

Dryers are a crucial piece of equipment in the AD industry, helping operators turn their waste into a lucrative business

Turning trash into treasure

Anaerobic digestion is an increasingly popular way to dispose of animal and food wastes. The big advantage is obvious: the ability to generate a gaseous biofuel that can offset natural gas usage. But, many people operating anaerobic digesters inadvertently leave money on the table by failing to understand that the process generates not just one profitable product, but two.

The bugs that turn organic material into methane in a digester never close the deal completely, leaving behind a digestate residue full of organic materials the bugs couldn't process. The digestate contains a good deal of water in addition to those organics. Many facilities treat this material as waste, often sending it to landfills where operators will charge tipping fees of anywhere from \$40 (€33) to \$70 (€59) per ton, depending on the location.

The traditional justification for treating the digestate as a waste is that while the organic material may indeed have some sort of theoretical value, the presence of pathogens and the high moisture content make it impractical to get at that value. Yet, there is another



A rotary dryer ready to ship at Uzelac Industries' headquarters in Greendale, Wisconsin

way — a profitable way — to handle digestate and turn it into a second revenue stream.

The old saying is that one person's trash is another person's treasure. That is the case here. Proper treatment can turn the digestate into a salable product that can be used as a fertiliser or a solid biofuel. There are certain tricks to process digestate effectively, but the challenges have been overcome and many operators are happily making money selling what they used to throw away.

The key is proper drying, which accomplishes two important goals. First, it drives off most of the water, reducing the moisture

content of the digestate. The digestate could have as much as 70% moisture content coming in and is dried to about 10%. The water content adds no value to the end product, so why not get rid of as much of it as possible? Second, provided the drying temperature is high enough, the product qualifies as a Class A fertiliser under applicable US Department of Agriculture standards.

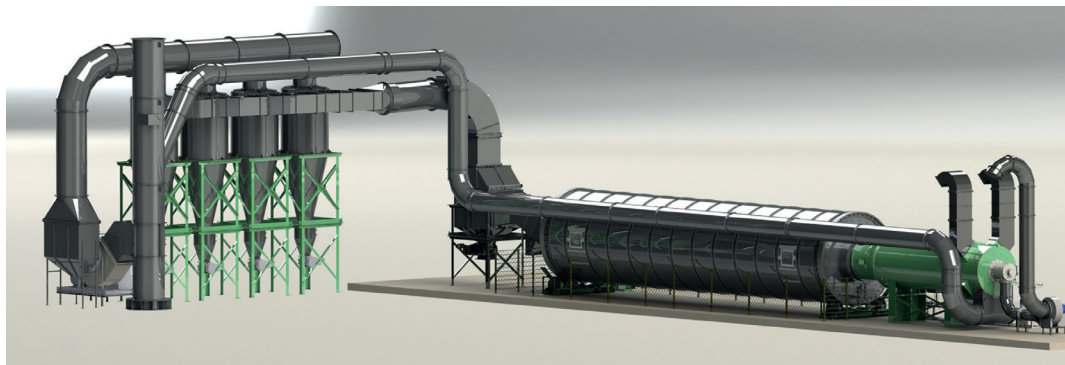
One company that has been a very active supplier of rotary dryers in this kind of service is Uzelac Industries of Greendale, Wisconsin. The company shared some of the financial details of a typical installation,

involving a dryer to process digestate from the anaerobic digestion of poultry manure.

The system was designed to process just over 30,000 tons per year and to operate on a one shift, five days per week schedule. At an installed capital cost of about \$4 million (€3.39 million) and operating costs of about \$400,000 (€339,000) per year, the system will generate over 19,000 tons of fertiliser that can be sold at a net cost of \$145/ton (€123/ton). Doing the maths, that leads to a calculated simple return on investment of about 1.7 years, a figure that ought to make most lenders quite comfortable.

Add-on controls for particulate matter and/or volatile organic compounds are sometimes necessary, depending on the location of a processing system and the characteristics of the waste stream. However, since these systems are often associated with agricultural operations and environmental regulations in rural areas are typically less stringent than they are in big cities, add-on control requirements frequently do not come into play. Whether or not add-on controls are necessary, permitting with the regulatory authority is almost always required before the system can be installed.

One may think of this kind of post-processing as a form of recycling, which is always a good thing. The bonus for the operator is that it's a form of recycling that is good for the planet and the pocketbook. ●



A 3-D model of a rotary drying system created by Uzelac Industries' in-house engineers

For more information:

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