The race for lithium technology intensifies as new opportunities are seized

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Lithium ***technology*** *companies are vying to enter the rapidly accelerating North American battery* ***metals*** ***supply*** *chain , either by becoming manufacturers of*

battery precursor materials or providers of direct lithium extraction technology potentially disruptive.

Vancouver-based Nano One Materials Corp (TSX: NANO; US-OTC: NNOMF) announced on May 25 the acquisition of lithium iron phosphate (LFP) cathode materials manufacturer Johnson Matthey Battery Materials Canada for 10 .25 million dollars.

***The acquisition includes equipment, facilities, equipment, land and other assets** , bringing the team to bear over 360 years of commercial production and scale-up knowledge.*

In particular, the facilities include a 2,400-tonne-per-year LFP plant in Candiac, Quebec.

The company stresses that the plant occupies one-tenth of the property's 400,000-square-foot property, leaving ample room for expansion.

"The rapidly expanding need for responsibly produced cathode materials in North America represents an opportunity for Nano One to deploy its technology and become a leader," said Nano One CEO Dan Blondal.

He described the initiative as a *"critical link in the mines-to-mobility initiative."*

The acquisition is fully financed and carried out without cash or debt, subject to certain working capital adjustments. The transaction is expected to be completed before 2022, subject to JMBM Canada meeting contractual commitments and other customary closing conditions.

Johnson Matthey acquired the Candiac plant in 2015, which has been in operation since 2012. It supplies cathode material to the lithium-ion battery industry for automotive and non-automotive applications for a select group of customers.

*The company hopes that its strategic location in Quebec will give it the advantage of access to a North American ecosystem, **which will serve the global community at large with cost-effective, resilient and environmentally sustainable cathode materials.***

At $2.31, shares of TSX-traded Nano One gained 42.2% in early trading on May 25, giving it a market capitalization of more than $200 million. Yet within 12 months, the stock is down 47%.

Direct extraction technology

For his part, physicist-chemist Jack Lifton, who is credited with coining the term "technological metals" in 2007, explains to The Northern Miner that he is excited about a direct lithium extraction technology that a company in which he participates , One World Lithium (US-OTC: OWRDF; CSE: OWLI), has recently obtained a license from the US Department of Energy.

The scientist considers that the newly licensed technology vertically integrates the production of lithium carbonate for batteries directly from brine in a single reactor.

The problem is that the patents granted by the Department of Energy are still very recent and, with the license agreement just executed, One World is looking for a brine source on the ground to test its kit.

"As a mining company, we continue to focus on potential properties of merit that may contain recoverable lithium on a commercial scale, from a wide range of concentrations," Lifton said in an interview.

"We can vertically integrate such a deposit into the company to include the highest value-added form of that commodity, focusing on an advanced direct lithium extraction process for the extraction and separation of lithium from natural brines , directly generating carbonate of lithium ," he said.

"In short, we will focus on developing properties as assets that will further our ability to offer low-cost lithium separation and direct production of battery-grade lithium carbonate."

The extraction method uses unique carbon dioxide injection mixing techniques to quantitatively precipitate lithium carbonate from brines . This process does not require solvents, electrodes, membranes or sorbents. It only uses carbon dioxide from industrial waste, exhaust gas streams or even ambient air.

Significantly reduces capital and operating costs, process time, energy needs and, paradoxically, total carbon dioxide emissions.

According to Lifton, the process is fully deployable and operational at the brine source , eliminating the need to evaporate brines and/or transport brine concentrates to a chemical processing facility to form and purify lithium carbonate. The deployment of this technology will reduce dependence on foreign lithium sources.

However, it joins a growing circle of lithium technology-focused companies hoping to commercialize their particular brand of direct extraction technology. The test, however, is whether any of these companies can go from successfully demonstrating lab-scale testing to demonstrating the economic value of the new technology in a field application.

At 3 cents a share, One World shares are down 71% in the past 12 months, giving it a market capitalization of $5.4 million.

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