



## Air Liquide Canada Inc.

### Project

Reduce electricity consumption by up to 6.4 million kilowatt-hours annually to save \$500,000 at Air Liquide's Hamilton air-separation plant by maximizing the use of the most energy-efficient unit.

### Principal

Air Liquide Canada, Hamilton, Ontario

### Background

Air Liquide's Hamilton air-separation plant – the largest in Canada – produces 4,000 tons/day of gases for steel, medical and other industrial customers. The company operates three air-separation units on its 14-acre site.

The major cost in the air-separation process is the cost of electricity, says Keith Rowan, Director of Operations for Air Liquide's Canadian operations. "Seventy per cent of operating costs are electricity. Probably no other business has as high a portion of their costs in electricity."

The company's continuing focus has been to reduce electricity costs, Mr. Rowan emphasizes.

The Hamilton operation is a cryogenic plant that produces nitrogen, oxygen and argon as gas, as well as liquid products by using very low temperature distillation to separate and purify these components of air. The three air-separation plants each have different electricity efficiencies, depending on their age and capacity.

Electricity is used to drive the compression equipment and in-process heaters, instrumentation systems and cooling systems.

The Ontario Power Authority (OPA) through Air Liquide's local distribution company, Horizon Utilities Corporation, provided \$120,000 for the customized project under its Electricity Retrofit Incentive Program (ERIP). The total cost of the project was \$1.2 million.

### Implementation

A 2007 analysis of electrical costs associated with each of the three plants showed that by expanding the production capacity of the "biggest and newest" and most energy-efficient plant, production from the older and less-efficient plants could be done with 6.4 megawatt-hours less electricity annually; a savings of \$500,000. "We would be using an inefficient plant about one-third less time," Mr. Rowan says. "It would enable us to run more product at a lower cost and less product at the higher cost."

The key to expanding production capacity on the larger more energy-efficient unit was the availability of a surplus compressor from another Air Liquide plant. "If we hadn't the surplus compressor, the project would not have been considered," Mr. Rowan says.

The company began rebuilding the compressor to fit the specifications of the 2000-ton air-separation unit in late 2007. The compressor was fully operational by July 2008.

### Financing

Air Liquide's LDC, Horizon Utilities told the company about funding incentives available under the Ontario Power Authority's Electricity Retrofit Incentive Program (ERIP). ([everykilowattcounts.ca/erip](http://everykilowattcounts.ca/erip))

The company's rebuilt compressor project fit ERIP's customized incentive category under which all technology, equipment and systems are evaluated on the basis of their electrical demand reduction. The incentive offer of \$150/kW is based specifically on the level of electricity demand reduction. The OPA raised the limit for financial incentives for customized projects under ERIP to \$250/kW.

The ERIP financing provided 10 per cent of the total value of the project - \$120,000.

Air Liquide invested \$1.2 million in rebuilding and installing the compressor, including building the foundation, rewiring, control modification and linking the compressor to the air-separation unit. The ERIP incentive helped reduce payback for the project to a little more than two years, Mr. Rowan says.

### Results

The annual cost savings for the new project is \$500,000 and 6.4 million kilowatt-hours of electricity a year.

"The investment in rebuilding and installing the compressor and new controls gave us the electricity savings we thought we would get," Mr. Rowan says.

### Lessons Learned

Mr. Rowan says that after Horizon Utilities alerted the company about the ERIP financial incentives it then worked with Air Liquide to prepare the application to obtain the funding "They (Horizon Utilities) have a strong commitment to helping customers to save money."

While Air Liquide has significant internal company expertise focusing on "optimizing energy efficiency" other industries and businesses where electricity is one of many costs might consider using the services of external energy-efficiency consulting firms, he says.

Mr. Rowan points out that the cost savings represent the continuing emphasis the plant puts on improving energy efficiency. "We monitor energy ratios at this plant continuously to help evaluate more ways to reduce costs. We are looking at all kinds of ideas for future reductions."

Improvements range from better insulation to making process improvements. Mr. Rowan says that in the last 10 years energy efficiency at the plant has increased by about 30 per cent. "And we can improve more."

To learn about the ERIP program, please visit [everykilowattcounts.ca/erip](http://everykilowattcounts.ca/erip)