

Oregon Department of Energy

Saving Energy Saves Everything



Deschutes County hydroelectric plant generates income—offsets costs

Hydroelectric power dominates Oregon’s electricity portfolio, providing up to 41 percent of its electricity needs. Oregon expects to see new growth in hydroelectricity from small-scale irrigation systems. Irrigation districts lead the way on building and operating low-impact plants that have a limited environmental footprint and create revenue, offsetting system maintenance expenses.

[Central Oregon Irrigation District](#), founded in 1918 and located outside of Bend, Oregon, is comprised of two successful low-impact hydroelectric plants: Siphon Power and Juniper Ridge. Both plants – together – generate \$700,000 in annual revenue.

COID provides industrial and agricultural water to nearly 45,000 acres and 7,000 customers in Deschutes, Crook and Jefferson counties. Pacific Power serves all three counties and purchases some of COID’s electricity for its renewable energy portfolio.

Siphon Power plant, produces – at capacity – a little over five megawatts of electricity. COID built this plant in 1987, and began operating in 1989.

Juniper Ridge is COID’s newest facility built in 2009. The

district opened Juniper in late 2010, which currently produces over three megawatts of electricity with a capacity of 5 megawatts. COID earns \$100,000 in yearly revenue from Juniper and projects the plants revenues to increase to \$1 million annually, in about 16 years.

“The ability to bring an additional revenue stream separate from assessing customers provides the district greater financial stability,” says Steve Johnson, district manager.

Johnson explains that establishing hydropower facilities—off channel—in canals and behind fish screens, limit impact on the environment. Therefore, irrigation districts should strongly consider evaluating their irrigation canals for hydropower generation opportunities, particularly if the district has certified fish screens on its diversions. Districts that pipe canals to enhance power generation conserve water through reduced evaporation, returning more water in-stream to benefit habitat and enhance water quality.

Further, the district serves the needs of its customers without diverting much river water. For example, the Juniper Ridge hydropower pipeline plant conserves

nearly 19.6 cubic feet per second of water, placing the conserved water in-stream for the Deschutes River restoration.

Juniper Ridge Financial Analysis

Districts usually pay minimal costs for maintaining a low-impact hydropower and can operate a plant for many decades without major problems.



The Juniper Ridge facility opened in September 2010

“These plants have a long lifespan and can operate up to 50 years without a major overhaul,” Johnson says.

COID spent around \$24 million to build Juniper Ridge. COID invested over \$2 million and the Oregon Department of Energy’s Small-scale Energy Loan Program provided \$17 million for the financing.

“Without SELP, COID couldn’t have built the facility,” says Johnson.

COID also used other financial programs such as Business Energy Tax Credit pass-through option and grants from the Energy Trust of Oregon, Department of Environmental Quality and Portland General Electric’s Pelton Dam Fund.

Johnson spoke about research as a crucial first step before seeking project financing. A district must solidly a site and determine a realistic project with realistic goals.

“Without a concrete project proposal that includes construction assumptions, costs and time constraints, no one will touch you (lenders and/or contractors),” says Johnson.

COID leadership structured the project under an EPC—

Engineering, Procurement & Construction—model where a single contractor takes responsibility for all three areas. This means that the EPC contractor carries the project risk for the schedule, as well as the budget, in return for a fixed price. The EPC can limit project cost overruns and change orders. The EPC completes the project and then hands district owners the keys to a fully functional facility.

COID before being built, the Juniper Ridge project underwent a review by the [Federal Energy Regulatory Commission](#) through a conduit exemption process, which, according to Johnson, was not as onerous or expensive as a full FERC licensing process. Once the project application was submitted, the FERC project order required up to six months for approval.

Largely the project received broad support from community members. Economic benefits extend beyond the district, including construction jobs for building the project.

“A locally-owned hydroelectricity facility keeps electric rate dollars local, provides irrigation districts long term financial stability which helps agriculture stay viable,” Johnson says.

Currently the district is exploring the possibility of building six additional plants near Bend and Redmond with the help of a \$36,000 grant funded from the Oregon Department of Energy’s Community Renewable Energy Feasibility Fund.

About the State Energy Loan Program

The purpose of the Small-scale Energy Loan Program (SELP) is to promote energy conservation and renewable energy resource development. For information, visit ODOE at Oregon.gov/ENERGY/LOANS/index.shtml

Interview with Steve Johnson, district manager, Central Oregon Irrigation District and article by Sylvia McDaniel, ODOE Public Affairs and Outreach.