HYDRO-QUÉBEC
The Lithium-Metal-Polymer battery: reliable and environmentally friendly

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Abstract

Hydro-Québec is about to put an innovative battery on the market, the Lithium-Metal-Polymer battery. First intended for the telecommunications sector, the LMP battery could find application in the energy sector (nuclear) and in sustainable transportation as an essential component of electric vehicles.

The result of about 20 years of research with various international partners, the LMP battery is made up of four thin laminate materials: a metal lithium sheet serving as an anode, a solid polymer electrolyte, a metal oxide cathode, and an aluminum sheet to collect the current. The result is an entirely solid electrochemical cell without any liquid or jellified electrolytes.

Three times more compact and five times lighter than conventional valve-regulated lead-acid (VRLA) batteries, the LMP battery also has a superior performance and lifespan. It does not require any maintenance, is able to withstand extremes in temperature, and is equipped with a local and remote monitoring system. It also allows continuity of service to be ensured at least cost.

In 2002, Hydro-Québec set up AVESTOR jointly with Kerr McGee Chemical LLC in an aim to market the LMP battery technology. The world's first LMP battery manufacturing plant is located in the province of Quebec in suburban Montreal. Mass production of the batteries will begin in 2004. They will target the telecommunications sector where those in charge of fixed networks, wideband fibre-optic cable networks and wireless networks use batteries in the event of an outage on the main electrical system.

AVESTOR is also developing a battery intended for electric vehicles as part of a cooperative agreement with the Société de Véhicules Électriques, a subsidiary of the French groups Dassault and Heuliez. Thanks to its technological advances, Hydro-Québec is working on reducing greenhouse gases associated with ground transportation in accordance with the objectives of the Kyoto Protocol.