

Wonder Battery Drives Canada into the Green Economy

Quebec becoming an industrial platform for advanced Lithium-ion batteries

LiFePO₄ W₄WER
PERFORMANCE BATTERY MATERIAL

A Canadian company's innovative research into rechargeable batteries continues to attract significant investment from abroad. Süd-Chemie, a leading specialty chemistry company based in Germany, first invested in Phostech Lithium in 2005. Now, just four years later, Süd-Chemie's total Canadian investments have reached \$13 million and it stands as the 100% owner of Phostech Lithium.

A safer battery

Phostech Lithium's production plant in St. Bruno, Quebec, produces and sells LiFePO₄, a material used in advanced lithium-ion batteries.

Lithium-ion batteries are most commonly found in consumer products such as cell phones, laptop computers, cameras, and cordless power tools. In less than 20 years, the market for this battery has become an 8 billion-dollar business.

The popularity of these batteries lies in their superior energy-to-weight ratio and their relatively slow loss of charge when not in use. In addition to portable electronics, lithium-ion batteries are growing in popularity for use in defense, automotive, and aerospace applications due to their ability to deliver high-power.

The safety of lithium-ion batteries, however, is a concern for both manufacturers and consumers. "The main reason for inadequate safety," says Thorsten Lahrs, Phostech's CEO and Manager of the Battery Materials Business Team within Süd-Chemie's Energy and Environment Business Unit, "is the cathode material currently used, which is based on cobalt oxide." As a result, lithium-ion batteries can ignite or explode.

The LiFePO₄ material produced by Phostech replaces cobalt oxide, resulting in what is now referred to as "advanced lithium-ion batteries." "We have been able to bundle the know-how available in Phostech and Süd-Chemie to successfully develop a significantly more powerful, intrinsically safe, long-cycle life battery," explains Lahrs. Phostech's iron-based cathode material is also environmentally friendly.

The wonder battery is born

Phostech's cathode material - LiFePO₄ - will play a critical role in what has been touted by environmental technology watchers as the "wonder battery."

"LiFePO₄," notes Lahrs, "is proving instrumental for large lithium-ion battery deployment in such green technologies as the e-bike, e-scooter, hybrid electric vehicle, plug-in hybrid electric vehicle, and the electric-drive vehicle, not to mention its huge potential for energy storage associated with renewable energy deployment."

"LiFePO₄ is the material of choice for plug-in and electric vehicles, not only because it allows for a smaller, lighter battery pack, but also because it offers



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Phostech Lithium



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uncompromised safety,” says Lahrs. According to Phostech, the first hybrid electric vehicles with lithium-ion batteries are due to enter the market in demonstration fleets within the next twelve months; and the market should begin to grow substantially towards 2012 and onwards.

Phostech’s St. Bruno plant began to produce LiFePO₄ in 2006 with 20 employees and a 400 metric-ton capacity. Since then, Phostech has nearly doubled its staff in St. Bruno, with employees working in production, support, marketing, and research and development.

LiFePO₄ is already used commercially in a range of products, from electric bikes, wheelchairs and medical scooters to lawn mowers, power tools, electric vehicles (Microcar M.GO electric), and defense applications. “LiFePO₄ allows for a safe, non-toxic, lightweight, long-cycle life battery with low self-discharge rate, so we see substantial growth potential in this market,” says Lahrs.

Research brings its rewards

Süd-Chemie’s Canadian investment also yields access to highly qualified engineers and scientists. Before acquiring Phostech, Süd-Chemie had three North American research and development locations. Quebec now complements this network.

Phostech was initially founded by a group of researchers at Université de Montréal, one of whom was Dr. Michel Gauthier, Phostech's President. “The success of the new technology, the favorable context for R&D in Canada, and the dynamism of Université de Montréal's researchers inspired Süd-Chemie to fund an Industrial Research Chair at Université de Montréal, jointly with NSERC (National Sciences and Engineering Research Council of Canada).”

The combination of leading-edge research and a leading-edge LiFePO₄ manufacturer in Canada creates an exceptional opportunity for the country to play a major role in what experts see as an upcoming surge in activity linked to electric transportation and large lithium-ion deployment for storage of renewable energy. The innovative research and development around lithium-ion is also likely to attract and support other related green businesses in Canada.

For more information on Süd-Chemie and Phostech Lithium’s efficient and environmentally sensible technologies, visit www.sud-chemie.com and www.phostechlithium.com



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Phostech Lithium

Why a German Giant Chose Canada

Germany's Süd-Chemie Inc. recently celebrated 150 years of innovation and dynamic progress, as well as five decades of investment in the United States.

In 2005, Süd-Chemie made its first investment in Canada by initiating a relationship with Phostech Lithium, a company established in 2001 by a group of Quebec scientists working at Université de Montréal.

"We were initially attracted to Canada because of Phostech Lithium's innovative work with lithium-ion," explains Lahrs. It wasn't long, however, before we saw the significant benefits of investing in Canada: a friendly investment environment, world-class universities, seasoned technical workers, and a first-class infrastructure."

"Canada has developed at breathtaking speed from a commodities-based nation to a modern industrial nation. As a result, its gross domestic product has increased by 25% on a per capita basis over the past ten years. No other G8 country has achieved such growth and we wanted to be a part of that."



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