**FACT SHEET**

# *25 years of innovation*
# The Hydro-Québec research institute's energy technologies laboratory, LTE

Inaugurated on November 6, 1987, in Shawinigan, LTE is one of the leading laboratories in Québec and in North America dedicated to the efficient use of energy.

- Annual budget of $11 million
- Over 100 research projects per year
- Some 60 employees, including 36 researchers

## Mission
Help Hydro-Québec's customers Improve their energy performance.

### Areas of expertise
*Building energy*
Innovations designed to optimize the energy consumption of residential, commercial and institutional buildings.

*Industrial energy*
Innovations designed to help industrial firms optimize their use of energy through new technological solutions and electrical processes.

### Areas of innovation
- Energy efficiency
- Demand-side management
- Energy use
- Renewable energy sources
- Ground transportation electrification
- Distributed generation

### Recognized expertise
Over the years, LTE researchers and their collaborators have won numerous awards, and their work has earned distinctions from both national and international organizations. LTE researchers are also regularly asked to participate in international conferences as experts.

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# Achievements for a better use of energy

LTE works actively to promote the efficient and profitable use of electricity by Hydro-Québec's residential, commercial, institutional and industrial customers.

## Home Diagnostic
LTE played an instrumental role in developing the Home Diagnostic, which has become the standard Hydro-Québec tool for analyzing the energy use of residential customers. The Home Diagnostic report provides recommendations and customized measures to help customers reduce their consumption.

## Electronic thermostats
LTE helped confirm the energy savings resulting from the use of electronic thermostats. In LTE's dual-climate chambers, where the temperature can be set anywhere between –30°C and +30°C, it was demonstrated that using electronic thermostats can result in savings of 10% in annual heating costs.

## Three-element water heaters
In its laboratories, LTE tested a water heater with three elements that are less powerful than those of a conventional two-element water heater. The three-element unit works in a way that reduces the power demand for water heating at peak periods by 15%, making it a sustainable choice.

## ThermElect
In collaboration with a manufacturer, LTE designed an electric central heating system that stores 15 times more energy per unit volume than water at 100°C, using an arrangement of high-density ceramic bricks. Designed for the commercial, institutional and industrial sectors, the system can store heat during low-demand periods and release it during peak periods, thus lowering the customer's electricity bill.

## Wood drying with high-frequency waves
LTE helped develop a process using high-frequency waves in a vacuum to dry lumber. Using this high-tech approach, the time needed to dry wood is far shorter, sometimes a few hours rather than a few days, and the dried wood is of higher quality.

## Plasma-assisted sludge oxidation (PASO)

LTE has developed PASO, a process for treating organic sludge from pulp and paper mills, farms and sewage treatment plants by means of a rotary kiln and plasma torch. This technology has the advantage of consuming less energy than conventional processes. Moreover, the residual sludge is 95% more compact, and the remaining 5% can be used.

## Building energy simulation (SIMEB)

LTE has developed SIMEB, software for modeling the energy consumption of an existing or planned commercial building in order to evaluate the effects of potential efficiency measures. SIMEB is the prescribed tool for Hydro-Québec's Buildings Program and is also available for use in the design or upgrade of high-performance buildings.

## Waste management decision support tool (MATTEUS+)

LTE has developed a decision support tool for municipalities and companies that want to assess the costs and potential benefits of treating and deriving energy from organic wastes using various processes (anaerobic digestion, composting, gasification, etc.).