

SOUTHERN IDAHO'S INNOVATIVE RENEWABLE ENERGY PROJECTS: GENERATING POWER AND REVENUE

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Renewable energy projects are often designed from the same blueprint; wind turbines and solar panels for electricity and dams to harness hydroelectric power. But two not so common renewable energy sectors – geothermal and biomass – are successfully operating in southern Idaho with projects that are setting the stage for how innovative renewable energy projects can generate energy as well as revenue.

Southern Idaho's unique location and geography offers an abundance of naturally-rich resources that fuel numerous renewable energy operations. Aside from large companies looking at this region for potential projects, other small commercial operations are operating here to take advantage of nature's not-so-common resources.

Idaho's Warm-Water Fish

Operating a warm-water aquaculture business sounds great for a sunny coastal location...certainly not in Idaho. But, the small southern Idaho community of Hagerman provides what no other location can: a year-round supply of 90 – 95° F surface water. While geothermal water is a no-emissions renewable energy supply available 24/7, all year long, only a few regions in the country have this viable commodity.

Utilizing geothermal energy for raising fish rather than generating electricity is an innovative use of this special resource. Strangely enough, southern Idaho is an ideal location for growing several fish species that require hot water to thrive.

Fish Breeders is one of the most unique operations in Idaho. Owner/operator Leo Ray tapped into the region's natural geothermal waters back in 1973 before renewable energy was even an industry. Recognizing the abundance of geothermal



Spawning tropical fish thrive in southern Idaho's warm geothermal waters at Fish Breeders in Hagerman.

waters, Ray has taken advantage of this renewable energy sector to fuel his successful aquaculture operation.

Located along the Snake River in southern Idaho, Fish Breeders utilizes eight wells to draw up hot 90° F water to the surface to raise catfish, tilapia and numerous species of tropical fish. While Fish Breeders' wells are about 500 feet down, water temperatures reach 160° F some 4,000 below the surface.

"Geothermal hotspots are plentiful in this region, less than 100 miles from Yellowstone National Park," explained Ray. "Massive deposits of molten rock deep below southern Idaho's surface heats the water that seeps down into the ground from snow and rain," he said. "The area's aquifer is constantly replenished to provide our aquaculture operation with

an unending supply of warm artisan water for year-round operations," he said.

Fish Breeders' catfish and tilapia are processed and packaged on site for distribution to markets and restaurants around the country.

The tremendous potential to raise and sell a large variety of tropical fish was added by Ray to his operation in 2009. "Tropical fish do not require as much feed or oxygen as catfish and tilapia," Ray said. "And while catfish and tilapia run about \$2 per pound, tropical fish sells for \$40-\$50 per pound. I anticipate Fish Breeders will add more tropical fish species over the years as our customers request a larger variety," he said. Today, over 60 species of tropical fish are spawned, raised, sold and distributed by Fish Breeders.

Converting Dairy Waste to Electricity

Renewable energy innovation also shows up on Idaho's dairy farms. Idaho is home to nearly 570 dairy farms and 551,000 dairy cows. 400,000 of those cows are in southern Idaho. And, as the third largest dairy producer in the United States, the state's potential to generate electricity from dairy waste is substantial.

One of southern Idaho's largest dairy operations is proving how environmental innovation can both diminish green house gases and generate electricity.

Luis Bettencourt, owner/operator of 13 dairy facilities in southern Idaho, has partnered with Cargill to operate an anaerobic digester at two of his dairies. The digesters take cow waste and break the waste down to create methane biogas, which is then captured in a series of generators to produce electricity. All the electricity is sent directly to Idaho Power's grid.

Utilizing waste from some 15,000 cows, both digesters combined produce over 3,200 kW of electricity or enough to power 2,500 homes every month. In addition to electric generation, Bettencourt's Cargill digesters generate carbon credits from reducing methane emissions into the atmosphere.



Cargill Anaerobic Digester

"Converting waste into energy minimizes our environmental impact and provides a consistent source of renewable energy that can be distributed to our surrounding communities," said Bettencourt Chief Financial Officer, Rick Onaindia. "The true value of this project is its ability to serve as a model for the Idaho dairy industry for long-term sustainability, both from an environmental and business perspective." *

According to Cargill Biofactory Idaho operation's supervisor, Ryan Coleman, southern Idaho's large concentration of dairies, coupled with concerned environmental farmers like Luis Bettencourt, make for a win-win business proposition.

"Cargill is interested in renewable energy projects and decreasing dairy farm emissions by converting gases into energy and carbon credits," Coleman said. "We see biomass-to-electricity power as one of the best ways to not only protect the environment, but to help dairies manage

their waste. Southern Idaho is an ideal location for biomass energy operations," he said.

As the country looks to expand and improve on renewable energy sources, southern Idaho -- with its richness in alternative fuel resources and project innovation -- serves as national model of success in methods of use and conversion. 🏡

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You're Gonna Love Our Carbon Footprint.

You might call it the five toes of our great carbon footprint; wind, solar, hydropower, geothermal and biomass. Until recently, Southern Idaho boasted that it produces commercial renewable energy in four out of five of these categories, but with the recent announcement of a major solar farm, we will soon have all five.

We know it takes more than a big foot and natural resources to make an alternative energy project viable. Southern Idaho has the infrastructure in the form of high capacity transmission lines to move power from the various sources to the grid. Without transmission, the energy is trapped. With so much alternative energy production going on, renewable sector manufacturing in Southern Idaho will boom. Almost two thirds of the renewables market is projected to site their projects in the western US. And we're working hard to assure a highly trained workforce that can deal with the manufacturing and servicing side of the business.

The College of Southern Idaho recently designed new "green" energy education programs to meet the needs of this growing and quickly changing economic sector.

So what about the other 5 toes? Got 'em covered; National attention, state support, we offer the opportunity, we have an entrepreneurial spirit, and we are optimistic that renewable is the next big thing, so 'hang ten, and surf southernidaho.org.

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