

Hydro-Québec's Home Page

 Major Customers
 Energy Efficiency
 Home Page

Success stories

[Ciment Québec](#)
[Cascades](#)
[Molson](#)
[Kruger](#)
IBM
[Université de Sherbrooke](#)

Customer success stories

IBM launches a ground-breaking demonstration project



To meet its energy consumption reduction objectives, IBM has turned to new solutions for cooling process water.

As a participant in Hydro-Québec's Industrial Initiatives Program – Major Customers, IBM has focused on different innovative technologies, including the NOVANERGY phase-change thermal storage system developed by the Groupe Énerstat.

The process developed for IBM's Bromont plant is the first of its kind in North America.

State-of-the-art thermal storage system

The thermal storage system consists of two phase-change material (PCM) storage tanks, which act as both energy storage banks and heat exchangers.

The storage system has an instantaneous cooling capacity of 2,500 tons.

Depending on the load, the refrigerant discharges the thermal kilowatthours from, or charges it to, the storage system.

Variable-frequency drive (VFD) chiller

IBM opted for a VFD chiller with a rated capacity of 1,500 tons, the largest chiller of its kind in Canada.

The chiller cools the thermofluid and supplies the thermal storage tanks and plate heat exchanger.

Free cooling

The Bromont plant was already using natural, or free, cooling, which now operates in series with the thermal storage system. This allows the plant to take advantage of natural cooling roughly nine months a year rather than only three months as in the past.

The free-cooling heat exchanger uses outdoor air to cool the process water. When the outside temperature is too high, the water is channeled to the main exchanger which, thanks to the thermal storage system, brings the cooling load down to roughly 100 tons.



Results of the implementation of this pioneering project

Reduction in electricity
consumption =
5,312 MWh/year

Reduction in
electricity bill
\$350,000/year

Financial assistance in the amount of \$300,000 from Hydro-Québec contributed to the project's success.

Advantages of thermal storage system

- Substantial improvement in chiller efficiency
- An additional 3,000 hours of free cooling
- Reduction in peak loads
- 50% reduction in refrigerant use
- 50,000,000 Btu stored during each charging cycle

“Thanks to the contribution from the PCM banks, the use of the free-cooling system was increased by 300%.”

– Daniel Paré, consulting engineer, IBM



From left to right: Peter Bisset and Daniel Paré, IBM; Jacques Cécil, Hydro-Québec; and Stéphane Bilodeau, Groupe Énerstat.