Nano One Materials and Rio Tinto Forge a Western Supply Chain Blueprint for LFP Batteries

written by Tracy Hughes | October 8, 2025

Nano One Materials Corp. (TSX: NANO | OTCQB: NNOMF | Frankfurt: LBMB), a Canadian process technology company pioneering cathode innovation, has taken another deliberate step toward reshaping the global battery supply chain. In its latest announcement, Nano One revealed that it has successfully pre-qualified lithium carbonate from Rio Tinto Ltd. (NYSE: RIO | LSE: RIO | ASX: RIO), one of the world's largest mining groups, for use in its patented One-Pot™ lithium iron phosphate (LFP) cathode active material production process. The collaboration reflects a growing recognition that technological innovation and raw material integration must evolve together if Western economies are to challenge China's dominance in LFP battery materials.

The LFP cathode—a key component in cost-efficient, long-life lithium-ion batteries—is foundational to the next wave of electric vehicles and grid-scale energy storage systems. What Nano One and Rio Tinto are pursuing is not just product compatibility; it is a re-engineering of the industrial architecture that underpins the clean energy transition. The companies are pre-qualifying Rio Tinto's battery-grade lithium from its Fenix site at the Salar del Hombre Muerto in Argentina, where a ten-tonne C-sample has already been processed by Nano One for pilot and customer validation work. Additional lithium carbonate from Rio Tinto's Olaroz and Rincon operations is advancing through Nano One's qualification protocol—progressing

from kilogram-scale A-samples to tonne-scale C-samples. This multi-stage system, ranging from A to D qualification, ensures reliability at commercial scale and accelerates the pathway to customer adoption by up to a year.

The technological centrepiece of Nano One's strategy is its proprietary One-Pot™ process, which merges the multiple stages of cathode material synthesis into a single, continuous chemical reaction. The company argues this approach can reduce costs, energy intensity, and waste while simplifying environmental permitting. In a field where conventional LFP production often involves complex precursor manufacturing and chemical waste disposal—frequently outsourced to Asia—the One-Pot™ system is both an engineering and strategic statement. It enables localized, modular production of LFP cathode material without dependence on imported intermediates.

Alex Holmes, Chief Operating Officer of Nano One, emphasized the strategic dimension of this work: "We are adding value to our technology and license offering by pre-qualifying feedstock that is critical to the production of LFP. This will assist our prospective licensee partners manage supply chain risks and accelerate time to market for future One-Pot commercial plants." In practical terms, this means Nano One's future partners could deploy its technology with confidence that the lithium feedstock—sourced from a major, reliable producer like Rio Tinto—has already been validated for performance and quality.

This alignment of upstream and downstream capabilities represents an emerging model for Western critical mineral strategy: integrate the mine, the process, and the end-use technology into a single framework that ensures both resilience and scalability. Rio Tinto's presence adds industrial weight to this vision. The miner has declared ambitions to grow its lithium output to over 200,000 tonnes per year of lithium

carbonate equivalent by 2028, positioning itself as a key player in the hemisphere’s lithium supply. By coupling that production capacity with Nano One’s process innovation, both parties stand to benefit from a shared market narrative centered on secure, sustainable LFP supply.

Contextually, this partnership comes at a time when lithium iron phosphate batteries are enjoying a global resurgence. Once dismissed in favor of higher-energy nickel-manganese-cobalt (NMC) chemistries, LFP has now reclaimed a dominant share in the global electric vehicle market, particularly among mass-market models. Its intrinsic safety, lower cost, and stable thermal performance make it ideal for both mobility and stationary energy storage applications. Analysts estimate that LFP batteries accounted for nearly half of all global EV battery deployments last year, with adoption accelerating as automakers from Tesla, BYD, and Stellantis pivot toward the chemistry’s economic advantages.

The challenge for North America and Europe, however, lies not in demand but in production. **China currently manufactures more than 95% of global LFP cathode materials**, leveraging decades of cost optimization, low-cost feedstocks such as ferrous sulfate, and flexible environmental oversight. Replicating this ecosystem in the West has proven expensive, with higher raw material prices, regulatory constraints, and the absence of localized know-how adding significant cost barriers. In this environment, Nano One’s technology—coupled with Rio Tinto’s resource base—may offer one of the few credible pathways to regional independence.

By eliminating the need for precursor intermediates and liquid waste streams, Nano One’s One-Pot™ process sidesteps the wastewater and permitting hurdles that have delayed many Western cathode projects. This is not merely an environmental advantage; it’s a competitive one. A process that uses less water, fewer

reagents, and standard industrial inputs like lithium carbonate and iron phosphate could dramatically improve the economics of local production. Nano One's demonstration plant in Candiac, Quebec, acquired from Johnson Matthey in 2022, serves as the pilot platform for commercial scaling. There, the company is proving out its "design-one, build-many" licensing strategy—where its process can be licensed to multiple global partners, each deploying identical modular production units tailored to local supply chains.

For Rio Tinto, participation in this ecosystem extends its influence beyond the extraction of lithium. It transforms the company's role from commodity supplier to strategic enabler of downstream technology adoption. In a world increasingly defined by energy security and supply chain sovereignty, such integration strengthens its long-term value proposition. With governments in Canada, the United States, and Europe now deploying subsidies to localize cathode and battery manufacturing, the Nano One–Rio Tinto partnership positions both companies at the intersection of policy, technology, and industrial strategy.

Still, Nano One's progress should be viewed through a realistic lens. Despite multiple high-profile collaborations—with Rio Tinto, **Sumitomo Metal Mining Co. Ltd. (TSE: 5713)**, and **Worley Ltd. (ASX: WOR)**—the company remains in pre-revenue development, with commercialization expected to advance gradually as partners adopt its technology. However, its cumulative funding from the **Government of Canada**, the **Government of Québec**, the **Government of British Columbia**, and **U.S. federal programs** underscores official recognition that this innovation serves a national interest: establishing a North American foothold in an otherwise monopolized market segment.

What this collaboration signifies, more broadly, is that

industrial innovation in the energy transition will increasingly be driven not by scale alone, but by the ability to integrate materials science, resource security, and process efficiency into unified ecosystems. For the Western critical minerals sector, the Nano One–Rio Tinto partnership offers a glimpse into how that future may be built—one verified sample, one qualified process, and one strategically aligned alliance at a time.