

EUCOline Small-Scale Digester Case Study

Allen Farms in Oshkosh, Wisconsin



Digester Reference

Allen Farms' small-scale, plug-and-play digester, EUCOline, was constructed in 2012 to process industrial food waste brought onsite mixed with manure and bedding from 136 dairy cows. Herd size and a progressive mindset made Allen Farms an ideal partner for the University of Wisconsin Oshkosh, their Foundation, and BIOFerm™ Energy System's installation of the small-scale digester.

EUCOline's implementation opens a new market for U.S.A. facilities producing smaller amounts of waste or with limited footprints.

Plant Dimensions and Process

Allen Farm's digester consists of two fermentation vessels, each measuring 55.7' x 11.5' x 11.5', and a PASCO feeding hopper with 13' x 30' dimensions. Total footprint is ~2,460 square feet, and the system averages a retention time between 25-35 days.

Feedstock

The plant handles ~6,200 tons per year of the farm's manure and washwater, as well as industrial food waste brought onsite.

Financials

- \$1.2 million capital investment
- Focus on Energy (State of Wisconsin) grant: \$125,000
- Wisconsin State Energy Office grant: \$125,000

Power Production

64 kW_{el} continuous power engine (combined heat and power unit)

- 64 kW electrical capacity
- 90 kW thermal capacity

Average annual energy production

- 560,640 kWh electrical production
- 2,680 MMBTU thermal production

Estimated energy from the CHP could

- Provide electricity to 50 homes
- Heat 61 homes per year

Emission Reduction

The methane produced and used is equivalent to the avoided release of:

- 2,312 metric tons CO₂ equivalent

Electricity generation from these renewable sources is equivalent to reducing

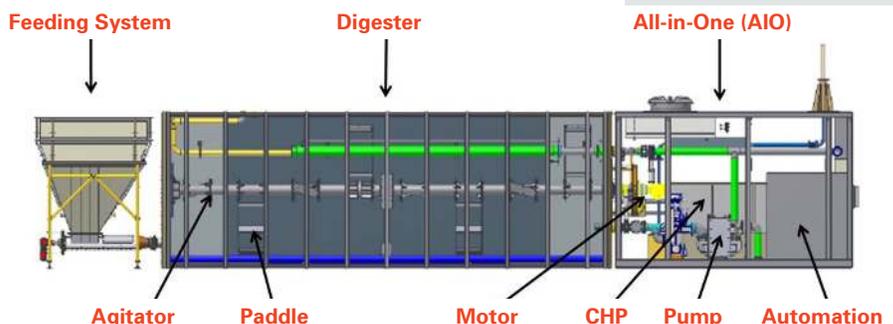
- 529 metric tons CO₂ per year from a conventional bituminous coal facility, or,
- 310 metric tons CO₂ per year produced from a natural gas facility

About BIOFerm™

Based in Madison, Wisconsin, BIOFerm™ Energy Systems is a North American provider of turnkey gas processing and anaerobic digestion systems.

We additionally offer a spectrum of biogas services, such as: gas marketing, financing, project development, regulatory and financial oversight, power purchase agreement assistance, and consulting engineering.

Our company has experience from the installation of over 900 PSA systems (including ~90 Carbotech PSA gas processing plants) and over 450 anaerobic digestion facilities worldwide.



The Technology

EUCOLino - The Perfect Fit for Smaller Operations

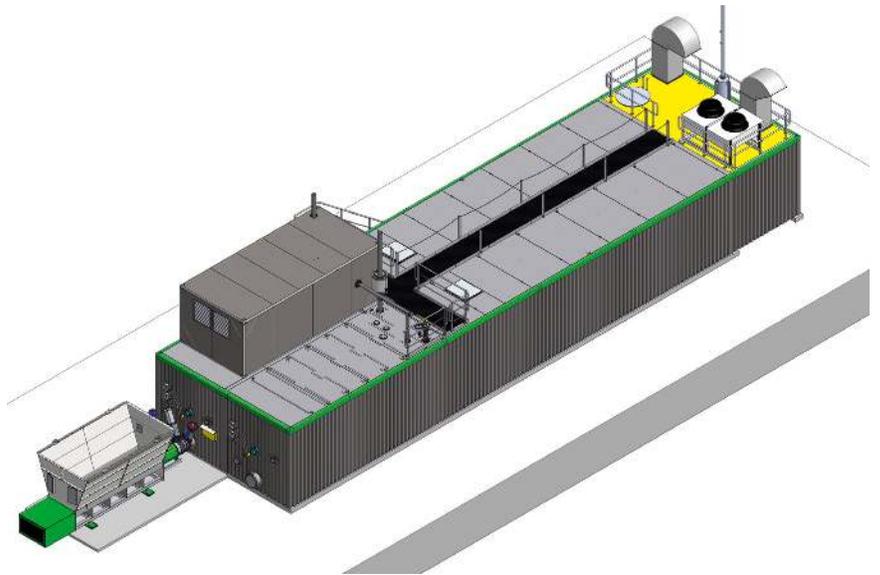
This installation paves the way for other North American operations with limited space or waste streams to turn their waste into power, such as:

- Universities
- Breweries
- Municipalities
- Zoos

The smaller footprint and flexibility in feedstocks make the EUCOLino versatile and easily integrated into existing operations.

Added Benefits

- Continuous supply of renewable electricity and heat
- Odor reduction
- Savings on bedding for farm applications
- Nutrient-rich digestate that can be used on-site or sold as a soil additive providing supplementary income
- Decreased phosphorus and nitrogen run-off
- Reduction in the load size that must be shipped off-site
- Electricity generation from renewable sources to be used on-site or sold back to the grid
- Reduced carbon footprint



Dairy Size (Cow Number)	Electricity Production Potential (kWh/year)	Number of Homes Powered	CNG Gas Gallons Equivalent
100	176,000	13	11,600
150	264,000	20	17,300
200	352,100	27	23,100
250	440,100	33	28,900
300	528,100	40	34,700
350	616,100	47	40,500
400	704,100	53	46,300
450	792,200	60	52,000

**The figures presented in this table are based off of theoretical values and a TS of 15%*