MichiganFarmer

Fremont digester turns food waste into energy, fertilizer

Jennifer Kiel | Apr 21, 2020

The Michigan plant runs around the clock every day of the year.

Under new ownership and with an infusion of $3.5 million in improvements, the Fremont Regional Digester in Fremont is again running, turning commercial food waste into energy and producing digestate, a fertilizer being used by area farmers.

The digester was built in 2013, but faulty engineering led to nonstop odor complaints from neighbors. It went into bankruptcy and was bought in 2017 by Generate Capital. It went online in 2018 and has been ramping up production ever since, now operating at about 80% capacity.

To control the smells, new 40-foot-by-40-foot biofilter equipment moves air emitted from the digester through a mix of wood chips, peat moss and other organic materials. Spot checks are done daily to measure odors around the facility.

With an annual operating budget of about $3 million, the digester employs 20 people, including 12 full-time employees.

Manure originally was used to get the biological process started, says Janice Tran, director at Fremont Regional Digester, but now the bulk of the inputs are dairy, poultry, fruits, vegetables and beverages coming from food companies and manufacturers.

“You wouldn’t believe the amount of food waste there is,” says Leon Scott, facility manager. “A lot of it is perfectly good product, but it’s either outdated, rejected or no longer needed. It’s exciting to have this opportunity to recycle it rather than dumping it in landfills.”

The plant runs around the clock every day of the year and produces 2.85 megawatts, enough to fuel the facility and 2,500 households. An average of 10 truckloads of product are delivered daily from about 30 different sources per month, who all pay a fee to dispose of the waste. The packaged materials are run through a crushing machine to release everything from applesauce and beer to green beans and baby food.

The packaging is recycled, and the organic material is pumped over to four massive tanks where bacteria breaks down the food. Last year, the digester received almost 20 million gallons of organic waste.

The gas produced by the digester is 65% methane, with the remainder being mostly carbon dioxide. It is burned by two huge, 20-cylinder engines, housed in a room by themselves and requiring hefty ear protection to enter. The energy produced is sold to Consumers Energy and put on the grid.

Digestate produced

The digestate is temporarily stored onsite before being trucked a few miles away to two 10 million-gallon lagoons.

About a dozen growers from around the area pick up the digestate from the lagoons and apply it to about 1,000 acres of farmland in the spring and fall, Tran says.

The digestate is free to growers and is very nutrient dense, says Dan Meccariello, operations manager. “It varies seasonally, but on average, the nutrient content has been 10-1-6 for nitrogen, phosphorus and potassium in pounds per 1,000 gallons,” he says. “When operating at full capacity, the facility can generate 100,000 gallons of digestate a day.”

Odors from the lagoon also were a concern, Tran says, which prompted the company to establish a temporary straw cover in August.

“We had experts design permanent covers,” she says. “Three odor surveys are conducted around the lagoons daily.”

Meccariello says the covers were scheduled to be installed April 1. “But due to the current COVID-19 situation, we are not certain on the exact date the installation will begin,” he says. “The manufacturer and installation contractor are from out of state, and current travel restrictions are making this hard to predict.

“All of the materials for the covers have been delivered to the site and are ready to be installed. We will be providing an update on our website as soon as we have a confirmed schedule. The temporary covers will continue to be maintained until the permanent covers are installed.”

According to the American Biogas Council, Michigan ranks 15th out of 50 states for its biogas production potential. It estimates up to 32.37 billion cubic feet of renewable methane from biogas could be produced each year. And, if realized, this would eliminate more than 3 million tons of food waste going to landfills annually.

Michigan leaders have set a goal of doubling the amount of recycling in the state by 2030.

Growers interested in contracting to receive digestate should contact Leon Scott at 231-519-9239, email info@fremontdigester.com or visit the company’s website at fremontdigester.com.