

Anaerobic Digester Case Study

Scenic View Dairy – Fennville, Michigan

The Scenic View Dairy is a dairy farm in Fennville, MI that houses approximately 2200 head of cattle. Prior to the installation of the anaerobic digester, Scenic View utilized sand for animal bedding which has now been 100% replaced by the separated digested biofibers which is 99.9% sanitized and virtually odor free. The methane produced from this system is also of excellent quality (60%) that is utilized in electric generators for on-farm use as well as sold to the power grid for the use of the community. The reduction in methane emissions resulting from the digestion process, as well as emission offsets for replacement of fossil-fuels, will be converted to carbon equivalents, and for additional revenue.



Farm Name:	Scenic View Dairy	Location:	Fennville, MI
Farm Type:	Dairy	Herd Size:	2200 (milking)
Collection Method:	Scraped into reception pit then pumped into digesters.	Bedding Type:	Separated biofibers
Digester Type:	Complete mix	Design Temperature:	100°F
Design Capacity:	(3) 870,000 gal	Date Operational:	2006
Design HRT:	23-28 Days	Current HRT:	23 Days
Design Solids %:	Up to 20%	Current Solids %:	Varies
Biogas Use:	Electricity generation (2) 450 kWh Caterpillars 3412 co-generators	Utility Contract:	Yes, electric
Solids Separation:	Yes	Solids Use:	Bedding
Design/Engineering:	Phase 3 Developments & Investments Biogas Nord GmbH, Sheff & Sons Eng., Theka Associates Eng., Resource Engineering	Utility:	Consumers Power

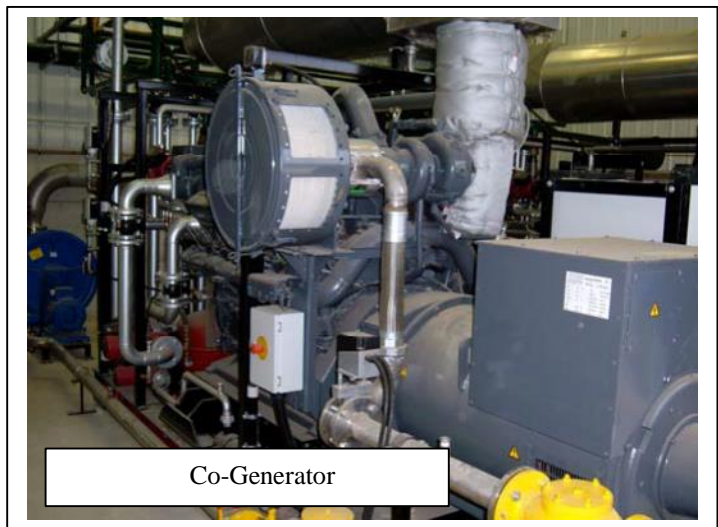
Project Background:

Installation and operation began in 2006 on this complete mix system to enhance the environmental consciousness of the farm's operations. This digester was chosen due to the amount of successful systems already in operation in Germany which include the following features:

- The integrated floor and wall heating ensures even heating of the concrete (very low heat stresses) and a small spread between the heating supply and return (easy to regulate).
- Every fermenter is fitted with a sediment discharge device to allow regular removal of deposited substances.
- Every installation inside the fermenter is made of non-corroding materials (plastic, stainless steel, wood, etc.).
- The insulation is clad with non-corroding and weatherproof aluminum trapezoidal panels.
- Includes a working platform and sight glasses in order to be able to choose the optimum settings for the mixing devices, whose height and direction can be adjusted, and for early detection of process-related biological changes inside the fermenter during operation (e.g. formation of supernatant liquid).
- The double-membrane roof can be opened quickly for maintenance work.



Digester Tank 1 of 3



Co-Generator

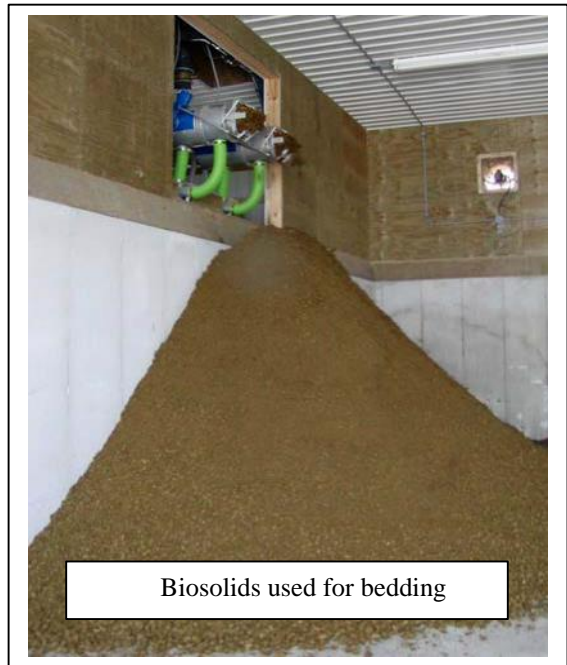
Maintenance Needs:

Construction on this mix tank system took approximately 6 weeks during the spring months of 2006. Utilization of the tanks began in July with energy production beginning in November. This new operation takes approximately 4 hrs per day to manage.

System Costs:

\$500,000 for each digester, \$1 million for the Gensets and \$250,000 on other costs related to solids separation and interconnection. Received a Federal Rural Development Grant for \$474,088 in 2005.

Revenues and Other Benefits: The benefits of this system include utilizing the separated solids as animal bedding, reducing the odor of the effluent, and producing sustainable energy for the farm, as well as to the community. This farm will also experience savings in bedding costs, and solids disposal. It is estimated that the power generated from Scenic View will create energy (electric) for 600 homes. Projected return on investment is 6-7 years.



Biosolids used for bedding