

# Case Study

University of Wisconsin Oshkosh Biodigester



References

The Biodigester at UW Oshkosh is the first industrial-scale dry fermentation anaerobic digester (AD) in the Americas. The facility will serve as a living, learning laboratory for students and faculty and will further the University's goals to create a truly sustainable campus with a net zero impact on the climate and environment.

## Plant Dimensions and Process

Total footprint is 19,000 square feet (storage area 2,000 square feet, mixing area 7,800 square feet). There are four fermentation vessels, each 70' x 23' x 16.7'. Each cycle is 28 days long, with a maximum of 13 material exchanges per year – approximately 150 tons of fresh material per exchange.

## Feedstock

The plant is designed to handle up to 8,000 tons of organics such as food waste, yard waste, and crop residuals per year. Materials are sourced under contractual agreements between the University and its suppliers.

## Odor Control

An enclosed mixing lobby prevents odorous process air from escaping into the environment. The mixing lobby is ventilated with up to 2.6 air exchanges per hour. The process air is released to the atmosphere via a biofilter.

## Financials

- \$3.5 million capital investment.
  - Federal government grant: \$500,000
  - Focus on Energy (State of Wisconsin): \$232,587

## Power Production

- 370 kW<sub>e</sub> continuous power engine (combined heat and power unit), rated at 86.76% overall efficiency
  - 370 kW electric capacity
  - 495 kW thermal capacity
- Average energy production (based on 370 kW in summer, 225 kW in winter months) = 2,320,000 kWh = 7,918 MMBTU
- UW Oshkosh estimates the plant will provide up to 10% of their electricity needs on campus.
 

The plant could provide:

  - Electricity for 210 homes per year. (Average American home uses 11,040 kWh per year), and
  - Energy to heat 180 homes per year. (Average American home uses 43.9 MMBTU of energy per year for space heating)

## Emission Reduction

- Methane displacement: 8,813 metric tons CO<sub>2</sub> equivalent
- Electricity generation from renewable sources: 1,942 metric tons CO<sub>2</sub> equivalent

## Dry and Wet AD Technology in Comparison

Dry AD technology, in contrast to wet AD technology, utilizes higher solids content (25% and above) feedstock, the material stays stationary within the chambers, no additional liquid input is required, and feedstock is moved via front end loader rather than pumped as a slurry. The output can be further composted.

## About BIOFerm™

BIOFerm™ Energy Systems is a member of the Viessmann Group, a \$2.5 billion family owned business since 1917. Viessmann has installed over 30 dry AD and 250 wet AD facilities through the biogas companies of the Viessmann Group. BIOFerm™ Energy Systems was founded in Madison, WI in 2007 and now offers all biogas technologies of the Viessmann Group.



The plant's 370 kW CHP is provided by 2G Cenergy®.