

BioCycle

Pilot Anaerobic Digester For SSO

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The Monterey Regional Waste Management District (MRWMD) and Zero Waste Energy, LLC (ZWE) held an open house in late January to unveil a pilot-scale dry anaerobic digester installed at the MRWMD's integrated waste management complex (just north of the City of Marina) to process up to 5,000 tons/year of commercial source separated organics (SSO). When BioCycle visited several weeks later, construction was being completed on the fully enclosed aeration bay for organics receiving and storage. All of the other components were installed, including four SmartFerm digesters, the monitoring and process control skid, biogas collection bladders, percolate capture and recirculation tank and a combined heat and power unit supplied by 2G Energy. The system is designed to generate 100kW of electricity or up to 3,200 cu. ft./ton of biogas with 58 to 60 percent methane content.



MRWMD's Board approved an agreement with ZWE to furnish and install the system under a 5-year demonstration program. ZWE financed the system completely in exchange for the tipping fee revenue for the food waste and yard trimmings processed in the digester, along with revenues from the electrical power sales to the adjacent wastewater treatment plant. "We were looking for a site to install a demonstration plant, and this opportunity came up with MRWMD," says Dirk Dudgeon, Senior Vice-President of ZWE. From the District's perspective, having the digester facility on site provides an opportunity to gain experience with this technology.

"We did a commercial waste characterization study last summer of materials coming to our landfill," says William Merry, General Manager of MRWMD. "About 40 to 50 percent of the waste in the loads we audited were organics. Even though the District's landfill has about 150 years of capacity and the District is well above the state-mandated 50 percent diversion, the District Board believes we need to continue on a pathway to more sustainable practices. It's the right thing to do."

While the starting ratio of food waste to green waste is typically 50:50, the mix can go as high as 70 percent food waste and 30 percent green waste, notes Dudgeon. Each digester unit can hold 60 to 65 tons of material. The SmartFerm system operates in the thermophilic temperature range. Aeration trenches are built into the floor. As soon as the digester door is sealed following loading, the system operates aerobically until the material reaches 125° to 130°F. At that point, the percolate is introduced, and the system switches over to the anaerobic process. "Because our technology operates at thermophilic temperatures, PFRP is achieved in the 25- to 28-day retention time," adds Dudgeon. For digester start-up, ZWE is seeding the percolate tank with liquid cow manure, and processing dry manure in the digesters.