California Energy Commission
Public Interest Energy Research (PIER) Program
Renewable Energy Research

Renewable Combined Heat and Power Dairy Operations

Research Powers the Future
Renewable Energy Research
http://www.energy.ca.gov/research/renewable

September 2011

Fact Sheet

The Issue

In 2009, California's total cash receipts for livestock and livestock products were $7.8 billion, accounting for 6.5 percent of the total U.S. livestock revenue. The state's dairy industry is facing a very difficult time. Due to the economic climate, high costs, and tightening environmental regulations, dairies often relocated to other states or shut down. In 2009, California had a net loss of 100 California dairies and the state's dairy herd declined by 62,000 head.

Anaerobic (oxygen free) digestion and other biochemical/ chemical technologies are potential solutions to manage dairy wastes, produce renewable energy generation, help with operating costs, and provide an environmental benefit. However, dairy digester renewable projects have enjoyed limited success in California. The lack of data on performance, emissions, the price of electricity generation, and the reliability of that power serve as barriers to farmers, investors, permitting agencies, and utilities to pursuing this renewable energy source.

Project Description

This project will test and modify the existing biogas-to-electricity combined heat and power (CHP) system operated at Fiscalini Farms in Modesto, California. The project will collect cost, emissions, operations, and performance data to improve the overall system reliability, affordability, and efficiency. It will demonstrate alternative emission control technologies that are cost-effective and meet current air quality standards.

A 710 kW, 1,057 break horsepower Guascor model SFGLD-560 biogas-fired lean burn internal combustion (IC) engine and generator set is installed at Fiscalini Farms.
Source: Fiscalini Farms

PIER Program Objectives and Anticipated Benefits for California

An objective of the PIER program is to conduct public interest energy research that seeks to improve the quality of life for California's citizens by providing environmentally sound, safe, reliable and affordable energy services and products.

The anticipated benefits of this research are:

- Improved air and water quality.
- Reduced energy costs for California dairies.
- New economic opportunities for the dairy industry.

- Improved electric power quality and power grid support with distributed electricity generation.
- Economic development for many agricultural and rural communities, and job creation.

Project Specifics

Grant Agreement Number: PIR-10-053
Recipent: Fiscalini Farms, L.P.
City/County: Fresno/ Fresno County
Application: Statewide, Nationwide
Amount: $1,500,000
Cofunding: $375,000
Term: March 2011 to February 2015

For more information, please contact:
Zhiqin Zhang, Ph.D.
California Energy Commission
PIER Program, Renewable Energy Research
Phone: 916-327-1397
E-mail: zzhang@energy.state.ca.us

Nettie R. Drake
B & N Enterprises
29415 Ruth Hill Rd.
Squaw Valley, CA 93675
Phone: 559.289.4928
Fax#: 559.344.2410
nettied@psnw.com

Two 82' x 26' anaerobic above-ground digesters are installed at Fiscalini Farms. A nylon material netting under the cover helps create "habitat" for aerobic bacteria to remove hydrogen sulfide presented in the biogas.
Source: Fiscalini Farms

Disclaimer
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California Energy Commission
Chair Robert B. Weisenmiller, Ph.D. | Vice Chair James D. Boyd
Executive Director: Robert P. Oglesby

California Energy Commission
Public Interest Energy Research
1516 Ninth Street
Sacramento, CA 95814-5512

CEC-500-2011-FS-028