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Case Study:
Cavendish Farms

Thorough approach to energy efficiency brings big savings to Prince Edward Island

Cavendish Farms is a potato processor in Prince Edward Island. It makes french fries and other potato products by heating them to very high temperatures and then flash-freezing them for packaging and shipping. Since the process requires a large amount of energy, learning how to reduce the use of fuel and electricity is an effective way to cut operating costs.

In 2002, company staff began to educate themselves about how to achieve their energy efficiency goals. A group attended Dollars to $ense, Natural Resources Canada's (NRCan's) energy-management workshops, and learned how to reduce the use of energy in large-scale food-processing operations.

With encouragement from NRCan's Canadian Industry Program for Energy Conservation, and by designating an energy efficiency champion within the company, Cavendish Farms was able to meet two important goals. First, it performed key energy efficiency audits that led to a noticeable reduction in the cost of doing business. Second, it created a corporate culture within the company that encouraged employees to embrace energy-efficient practices both at work and at home.

Highlights

- Saved $1 million a year in energy costs
- Heightened employee awareness of energy efficiency

Objective

In 2001, when energy costs began to increase noticeably, managers at Cavendish Farms started to discuss whether an energy efficiency program at the company's two plants on Prince Edward Island could work. Paying millions of dollars a year in fuel and electricity bills, management believed there was room to reduce energy consumption and cut costs by refining industrial processes and upgrading equipment.

CIPEC Canadian Industry Program for Energy Conservation

Canada

Company profile

Cavendish Farms, with headquarters in Dieppe, New Brunswick – and with sales offices in Toronto, Montréal and Boston – is a leading producer of frozen potato products for retail and food-service markets around the world. Two food-processing plants in Prince Edward Island employ 570 people.

Energy use profile

Cavendish Farms spends several million dollars a year on energy. Until recently, Plant One in Prince Edward Island – built in the 1960s and operating with older equipment – was by far the larger consumer. The plant is over 25 000 square metres (275 000 square feet), employs 450 people and spends $12 million a year on energy: $7 million for fuel and $5 million for electricity. Typical plant functions include steam-peeling, sorting, blanching, drying, deep frying and freezing potatoes, as well as pumping water and hot oil to ensure rapid circulation of the liquids during processing.

Plant One's deep fryer is filled with roughly 15 000 litres (3300 gallons) of cooking oil. In addition to a $95-an-hour cost to heat the oil, Cavendish operates two 75-horsepower electric motors that circulate the oil. A blancher holds roughly 38 000 litres (8360 gallons) of water, circulated through a steam-heat exchanger to maintain the temperature. A 5000-horsepower engine room powers the plant's freezing tunnels and cold storage units.

Plant Two, also in Prince Edward Island, was built in 1996 and requires fewer upgrades because it is relatively new.

Project profile

After conducting nearly two years of research into energy efficiency options for the two facilities in Prince Edward Island, Cavendish Farms' Plant Engineer, Wayne Wilson, was named the company's energy efficiency champion. Having attended NRCan's Dollars to $ense workshops, he began in 2003 to hold regular meetings about creating a cohesive energy efficiency plan in the company.

"We began to meet on a regular basis to identify projects that would give us the best return for our investment," says Mr. Wilson. In 2004, Cavendish Farms registered with NRCan as an Industrial Energy Innovator, which reinvigorated the company's focus on energy efficiency. Cavendish Farms learned a great deal from the program, and more change was to come on the heels of a thorough energy audit.

Energy audit

In 2004, Cavendish Farms hired Neill and Gunter – a New Brunswick company of design and consulting engineers – to perform an energy audit of its operations at Plant One. The audit identified several energy efficiency projects that, once implemented, would make a noticeable difference to the company's bottom line. Projects included using a stack economizer on the plant's boiler, installing various heat recovery systems and repairing and replacing defective steam traps.

The plant's Director of Operations approved the audit findings, and Plant One engineers then approached senior management for capital to implement the upgrades. When final approval was received in 2005, Neill and Gunter was hired to complete the design work.

Results

	Energy Efficiency Upgrades	Energy Savings
Heat-recovery	• The boiler received a thorough cleaning, which removed dirt and scale. • The boiler was retrofitted with an economizer that captures and uses waste heat in the boiler's flue gas to pre-heat the water entering the boiler.	7 percent
	• A heat-recovery system was installed on the deep fryer and blancher to capture waste heat for use elsewhere in the plant.	3 percent for the heat-recovery retrofit on the fryer 3 percent for the heat-recovery retrofit on the blancher
	• Twenty defective steam traps were replaced. Steam traps release condensed steam from a heat exchanger but prevent the loss of live steam. Ensuring they work properly improves the overall performance of a plant's steam system.	1 percent
Electricity	• The refrigeration unit received an automated control system that responds to pressure, instantly detecting – and responding – when products need refrigeration.	5 percent
	• Variable frequency drives were installed on some of the plant's larger ventilation systems.	50 percent

Overall, the upgrades reduced energy costs by $1 million a year. With an initial investment of $1.25 million to implement the upgrades, Cavendish Farms benefitted from a 14-month payback period.

Following the successful upgrades at Plant One, some improvements were also made at Plant Two.

Secondary benefits

The energy upgrades at Cavendish Farms have had a positive effect on the company's corporate culture. The audit approach has encouraged employees to think more about energy efficiency.

As part of an overall strategy to promote energy efficiency in the company, Cavendish Farms invited a utility company to Plants One and Two to mount a display for employees. The display detailed measures that employees could adopt at home to reduce their personal use of energy. Cavendish Farms believes that being vigilant about energy at home can improve awareness of energy issues in the workplace.

The Cavendish Farms energy efficiency committee meets once a month to review progress, assign follow-up tasks and decide on future steps. While management has traditionally staffed the committee, it will soon expand to include input from employees who routinely operate the plant's machinery.

Critical success factors

The energy audit process at Cavendish Farms was successful because the company

- made a commitment to energy conservation;
- designated an energy champion and provided the tools to implement the project;
- hired consultants with the appropriate expertise; and
- followed through on the consultants' recommendations.

"When upper management saw the benefits in black and white, they gave us the approval to do it," says Mr. Wilson. "The fact that our projects have led to measurable savings means they're likely to give us more money to improve things further."

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