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FIVE STAR DAIRY FARM – ELK MOUND, WI

SYSTEM DESIGN

Five Star's owner acquired the benefits of anaerobic digestion through an agreement with Dairyland Power Cooperative. Operational since 2005, the above-ground complete-mix digester operates at a target temperature of 125°F. Manure is scraped three times per day from the barns. A mixture of manure and about 10 percent substrate is batched into the digester every half hour. Substrates, such as greases and oils, enhance biogas production and are integral to the design. Five Star Dairy maintains a separate storage tank for substrates.

The agreement served as a business model for similar projects at Norswiss and Wild Rose Dairies.

Dairyland Power buys the biogas and owns/operates the engine-generator set to generate electricity.

As of January 2014, the generator at Five Star is currently offline. Dairyland Power is evaluating gas cleanup issues and maintenance costs.

PROJECT BENEFITS

Solids are separated out after digestion. Most of the solids are used for bedding and some are given away to local gardeners. The project includes the following benefits:

- Provides revenue from biogas sales
- Provides Dairyland Power with a renewable energy source for their members
- Provides digested solids free to the community, which meets a growing interest in using digested solids for gardening and enhances the farm's image
- Reduces odor significantly



Photo: Five Star Dairy

"It really reduces odor (and methane emissions) of the manure and it's another income stream."

—Lee Jensen, Five Star Dairy, quoted in an
Environmental Power fact sheet

- **Population Feeding Digester:** 850
- **Baseline System:** Storage Lagoon
- **Digester Type:** Complete Mix
- **Co-Digestion:** Substrate (high-fat food wastes, such as, greases and oils)
- **Biogas Use:** Electricity
- **Generating Capacity:** 775 kW
- **Receiving Utility:** Dairyland Power Cooperative
- **Project Funding:** USDA