

Electricity conservation on **Ontario farms**



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Lowering the cost of electricity: a financial strategy

With the Canadian dollar at 30-year highs, increasing feed costs and fierce competition in the international pork market, southwestern Ontario swine producers Gerald and Donna Jantzi, like other Ontario hog producers, have seen their incomes drop significantly. The Jantzis' gross farm revenues have fallen by nearly 25 percent since 2005.

The Jantzis, who have operated the family farm in the Kitchener-Waterloo region for over 30 years, recently took time out from running their farrowing and poultry farm to talk about the importance of controlling electricity costs.

With 60 percent of their costs in feed and another 25 percent in labour, reducing their electricity costs has become increasingly important in business decisions.

"We've always been looking at ways to lower the cost of production," says Gerald. "You can't do much at the other end (sales)."

The hydro bill has been a concern, even back in the 1980s when the cost of electricity was eight cents a kilowatt hour (kWh) (compared to 13 cents today), he explains.

With extremely environmentally sensitive animals like pigs, the challenge is to reduce costs without compromising animal comfort and health. Piglets and sows require different temperatures to be comfortable in the farrowing area. Piglets, born on the Jantzi farm where they remain for 18 days, require creep heat temperatures of about 36 degrees Celsius. The sows are more comfortable and maximize their milk production at 18 degrees Celsius.

The traditional method for providing appropriate comfort temperatures for the sow and her piglets is the heat lamp. It has normally operated continuously for the piglet's 18-day post-farrowing period. The lamp is raised and lowered manually to adjust the temperature in each farrowing area to provide as much temperature comfort as possible. Animal comfort is maintained, but there was no way to control the cost.

In the 1980s, when energy-efficient electric heat pads became available, the Jantzis began installing them as the most effective way to reduce energy costs while maintaining the comfort levels for their animals.

The comfort, environment and cost-saving benefits were immediate, says Gerald. A controller on the heating pads allows the heat output to be adjusted as required, reducing energy usage further.

A heat lamp is now only used during the first few days after the birth of the piglets to keep them dry, warm and draw them to the sow for feeding. The use of heat lamps has dropped by 75 percent, from about 20 to five days, explains Gerald.

Gerald estimates the yearly energy savings for each farrowing area is about \$70. With more than 200 farrowing areas, the annual savings for the Jantzi farm is about \$13,400 when compared with relying solely on heat lamps. Although the initial cost of a heating pad ranging from \$150 to \$200 is higher than a heat lamp (average \$30), the improved animal environment and lower energy cost soon outweigh the higher initial cost. A 60-watt heat pad reduces electricity use in the farrowing area by about 630 kWh per year compared to a heat lamp.

The OPA's Vicki Gagnon examines energy-efficient heating pads at Jantzi farms.



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He estimates an additional \$20 savings in electricity is achieved by monitoring the heat level the first days after birth. Heat pad controllers allow the staff to adjust pad heat. The stockman gradually adjusts the temperature downwards according to comfort levels required. Although the farrowing barn is highly automated including temperature controls and feeding, “the final determination of comfort levels is based on the stockmanship of the people working in the barn. From experience and knowledge of the animals, they can tell whether it is too hot, too cold or just right.”

The Jantzis reduced their yearly electricity costs by another \$5,000 to \$6,000 by installing six new energy-efficient exhaust fans, replacing the existing 10-year-old fans in their poultry barn. The six new fans, ranging in size from 18 to 36 inches, are 30 to 50 percent more efficient. The installation was completed this past spring. The new ventilation system in the barn has significantly reduced the potential for overheating that could seriously affect the comfort of the chickens.

In addition, they were able to cut more electricity costs in the poultry barn by replacing the old-style box heaters with less costly gas-fired radiant heaters.

Gerald began cutting his lighting cost in the swine barn when he converted from incandescent lights to florescent lights, first installing older, T12-type lamps and replacing those with the even more efficient T8s when they became available. In the poultry barn, 40-watt incandescent bulbs are used with dimmers to reduce cost. “We’ll start to replace these when dimmable fluorescents become available,” says Gerald.

Looking at energy trends on the farm, Gerald expects to see more farm energy-generating projects in the near future. “It will be an additional source of farm income.”

“We’ve enough nutrients here to power the place without needing to sell to the grid,” he says. He has looked into the possibility

of wind power and anaerobic digester energy generation on his farm. “But, right now, the technology is too expensive. They’re further ahead in Europe because the price for electricity is much higher than in Ontario. It’s for the next generation.”

Gerald says energy costs will become an increasingly more important element in farming in the future – more than ever before. Young farmers should seriously consider building dual ventilation barns – natural ventilation combined with small minimum winter ventilation fans. “Always think about installing the most energy-efficient equipment. In the long run, it will save money. Digesters may be too expensive today, but it is a technology waiting to happen.”

He predicts economic opportunities will significantly increase for Ontario farmers to participate in their own energy-generation process.

Where to get information about energy-efficiency technology for farms

The Ontario Power Authority
www.powerauthority.on.ca/

Financial incentives for farmers planning to install approved heat pads, heat pad controllers and cut-out thermostats and energy-efficient florescent lighting systems are available through the OPA’s Electricity Retrofit Incentive Program (ERIP).

For more information, please contact your local distribution company (LDC). A list of Ontario LDCs is available at www.everykilowattcounts.ca.

Ontario farmers seeking information about anaerobic digesters including financial assistance should contact the Agriculture Information Contact Centre at **1-877-424-1300** or **email: ag.info.omafra@Ontario.ca**.

Readers’ survey: What you told us

We asked you, the readers of *Electricity conservation on Ontario farms*, for your feedback and suggestions for future articles. Your response was positive. Readers generally found the material interesting and relevant to their farm operations.

Most readers wanted to see more articles about energy production, specific energy-efficient technologies and the real-life experience of farmers who have installed and used these technologies on their farms.

Among the specific suggestions for future articles were:

- energy efficiencies and incentives in the greenhouse sector
- anaerobic digesters
- energy efficiency in a hen-laying operation
- how to become a farm electricity generator including cost analysis.

The suggested topics will be addressed in the upcoming issues.

To the readers who took part in our survey, thank you. Your participation is invaluable in helping make *Electricity conservation on Ontario farms* a relevant and important source of information for Ontario farmers.

Report confirms technology improvements save money

A study on energy use in the Ontario agriculture sector, entitled “Demand Side Management (DSM) Lessons Learned Energy Program,” has found recent improvements in energy-saving technologies produced significant cost savings for Ontario farmers. The DSM study was funded in part by the Ontario Power Authority.

The broad goal of the DSM study was to prove that energy usage could be reduced by 10 percent through a combination of conservation, efficiency and load shift.

Comprehensive energy audits undertaken at different types of farm operations found that energy volumes were reduced by more than 10 percent through conservation (natural gas and electricity), efficiency and electricity load shifting.

The energy audits – focusing primarily on dairy, swine and poultry operations – focused on the following types of farm operation: feed milling and grain drying; cash crop, swine and poultry farm; dairy farm with windmill; mushroom farm; fish farm; fruit storage and processing facility; and grain elevator and dryer. The savings identified through these audits ranged from \$11,800 at the dairy farm to \$84,000 at the fruit storage and processing facility.

Among the efficient energy-savings technologies identified in the DSM study was the heat pad for swine operations. The problems plaguing the earlier designs – broken cord, pad breakage and water entry – have been overcome.

In the accompanying story, “Lowering the cost of electricity: a financial strategy,” swine farmers Gerald and Donna Jantzi have seen their electricity costs drop significantly by installing heat pads.

The improved technology of heat pads was tested at another swine farm in southwestern Ontario, confirming what the Jantzis discovered on their own farm – the heat pad designs are now more durable, and the heat pads available in Ontario resist damage from a sow’s extended leg and water penetration.

The study showed that the creep heat pad control systems have evolved significantly from other older, less reliable models.

The report found that most Ontario swine producers are unaware of these new products and their potential savings. Demonstration of these products was required to show their energy-savings potential and other benefits including improved performance and payback.

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Based on the DSM study audits as well as audits conducted by the Ontario Ministry of Agriculture, Food and Rural Affairs, a number of technology opportunities for Ontario farmers have been identified. These energy-savings opportunities can be viewed at www.omafra.gov.on.ca. Information about energy-savings technologies is also available at <http://www.energybenchmark.com/Greenhouse2/index.php>.

Eight additional agricultural pilot projects have been selected to provide more energy-conservation information and verify system performance. These sites, which have been equipped with data-logging systems, include: swine creep heat pads, daylight harvesting (poultry), dual ventilation (poultry), fruit storage demand management, geothermal heat system (poultry), light harvesting (dairy), variable frequency (speed) drive on milk vacuum pump (dairy) and greenhouse boiler reconfiguration.

The DSM report also identified additional areas where demand side management programs should be applied, including training for electrical and mechanical contractors, incentives to promote energy-efficient opportunities, expansion of the conservation culture and continued development of conservation programs.