

# Anaerobic Digestion: Part II *Canadian-born Projects*

*Cedric MacLeod - Canadian Pork Council*



Clear-Green Environmental Inc.

*Four Capstone micro-turbine engines operating at a Clear-Green Environmental digester installation in Cudworth, Saskatchewan. Turning methane into electrical energy will likely be a practice capable of netting carbon credits.*

With all the talk about anaerobic digesters across the country lately, a two piece story seemed necessary to fully cover the topic. The digester concept was covered previously in Part I of this series in the January edition of Better Pork. The following will be a brief digester tour across Canada with emphasis on a few digestion system projects up and off the ground.

## **Bio-Terre, St. Edwidge, QC**

Swine manure from a 200-sow, farrow-to-finish operation has been operating a biogas plant in Quebec for a number of years. Biogas is produced by special bacteria capable of metabolism at a relative lower temperature than conventional biogas reactors. The system was developed at the Dairy and Swine Research and Development Center of Agriculture and Agri-Food Canada, Lennoxville. Approximately 40 m<sup>3</sup> of methane is produced for every cubic meter of 8 percent solids content manure.

## **Klaesi Farms, Cobden, ON**

The Klaesi brothers have nearly completed their first winter of operating an imported, Swiss-designed, digester system capable of

processing the manure from their 140-cow dairy operation. The system produces 70-80 percent of the electricity required to run the farm and two on-site houses, and enough thermal energy to heat the digester, dairy parlour and houses down to about -5C. Manure is gravity-fed to the digester using the gutter cleaner in the tie-stall barn twice daily. The Perkins engine used to turn the German engineered generator, pictured here, runs on a mixture of digester methane and about 1.7 L of diesel per hour, 10-12 hours a day, to produce 450-500 kW of energy.

## **DGH Engineering Ltd., Bio-Terre, Teulon MB**

After touring Europe and North American digester facilities, DGH Engineering Ltd, began design and construction of an in-ground vessel digester capable of treating the manure from a 6000-head finisher barn, expected to be on line for early spring 2004. The facility was proposed as an odour abatement technology, but is anticipated to produce 500 m<sup>3</sup> of methane daily which will generate hot water using a boiler system in operation year one and electrical energy in year two.

## **Clear-Green Environmental Inc., Cudworth, SK**

Phase one of this two-phase project is complete, with biogas production initiated in early February 2004. The system is designed to process eight million gallons of manure annually from a 1200-sow, farrow-to-finish operation. An agreement with SaskPower will see the utility purchase the digester biogas to fire four 30 kW micro-turbine engine/generator sets, housed at the digester site, for electricity and heat generation.

## **BioGem Power Systems Inc., Bruce, AB**

A 1200-sow farrow-to-finish operation, on an Alberta Hutterite colony, has realized the benefits of a digestion system, built in partnership with BioGem Power Systems Inc, for the past 2 years. The facility is capable of generating 350 kW of electricity per hour. Much is used on site to power the colony with excess sold into the Alberta power grid. Temporary gas storage allows for flexible power export at peak consumption periods, increasing realized revenue. Heat energy is captured and used to heat farrowing units, offsetting natural gas requirements. Further on-site manure polishing produces a dry fertilizer from separated solids and clean water used for barn sanitation.

## **Project Commonalities**

Manure odour and pathogen reductions, electrical and thermal energy production, and the potential for generating carbon credits are benefits quoted by digestion system operators across Canada, and may provide the same for your farm. Several of the systems here are 'Cadillac' models, others are smaller less complex units. The applicability of either option for your operation will depend on a host of factors. Before dismissing the technology as a non-profitable investment, explore your options.

Additional project pictures, information and contact info are available upon request.

