



## 'GreenWhey' turns cheese wastewater into energy and more



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A \$28 million renewable energy project underway in Turtle Lake will convert cheesemaking byproducts into electricity, heat and a new fertilizer. The aim is to provide an alternative to land-spreading of cheese plant wastewater (high in organic content and phosphorus), while at the same time generate electrical power for nearby

homes and businesses, while at the same time, cheaper heat for dairy plants.

Instead of being a liability for the cheese industry, dairy wastewater will be transformed into valuable commodities, thanks to pioneers at GreenWhey Energy in Turtle Lake.

GreenWhey Energy was formed by Tom Ludy (GreenWhey Energy's president), Turtle Lake, and Larry Peaster and son, Tim, dairy waste haulers (Northern Liquid Waste Management) at Almena. Ludy's son, Eric, recently returned to the U.S. from Peru, where he had been working, to get involved in the project.

The elder Ludy literally grew up in among the cheese vats of Twin Town cheese at Almena, which his dad, John, operated until 1998. (It's owned by Saputo.) In 2001, Ludy founded Lake Country Dairy at Turtle Lake, which is now owned by an East Coast-based firm. Today, the Ludys are concentrating their efforts on construction of a first-of-its-kind anaerobic digester. Construction started in Oct. 2011; they anticipate it will be up and running mid-June.

This cutting-edge facility in Turtle Lake will squeeze every bit of energy out of food-process wastewater (i.e. milky rinse water left from cheese production). From 500,000 gallons of wastewater a day, GreenWhey Energy will produce enough methane biogas to produce electricity for some 3,000 homes (i.e. 3.2 megawatts). Power will be sold to Xcel Energy in Eau Claire.

But that's not all. An estimated 140 million BTUs of heat will be generated to supply the hot-water needs of area dairy plants. Leftover sludge material from the digestion process will be pressed to produce a high-value fertilizer product. And, say the Ludys, water almost clean enough to drink is leftover – as opposed to the high-strength wastewater that is now closely regulated for land-spreading by the Wisconsin Department of Natural Resources.

The Ludys explain that every day, dairy plants across the country go through thousands of gallons of rinse water in their cleaning cycles. With its diluted whey and milk, the water

is full of fats and proteins that carry a lot of innate energy. Dealing with this wastewater has been a source of much anxiety for cheesemakers. GreenWhey Energy offers a state-of-the-art, highly environmentally friendly solution.

After anaerobic digestion, what’s left is methane gas (biogas), carbon dioxide, clean water and a nutrient-rich solid that will be used as a fertilizer. The methane, as noted, will be burned to generate electricity. Heat from the process will be captured and sent by pipeline to area dairy manufacturers.

Wastewater from dairy plants will be delivered by tanker trucks and pipeline to GreenWhey Energy’s on-site storage tanks. Pre-treated water will enter the system through two separate anaerobic digesters, where organic material will be broken down in a biological process. Biogas is produced and captured and used to power on-site generators. Excess bacteria will be used to treat future streams of wastewater, thus creating a self-sustaining cycle of biogas production.

Electricity and hot water (which can, in turn, be utilized by cheese and food plants) are the valuable commodities produced. Further, after digestion, nutrient-rich solids will be separated from the water, dried and used as fertilizer. The remaining water will be cleaned in aerobic tanks and sent pre-treated to Turtle Lake’s municipal water treatment facility. The Ludys note, however, they are working on accessing DNR permits for eventual above-ground discharge of clean water.

“The whole process stands on its own two feet,” says Eric, who’ll be one of six plant operators. In total, the all-computerized, high-tech facility will employ over a dozen full-time workers.

GreenWhey Energy has teamed up with Ecolab (a firm out of the Twin Cities responsible for the patented Belgian-designed up-flow digester) and Caterpillar, which is contributing financing to the project.

The Ludys say that five food processors in northwest Wisconsin are already on board to deliver wastewater to GreenWhey Energy’s digester. They are Lake Country Dairy (just across the road from the digester), Saputo’s Almena cheese plant, Comstock Creamery in Comstock (owned by Ellsworth Cooperative), AFP (Advanced Food Products) in Clear Lake, and World Food Processing, a soy plant at Turtle Lake. It’s anticipated other food plants within a 60-to-90-mile radius of GreenWhey Energy will also come on board.

GreenWhey Energy is believed to be the first privately owned anaerobic digester in the country to take in dairy and food industry wastewater from multiple facilities.

For Tom Ludy, this massive project is a labor of love. He wants to see smaller, independent cheese operations remain “viable and competitive.”

His son, Eric, says anaerobic digestion is a “smarter way of handling waste.” Instead of scrambling to get rid of it, they’re turning it into products that have value. GreenWhey is a “new model” and “new approach” for the dairy (and food) processing industry. Plants will save money in the long-term, too, as paying to have their wastewater sent through the digestion process at GreenWhey is less expensive than land applying it.

The Ludys and the Peasters formed GreenWhey Energy primarily with this end in mind – to help strengthen Wisconsin's dairy industry and turn environmental challenges into "green" opportunity.