



New York State Energy Research and Development Authority

# Matlink Dairy Farm

## Digester Gas Fueled Engine

DG/CHP Program

Project Profile

Combined heat and power for  
Dairy Farm



### Quick Facts

**Location:**  
Clymer, NY (National Grid)

**Installation Date:**  
July 2004

**Operating Experience:**  
12 months (ending July 2005)

**CHP Equipment:**  
Waukesha IC Engine

**Generating Capacity:**  
145 kW

**Heat Recovery Application:**  
Hot Water and Digester Heater (270 MBtu/h peak)

**Design CHP Efficiency:**  
80% HHV

**Type of Fuel:**  
Digester Gas

**Annual Utility Savings:**  
\$293,000 per year (total net benefit)

**Simple Payback:**  
2.1 years (estimated)

### Overview

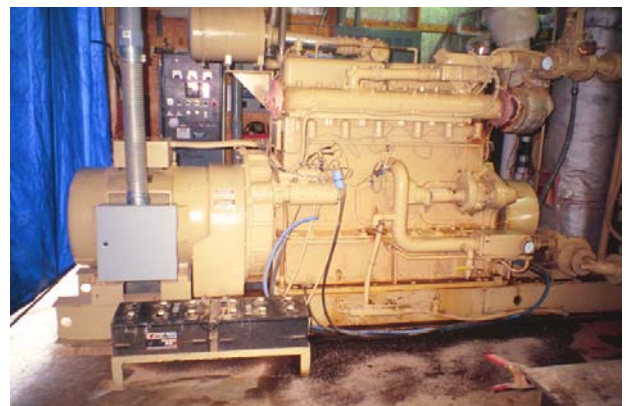
Matlink Farms is a 675 cow dairy operation located near Clymer, NY. The farm is within a mile of the village. Manure was being stored in a lagoon and spread at different times of the year. This caused concern about odors and runoff possibly leaching into the water table.

Matlink Farms addressed these issues by installing an anaerobic digester to dispose of manure and food wastes. Methane gas from the digester fuels a 145 kW generator. Heat from the engine is used to produce hot water and maintain the digester temperature.

### The Application

Manure management is a primary concern for most farms. Matlink Farms installed a digester to alleviate odors and avoid groundwater contamination. Matlink Farms also saw the economic potential of using digester gas in a generator to offset electricity consumption. Additional income results from tipping fees charged to local industries for disposing of food wastes. Inclusion of this material helps increase the methane content (~70%) and quantity of gas produced.

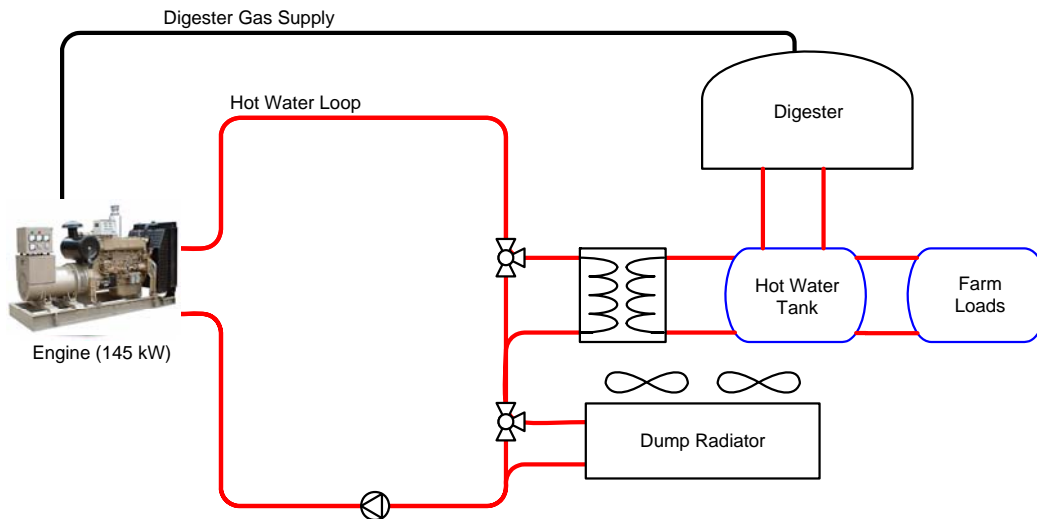
The generator consumes about 30% of the gas. The balance is flared or used for other heating purposes. The generator runs almost continuously; excess electricity is exported to the grid. Heat recovered from the engine is used to maintain the digester temperature. Liquid effluents from the digester are spread on the fields. The remaining solids are composted, dried and used for bedding or sold.



Digester Gas Fueled 145 kW Engine-Generator Set

## CHP System and Equipment

The digester is a 90,000 ft<sup>3</sup> rectangular concrete tank covered with twin rubberized domes. On average, 12,000 gallons of manure (~70%) and food wastes (~30%) are added daily and mixed with the existing contents. The food wastes increase the gas output by three times what could be produced with manure alone. The gas is used in the generator, a boiler or flared depending on immediate needs. Electricity is produced in parallel with the grid; about half is exported for sale. Waste heat is recovered as hot water that is used to maintain the digester temperature (~100°F) and serve other heating loads. Excess heat is rejected to atmosphere through an external radiator.



## Economics and Environmental Benefits

The generator consumes 76,500 ft<sup>3</sup> of digester gas daily and produces about 1 million kWh of electricity annually operating at an average output of 130 kW. The combination of electricity produced, heat offset, tipping fees and other avoided costs yields net savings that approach \$25,000 per month. Complaints about odors have essentially ceased. The pathogen content of the digester effluents has also been substantially reduced alleviating concerns about the residual materials being field spread. Monitored data from the site are available in an hourly format on NYSERDA's DG/CHP website from October 2004 through July 2005.



*Covered Digester and Support Building*



*External Engine Radiator*

## Summary of Benefits

- High CHP efficiency using waste heat for multiple site loads
- Odors and effluent pathogen content essentially eliminated
- Cost savings of \$25,000 per month

“The odor reduction is great, to say the least. Standing downwind of the spreader, the smell is almost a sweet pungent smell.”  
- Ted Mattheuws,  
Matlink Dairy

## Web Links and Further Information:

RCM Digesters –  
Developer/Engineer

[www.rcmdigesters.com](http://www.rcmdigesters.com)

Engine  
Manufacturer

[www.waukeshaengine.com](http://www.waukeshaengine.com)

Other  
DG/CHP  
Resources

[chp.nyserd.org](http://chp.nyserd.org)

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