



How a HORSE Can Help with Zero Waste Goals

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HORSES are gobbling up waste at a couple Seattle-area restaurants and breweries and turning that waste into renewable natural gas, or biomethane, which can be used for heat, electricity or transportation fuel.

“We’re trying to eliminate or minimize the garbage truck,” said Impact Bioenergy president Jan Allen in an interview. “That is the whole idea.”



No, we’re not talking about the four-legged animal. These HORSEs (stands for High solids Organic waste Recycling System with Electrical output), developed by Impact Bioenergy, are micro-anaerobic digesters that provide on-site generation of energy from food waste and similar organic materials. This can help small- and medium-businesses — or even a corporate cafeteria — reduce their environmental footprint by reducing waste hauling transportation emissions and generating renewable energy.

The Harbour Public House on Washington’s Bainbridge Island recently installed a HORSE that will operate for six months as a pilot demonstration — a partnership between the restaurant, Puget Sound Energy (PSE) and Impact Bioenergy. It will divert from waste bins about 100 pounds of food per day, outputting about 90 percent fertilizer and 10 percent biogas.

Harbour Public House owner Jeff Waite told the Kitsap Sun newspaper that the HORSE will likely mean fewer dumpsters at the restaurant, which are now emptied twice a week. And PSE spokeswoman Karen Brubeck said the goal is to facilitate discussions about a larger, permanent digester on the island.

Meanwhile Seattle’s Fremont Brewery is also testing a HORSE unit, feeding it different brewery waste streams — yeast, hops, grains — and measuring inputs and outputs. Fremont Brewery received a city of Seattle grant for a one-year demonstration project, which will soon also include processing local restaurant waste. Restaurant waste within a couple-mile radius will be collected via an electric bike, which will be powered by HORSE-produced energy.

“This technology goes along with our values,” Fremont Brewery’s Robert Fulwiler said in an interview. “We care about reducing our impact and wasting as little as possible. We use a lot of natural gas in a steam boiler every day, so a longer-term plan would be to generate our own biogas, capture it and inject it into our gas line. If we can reduce the amount of gas we’re using because we’re making it onsite, that would be an awesome thing to do.”

Allen says this is exactly the appeal of the HORSE, which requires 160 square feet of space at a minimum, and the scaled-up version, called the Nautilus, which requires a minimum 400 square feet of space. The units generate onsite renewable energy while reducing waste and associated costs.

“Digesters are usually a \$5 million to \$100 million proposition. Our systems are \$80,000 to \$600,000,” Allen said. “You typically see a payback within five years. It really varies based on your disposal costs your energy costs and the market for the fertilizer. You really have three different value streams: you can avoid having a garbage truck, you can avoid using fossil fuels or grid power, and you can sell the fertilizer. Between those three value streams you can calculate the payback for any specific project.”

Or, he says, customers can take a co-op approach: say, a small brewery installs an anaerobic digester, collects food waste from nearby restaurants and charges them a small fee, thus helping the brewery pay down the cost of the unit.

“It’s especially smart to put food waste and brewery residuals together because post-consumer food waste has really high gas potential,” Allen said.

The systems are portable and modular and can be expanded as needed. The organic waste input for the HORSE is between 1,000 and 6,500 pounds per week, which generates 4kW to about 14kW of electricity and produces 100 to 730 gallons per week of liquid organic fertilizer. The larger Nautilus consumes 1,000 pounds of waste per day and is expandable to 5,000 pounds per day, generating between 280 kWh and 1,400 kWh per day electric output.

“But that’s only electrical output,” Allen said. “Combined heat and power is twice as efficient.”

Allen says the newly launched Nautilus, which is looking for its first commercial customers, is best suited for a large campus: universities, breweries, distilleries, wineries, even municipal solid waste agencies. “We just talked to Rutgers this morning [about installing a Nautilus unit] and we’ve talked to some casino resorts.”

As a growing number of businesses look to reduce or eliminate waste to landfills, digesting it onsite and converting it to renewable energy sounds like a safe bet.

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