

Genesys Biogas uses 17th century techniques to extract methane from manure

Ottawa-based Genesys Biogas uses anaerobic digesters – containers that generate biogas by coaxing methane gas out of manure – to produce clean and renewable energy

Fast facts

Corporate profile

In the 17th century Robert Boyle, alchemist, philosopher and author of “The Sceptical Chymist”, discovered that decaying organic matter produced flammable gases. Today, Genesys Biogas Inc. applies Boyle’s discovery to produce clean and renewable energy from manure through anaerobic digestion – the breaking down of manure in containers that mimic the conditions inside a cow stomach.

Why Ottawa

Genesys Biogas is located in the heart of Ottawa on Prince of Wales Drive – a scenic stretch of city road that curves around Dow’s Lake, a man-made lake on the Rideau Canal. Dow’s Lake offers visitors and residents year-round fun, including skating, boating and lakeside dining in the centre of the city.

Business advantage

The Ontario government recently announced incentives to would-be biogas producers with the introduction of the Net Metering Program. The program allows farmers generating clean and renewable biogas to reduce net energy costs by exporting surplus generated energy back onto the power grid for credit against the energy consumed from the grid.

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Established in 2005, the Ottawa-based engineering firm develops and builds anaerobic digesters – oxygen-free cement facilities that promote methane production through decomposition of manure to produce biogas. Each year 590-880 million tonnes of methane – a polluting gas – is released worldwide into the atmosphere. About 90% of the emitted methane comes from decomposition of manure and other biomass materials.

Scientists have been interested in discovering ways to capture the energy-potential of cattle manure for centuries. The first major breakthrough towards this goal, after the original discovery in the 17th century, was in 1808 when methane – the principle component of natural gas – was found in the gases produced by cattle manure.

The first anaerobic digester was built in 1859 in India by a leper colony. In 1895 a group of English scientists further developed the technology and used anaerobic digestion to generate gas for street lighting. In the early 1900's, after fossil fuels became readily and easily accessible, the technology was abandoned.

However, in recent years, due to environmental concerns associated with burning fossil fuels, the use of anaerobic digesters has reemerged in the agriculture sector, producing a clean and reliable fuel alternative while also providing a safe animal waste management solution.

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In the spring, visitors and residents enjoy boating, biking and lakeside dining in the centre of the city. During The Tulip Festival, held each year in May, the area surrounding Dow's Lake is transformed into the world's largest display of tulips where festival-goers can walk among the flowers while tasting foods from around the world.

During the winter, Dow's Lake freezes and becomes part of the world's longest skating rink and one of the primary sites of the Winterlude festival – an annual event that celebrates the winter season.

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The use of anaerobic digesters also addresses common concerns associated with animal waste management including odour and water contamination. In anaerobic digesters, the odour from manure storage is eliminated because the odour-causing substrates are broken down in the exact same way as the solids in the manure. Anaerobic digesters also boosts water safety by increasing ammonia content in the digested manure. Increased ammonia content promotes quick uptake from plants, preventing the ammonia from turning into nitrate – a harmful gas that leaches through soil, contaminating water supplies.

Converting cattle waste into biogas also reduces pollutants and greenhouse gas emissions. Methane emissions occur naturally in decomposition of manure and, if not captured in anaerobic digesters, has a global warming potential 25 times higher than carbon dioxide. It is estimated that methane emissions from agriculture animal waste contribute up to 33% of the global greenhouse gas effect. In addition, biogas use reduces carbon dioxide emissions by decreasing demand for fossil fuels.

Future growth plans

In March 2006, the Ontario government announced its intention to pay fixed 20-year prices for renewable energy based on a Standard Offer Program (SOP) to add up to 1,000 megawatts of renewable power to the Ontario power grid. SOP offers 11-cents for every kilowatt-hour produced, with a 3.5-cent/kWh bonus incentive during peak hours.

As a result of SOP, anaerobic digestion for biogas energy production is financially viable in Ontario. Based on the SOP announcement, Genesys Biogas has increased sales and anticipates the growth trend to carry forward as the agriculture sector continues to explore alternative energy technologies.

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