

Electricity conservation on **ONTARIO FARMS**



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ENERGY CONSERVATION AT AN ONTARIO DAIRY FARM

Since arriving in southwestern Ontario from their native Holland 14 years ago, Gerrit and Margriet Wensink have focused on electricity costs as an essential element in running their dairy operation efficiently.

Their energy-conservation ethic was in the forefront over the past year as they built a new 47,500-square-foot dairy barn. Hoenhorst Farms, the Wensink's 320-cow dairy operation near Woodstock, produces more than three million litres of milk a year, and the new barn replaced a 1995 structure that had reached capacity. Construction of the new barn was completed in April 2008.

The new barn deals with two challenges – reducing electricity usage and improving the productivity and health of their dairy herd. “We wanted to maintain the health and productivity of our cows,” Gerrit says. “A healthy cow is a productive cow,” Margriet adds.

The Wensink's new barn was eligible for the Ontario Power Authority's High Performance New Construction (HPNC) program, and the Wensinks received significant financial incentives for energy-efficiency technologies and equipment.

Gerrit emphasizes that farmers considering building a new barn should get technical advice as soon as possible on the available energy-savings technologies and cost savings that can be achieved through the HPNC program and other incentive programs that may be complementary. To get the maximum benefit from energy-efficient technologies, farmers should contact the Ontario Power Authority (OPA), their local distribution company or for new barns, Enbridge Gas Distribution or Union Gas.

The HPNC program is funded by the OPA and administered across Ontario by Enbridge Gas Distribution (which worked with the Wensinks) and Union Gas. Under the HPNC program, farmers building new barns are eligible for financial incentives for installing natural exhaust ventilation, energy-efficient lighting and recirculation ventilation fans. (See story, page 3)

Natural exhaust ventilation – a key savings technology in HPNC – is the major electricity-conservation technology in the Wensink's dairy barn. Ventilation is provided by 16-foot curtained windows supplemented by energy-efficient, high-volume, low-speed vertical recirculation fans. They are coupled with a sprinkler system and smaller box fans that are used for evaporative cooling of the cows during extremely hot weather.

“For most of our lighting and ventilation – except on hot, humid summer days – we rely on natural light and ventilation. It reduces electricity consumption,” Gerrit says.

In front of the Wensink's new barn with natural exhaust ventilation are Fritz Wensink (l.), the OPA's Vicki Gagnon and Gerrit Wensink.



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Gerrit has always been a strong proponent of natural ventilation, and the original barn was built with naturally ventilating walls and gables. “I try to ventilate naturally as much as possible. It doesn’t cost any energy, and it’s definitely better for the animals,” he says.

Additional energy cost savings for the barn have been achieved by installing nearly 70 T5 lighting fixtures. The Wensinks also installed two separate electrical circuits to allow half the lights to be turned off when not needed to further improve cost savings. A photocell is used to control the lights so that minimum light levels are consistently maintained when necessary.



Gerrit Wensink (l.) explains his robotic milking machine to the OPA's Vicki Gagnon and Terry Rothwell.

“Lighting is a major cost in a dairy operation so we are controlling these costs wherever we can,” Gerrit says.

Another area where Hoenhorst Farms has achieved additional electricity savings was with its six robotic milking machines. The milkers have reduced labour costs and improved milk production at the farm.

The new equipment also has moderated the overall electricity cost for the Wensinks because milking is spread out over a 24-hour day rather than being done at specific milking times that are commonly used in the traditional milking system.

Specific milking times trigger higher electrical costs. This occurs partly because peak flow rates – and pumping requirements – for the milk and water are greater. It is also because the milk

cooling and water heating power requirements are higher because the work is being compressed into a shorter timeframe. Traditional start-stop milking means higher peak kilowatt demand and reduced system efficiency.

“This (robotic milking) helps control costs because it levels out the milking periods,” Gerrit says. “Even with comparable electrical demand from our robotic milkers, our energy costs remain essentially better or on par with the traditional dairy operations.”

One of the biggest challenges with the new milking system was to develop routines and protocols to make everything work smoothly and efficiently. “We’re still working out the details to improve production,” Gerrit says.

The Wensinks’ emphasis on reducing electricity costs stems from their European background, “where electricity has always been expensive,” Gerrit says. When the couple moved to Ontario in 1994, the cost of electricity in Holland was nearly three times higher than in Ontario.

To illustrate this point, Gerrit says that several years ago he altered a vacuum pump used in the cooling system to reduce its speed without affecting performance. This saved several hundred dollars in monthly electrical costs.

Gerrit says he is pleased there is growing awareness that electricity costs are one of the most important and controllable cost factors in farm operations. “The program (HPNC) is absolutely positive for the farming community in building awareness of energy efficiency. It makes a difference.”

He looked at various electricity-generating technologies for Hoenhorst Farms, including solar photovoltaic generation and a methane digester, but decided against pursuing these technologies because he prefers to concentrate on his core management objective – improving milk production.

However, Gerrit and Margriet will consider a geothermal heating and cooling system for their home, when their current heating system will need to be replaced.

High Performance New Construction program benefits agricultural industry

Ontario's agricultural sector is the most active participant in the Ontario Power Authority-funded High Performance New Construction (HPNC) program. In its first year, this sector accounted for nearly 50 percent of all accepted prescriptive applications, resulting in 70 percent of the total prescriptive stream savings. Enbridge Gas Distribution is delivering the HPNC program in Ontario, with Union Gas making the program available in its service territory.

The HPNC program offers both a prescriptive stream and a custom stream. Prescriptive agricultural incentives are based on implemented efficiency measures and calculated using interactive worksheets that cover a range of equipment, which includes high-efficiency lighting fixtures, natural exhaust ventilation systems and recirculation ventilation fans. Greenhouses also are eligible for lighting and ventilation incentives.

"The agricultural sector adopted the program very early on," says Susan Clinesmith, Program Manager, Enbridge. "The farming community is very aware of the need to reduce their energy costs to reduce their overall operating costs. They have been very forward thinking in taking advantage of what is available through the program to reduce their energy use."

The average agricultural project in the prescriptive stream is reducing energy usage by about 100 kilowatts (kW), which results in an incentive of \$25,000. Agricultural and other prescriptive incentives are \$250 per verified kW saved.

New building projects that are eligible for design and financial assistance under HPNC include commercial buildings, office buildings, industrial buildings, retail space, multi-unit residential buildings, hospitals, schools and agricultural buildings. Custom stream projects, which require computer energy modelling, are eligible for incentives that range from \$250-\$400 per verified kW saved for the building owner, \$50-\$100 per verified kW saved for the design decision-maker and up to \$10,000 towards the cost of energy modelling.

Details about the program are available at www.hpnc.ca or by calling 1-888-672-4762.

Proposed Feed-in Tariff Program consultations underway

The Ontario Power Authority is hosting a series of consultation sessions with renewable energy stakeholders on the proposed Feed-in Tariff (FIT) Program. The program was announced as part of the proposed Green Energy and Green Economy Act (GEA) introduced to the Ontario legislature on February 23, 2009. The consultations continue until May 12, 2009.

The proposed Feed-in Tariff Program would guarantee specific prices for energy generated from renewable sources and drive green investment to Ontario.

The GEA, if passed, would establish Ontario as North America's leader in renewable energy. The proposed legislation includes a range of measures intended to foster a culture of conservation and encourage the development of renewable energy projects.

The objectives of the proposed FIT program are to:

- increase the capacity of renewable energy supply to ensure adequate generation and reduce emissions
- provide a simpler method to procure and develop renewable energy generation

- create new green industries through new investment and job creation
- provide incentives for investment in renewable energy technologies.

The program will be open to various renewable energy supply technologies (i.e., wind, water power, solar, biomass, biogas and landfill gas). It will provide opportunities for promoting First Nations, Métis and community-based projects.

Farmers are encouraged to learn more about the FIT program and examine opportunities for renewable energy development in their agricultural operations.

Additional information about the proposed FIT program and the consultation process is available at www.powerauthority.on.ca/FIT.