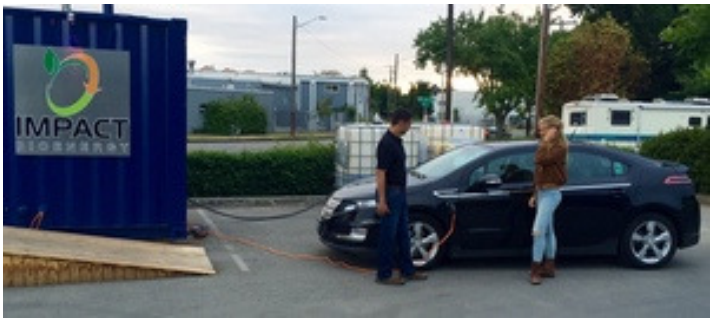
Impact Bioenergy's microdigester testing waste at Seattle brewery

By Katie Fletcher | May 31, 2016



This photo shoes the Chevrolet Volt plug-in electric vehicle receiving an electrical recharge from the digester—fueled by food waste.
Impact Bioenergy

Seattle-based Impact Bioenergy, a small startup focused on distributed energy with its portable, prefabricated anaerobic digestion (AD) technology, deployed its first microdigester at the Fremont Brewery Co. in Seattle this April.

The company manufactures and sells bioenergy systems that convert organic waste materials into renewable natural gas and fertilizer with zero waste. Impact Bioenergy has two systems: The HORSE 25 series with the capacity to divert 135 pounds of waste per day from waste generators and the NAUTILUS 185 series with the capacity to process 1,000 to 5,000 pounds per day.

At Fremont Brewery, it's the HORSE bioenergy system that is currently being deployed. The system's footprint takes up approximately 160 square feet of ground space and arrives completely built. The only setup required is to make a water and a power connection and the plant is up and running, according to Impact Bioenergy president Jan Allen. "We have made it simple and easy to operate this system—about as complicated as operating a fish aquarium," Allen said.

The process begins with the collection of food waste, edible liquids, or fats, oils and grease in an oversized sink for inspection and pre-grinding. This breaks things like chicken, fish, cabbage and pineapples down to bite-sized pieces. The system has a blending and feeding system that runs automatically so labor cost is minimal, Allen said. You simply look at the temperature, mixing, liquid level, pressure, gas storage and battery status when feeding the system.

The bioenergy system unloads itself using gravity flow and hydraulic displacement. The microdigester also has pressurized gas storage, which is pumped by the microbes themselves using a water-based regulator system. The HORSE unit at the brewery has 175 cubic feet of gas storage and expanded storage is available as an option.

The unit comes equipped with odor control designed not only to capture and prevent odors but to treat the ventilation exhaust air using biocarbon, biofiltration and neutralization. The resulting liquid soil amendment is further treated to improve biotics for plant growth.

The brewery installation is delivered with a 4-kilowatt electrical generator and accessory valving for heat, hot water, lighting and fire features. Safety features of the system include a 12-volt surplus gas burner safety system, weather protection and secondary containment. The AD process is a 30-day process and the digester has three chambers. Its design is patent-pending and runs as a continuous process. There are no moving parts inside the digester and its designed for a 20-year life cycle.

Last summer, the company tested commercial food waste with a microdigester in British Columbia. “The results were so good last summer, we designed for nine times the digester volume in gas every day, so a 100-cubic-foot digester is designed to make up to 900 cubic feet of gas a day,” Allen said.

The microdigester at the brewery was deployed in April of this year. “Now, for the next three months, we’re going to be testing exclusively on brewery waste,” Allen said. Brewery waste includes yeast, spent grain, wort and trub.

The installation at the Fermont Brewery Co. was made possible through a grant from the city of Seattle to do a one-year demonstration project of nonresidential onsite organics recycling. Impact Bioenergy is first demonstrating the brewery waste and then the plan is to bring in restaurant waste within the 12-month time period. “Our intention is to just keep it going after the 12-month demonstration,” Allen added.

Once the company begins collecting food waste they plan to deploy a Community Supported Biocycling initiative to cut down on emissions from the trucking of wastes. The company is designing a net-negative carbon collection system that will use an electric cargo tricycle with

electric motor hubs. “We’re going to collect within a 2-mile radius of all of the commercial organics,” Allen said.

In addition to the city grant, another way the project raised funding was through a crowdfunding campaign launched last fall. The campaign raised over $36,000 with over 300 backers. “The response was amazing as far as the interest in this, and it wasn’t just North America it was everywhere,” Allen said. “I think part of the appeal was it was modular and portable, and it was more accessible because people could actually visualize them being built and deployed.”

Allen added that the reason for this fundraising method was partially due to the company’s community-orientated focus. “We were bringing individuals into the equation where an individual could make a difference and we thought crowdfunding is an interesting way to do that,” he said. “The other reason was to communicate that these units are commercially available and that was probably just as valuable as reaching the funding goal.” Allen said that even today, six months later, they’re still getting about one inquiry a day both domestically and internationally.

Impact Bioenergy was initially just looking at North America and the Caribbean, but with the global response is now looking at ways to license and serve a global market. “We have about 13 distributors and we have about 20 collaboration agreements with other companies, so what we’re trying to do is collaborate and partner with other companies to deliver these plants and get them on the ground,” Allen said.

He emphasized that the prefabricated, modular design of the systems reduces many of the risks often associated with large-scale AD plants. Both units require under $1 million in capital, almost no site work is needed and everything is built in Seattle and shipped from there.

According to Allen, the company’s manufacturing schedule is open and they say they can ship a complete machine in about three months after receiving an order. The company is also looking at teaming up for the upgrading of the gas produced from its units to make compressed natural gas vehicle fuel.