fiscal year.

Exactly how much savings the hydroelectric units will bring is yet to be determined, she said. When the system is up and running, the department will have a better idea of energy output. The Kaloko project is slated for completion in November, and the Kahaluu project in December, she added.

Maloney said the units being installed are hydroelectric turbine designed specifically for this type of application. The energy produced is based on the amount of water passed through the hydroelectric turbine and the amount of water pressure loss (or drop) across the hydroelectric turbine.

"The higher the water flow and/or the higher the pressure drop, the more energy produced," said Maloney. "Water flows into the water turbine, spinning the shaft of a electric generator, generating power into the power system."

The hydroelectric equipment is called a GPRV which is (Power) Generating Pressure Reducing valve. This equipment is installed in parallel to the existing (PRV) Pressure Reducing Valve equipment used to fill the water tank, said Maloney. The equipment recovers the energy normally lost when reducing the water pressure used to fill the water tank.

While the energy generated at Kahaluu Shaft would provide 10 percent of the pumping system's power, all energy at Kaloko is likely to be sold back to Hawaiian Electric Light Co. The rate paid for this energy could not be obtained by press time.

The Kaloko project cost $410,000, with about 75 percent of the cost paid by a $300,000 grant from the U.S. Department of Agriculture's Rural Development's Electric Programs, High Energy Cost Grant Program, Maloney said. The Kahaluu project cost about $561,000 with the department paying the entire cost.

Each project is predicted to have a five- to six-year investment return, and each unit has a 30-year life expectancy, he said.

There are not plans for more hydroelectric units at this point, said DWS Deputy Manager Quirino Antonio. Sufficient pressure and electricity use are some factors considered in selecting sites for these units, he said.

The DWS services about 35,000 customers with about 8.5 billion gallons of water annually. In 2001, the Board of Water Supply increased rates 28 percent in 2001 and 15 percent for 2003. It also adopted an inverted block rate structure to encourage conservation, according to the department's site.

The structure charges higher unit costs for heavy water users. Customers using about 10,000 gallons per month will pay an additional $4.80 per month, while customers using 5,000 gallons will pay $2.65 more per month, a DWS informational sheet noted. The percentage increase will vary with larger percentage increases for heavier users.

What is the highest elevation well on the island?

Currently, the highest elevation well that DWS operates and maintains is Kalaoa Well at approximately 1800' elevation. This is in the North Kona area. We are currently in the design stage of outfitting a well in Waimea near our water treatment plant. That will be approximately at the 3050' elevation.

What is the cost of pumping water from well to surface relative to depth?

This one is a bit complicated as there are many factors that contribute to the cost including pump capacity, depth of the well, pump and motor efficiencies, size of pipe column, etc.

SOURCE: DEPARTMENT OF WATER SUPPLY
