

# Electricity conservation on Ontario farms



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## Finding energy savings in the farm home

**W**ith the average annual Ontario farm electricity bill at \$4,000 and at some farm operations reaching over \$40,000, the price of electricity is one of the most important issues facing Ontario farmers.

As farmers look for ways to control energy costs, the potential energy savings in the farm residence may be overlooked.

The Ontario Power Authority is partnering with local electricity distribution companies to bring all Ontarians – whether they live on a farm, in town or in a major city – financial incentives that will save money on residential energy costs and strengthen the province's electrical power system.



### Instant cash rebates

Beginning on April 23, more than 4.6 million Ontario homeowners will receive the Every Kilowatt Counts brochure containing energy-saving information and instant rebates on energy-saving products.

The money-saving coupons include \$5 off any outdoor motion sensor or solar light; \$3 off any dimmer switch, the purchase of three or more furnace filters or any ENERGY STAR<sup>®</sup>-qualified compact fluorescent lights; and \$25 off any ENERGY STAR<sup>®</sup>-qualified ceiling fan.

The coupons are redeemable at more than 3,000 stores in more than 400 communities. Coupons expire on June 17, 2007. The stores are listed at [www.everykilowattcounts.com](http://www.everykilowattcounts.com).

### Summer savings saves 10 percent

With the Summer Savings program, residential customers who lower their electricity use by 10 percent between July 1st and September 1st receive an additional credit on their upcoming electricity bill.

No sign up is necessary, some exclusions apply.

### The Great Refrigerator Roundup Program

Because refrigerators and freezers have a long lifespan, they often continue to be used in homes as secondary appliances. But the cost of operating an old, energy-inefficient refrigerator is typically high.

To encourage Ontarians to get rid of their old energy-inefficient refrigerators and freezers, the Great Refrigerator Roundup Program will provide free in-home pickup of the old units and recycle them in an environmentally responsible manner.

Additional information about the program, expected to start in June, will be available at [www.powerauthority.on.ca](http://www.powerauthority.on.ca)

### Cool Savings on Your Heating and Cooling System



Home air conditioning represents a significant electrical demand and, on extremely warm days, strains the province's power system.

The Ontario Power Authority's Cool Savings Rebate Program offers financial incentives to reduce electrical consumption from air conditioners and cut energy costs. Ontarians who have their central air conditioning system tuned-up by June 30th will get \$50 off the tune-up price. When an old central air conditioner is replaced with an ENERGY STAR<sup>®</sup>-qualified system, the consumer will receive \$350. Homeowners can get a \$750 rebate when they purchase a central air conditioning system that exceeds the ENERGY STAR<sup>®</sup> standard along with a high-efficiency furnace equipped with an electronically commutated motor.

An ENERGY STAR<sup>®</sup>-qualified, high-efficiency heating and cooling system can help save up to 40 percent on an electricity bill.

To qualify for a rebate, a participating heating, ventilation and air conditioning contractor must complete the work. Full details are available on the program Web site, [www.coolsavingsrebate.ca](http://www.coolsavingsrebate.ca) or at 1-877-797-9473.

### peaksaver™ – an energy management tool

Consumers will receive \$25 from the Ontario Power Authority when they have a **peaksaver** remote control device installed by their local distribution company on their central air conditioning system. During peak summer demand periods, the local electricity distribution company can remotely contact **peaksaver** devices to reduce the amount of electricity each air conditioner uses, thereby reducing the total demand on Ontario's electrical system.

There is no cost to registering for the **peaksaver**.

More information is available at [www.powerauthority.on.ca](http://www.powerauthority.on.ca).

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# Energy efficiency: a way of thinking at Clovermead Farms

**Energy efficiency has been an economic driver at Clovermead Farms for nearly 30 years, explains Bruce Whale, the fourth generation Whale to farm the 425-acre site in south-central Ontario.**

**B**ruce, his wife Deborah and their son Korb operate the 300 head (125 milking) dairy farm. The farm, near Alma, Ontario, produces 1.3 million litres of milk, 80 veal calves as well as 386 acres of alfalfa, corn and mixed grain annually. The remainder of their land is forested.

Since the late 1970s, energy efficiency has played a major role in financial decisions affecting the farming operation. The farm had an energy-output/input balance performed in 1976 and a complete energy audit in 1989, “and we began looking at what we could do better to save money,” explains Bruce.

Since then, energy costs at Clovermead have been reduced through energy-efficient lighting, natural ventilation, milk heat recovery, switching from vertical to horizontal silos for feed storage and ventilation heat recovery. The Whales are now considering building an anaerobic digester to produce their own electricity and heat.

Energy-efficiency technology was introduced to Clovermead farms in the early 1980s with a heat reclaimer on the milk cooler compressor. The reclaimer – now standard energy-savings technology on most dairy farms – can save up to 40 percent of electricity used in cooling milk.

Bruce’s son Korb is the driving force behind the anaerobic digester – the Whales’ most ambitious energy project. The 1,000-cubic-metre digester will convert organic materials including manure from the dairy barn, agriculture residues, organic materials, corn and alfalfa into methane gas. The biogas will be burned to produce heat and electricity for the farm’s two farmhouses and dairy barns.

The Whales have also been looking at selling the excess biogas to Union Gas or as electricity to Ontario’s power grid. About 25 percent to 35 percent of the energy in biogas is normally converted to electricity. A digester isn’t economical with fewer than 300 cows, so Korb is looking at other sources of feedstock materials to improve the economics.

“The project makes sense. It takes away pathogens, takes away the smells, still produces nutrients for the plants, provides electricity for ourselves and neighbours and no pollution,” says Korb. Construction of the digester is expected to begin this summer.

The milking process along with milk cooling is one of the farm’s biggest energy costs, followed by lighting and heating water. The farm’s annual electricity use is 177,000 kilowatt hours including electricity use in the farm home, which represents about 15 percent of the farm’s total electricity use.

In the 1980s, to cut lighting costs in the dairy operation, energy-inefficient incandescent lamps were replaced with compact fluorescent lamps (CFLs). “We switched to compact fluorescent lamps as soon as they became available,” explains Bruce.

There were problems with the durability and brand diversity of CFLs, but “they still saved money.” It is estimated that convert-

ing from incandescent to fluorescent lamps can reduce energy usage by as much as 75 percent. The Whales improved their lighting efficiency again when they switched to metal halide lamps from compact fluorescent lamps when the new dairy barn was built.

While the electricity cost for lighting the barn remained the same, the new metal halide lamps provided more lighting in a larger barn and helped improve milk production. Bruce expects to upgrade barn lighting efficiency once again when the ballasts in the metal halides begin to fail. “It doesn’t take long to recover the cost of the new ballast.” He normally expects a three- to five-year payback on investments in energy-efficient projects.

For over 10 years, the Whales have also relied on timers to turn lights on and off to save on their energy costs. They allow more control. It is better management of energy costs, he explains. The introduction of plate coolers for in-line pre-cooling of milk



**Terence Rothwell (right), project manager for OPA agriculture program design, and Korb Whale of Clovermead Farms, discuss the energy efficiency of the plate heat exchanger (shown in the upper left section of the photo), used for precooling the milk with cool well water before it enters the 10,000 litre milk tank.**

also cut energy costs. Cooler milk entering the milk tank means less (cooling) compressor running time. The coolers can drop the temperature of the milk even more when used with variable speed drives, further cutting energy costs.

Bruce continues to advocate for natural ventilation in barns to cut electricity costs. “It’s a no brainer with either chicken or dairy barns,” he says. “Why run fans if the wind will do it. Open a few curtains and let the environment do it.”