NYSERDA
New York State Energy Research and Development Authority

Zuber Farms

Biogas-Driven Engine System

DG/CHP Program

Project Profile

Combined heat and power for Dairy Farm

Quick Facts

Location:
Byron, NY (National Grid)

Installation Date:
January 2010

Operating Experience:
18 months

CHP Equipment:
380 kW (on biogas) Engine
(Guascor MGG-712)

Contracted Capacity:
300 kW

Heat Recovery Application:
Digester Heat
House, workshops, and milk house to be heated in future

Type of Fuel:
Digester Gas
Propane for backup / startup fuel

Overview

Zuber Farms is a dairy farm located in Byron, NY. The farm recently installed a heated, mixed tank anaerobic digester to treat manure from approximately 1,550 mature cow equivalents. The digester was designed to handle food waste in the future. Biogas from the digester is used by a reciprocating engine and generator to produce electric power. The power generated is used on the farm or exported back to the local utility via a net metering arrangement. Manure solids, once through the digester, are separated from the liquids and used for bedding and fertilizer.

The Application

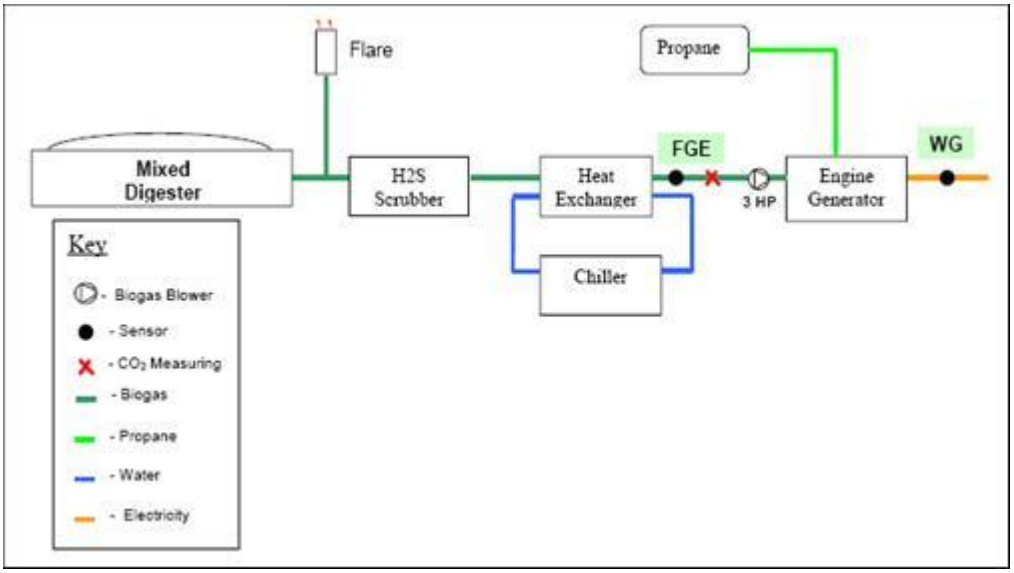
Zuber Farm is a large dairy operation in Cayuga County. In order to control odors and provide better overall manure management the farm decided to install an anaerobic digester. The digester is a heated mixed tank anaerobic digester, designed by RCM Digester.

Fully Mixed Digester

Manure Separator

CHP System and Equipment

Biogas from the digester is either used in the engine or burned in the flare. Biogas being combusted in the engine first passes through the scrubber, which removes sulfur and sulfides from the gas. It is then de watered in a heat exchanger before the booster pump increases its pressure for the inlet to the engine. Exhaust gas from the engine passes through a heat exchanger, where heat is recovered to a water loop that provides heat to the digester.



Schematic of Engine and Digester System

Economics and Environmental Benefits

Currently less than 10% of the biogas produced is being flared. Assuming a cost of 11.5 ¢/kWh, the farm can potentially reduce their electric bills by nearly $25,000 a month when generating at full capacity. With the farms net metering agreement they stand to profit from any unused electricity that they can sell back to the grid, in addition to eliminating their electric bill completely.

Summary of Benefits

- Fully mixed digester uses animal waste; designed to handle food waste also
- Solids are separated from the effluent to provide bedding and fertilizer
- System consistently produces 300 kW; power is exported back to the utility

Cows at Zuber Farms

"Harnessing the waste from dairy farms to produce energy is an effective method of capitalizing on an existing resource to help us meet our …clean energy goal."

~NY Governor,
David A. Paterson

Web Links and Further Information:

Designer

http://www.rcmdigesters.com/

Engine Manufacturer

http://www.martinmachinery.com.mx/

Other DG/CHP Resources

http://chp.nyserda.org/home/index.cfm

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