

Nano One Advances Commercial Plans for LFP and Other Cathode Materials

written by Raj Shah | April 24, 2023

Highlights and Milestones:

- *Nano One's technology, manufacturing hub and plans represent a game-changing opportunity to secure sustainable and clean battery supply chains in North America.*
- *Nano One's systematic plans jumpstart the commercialization of its One-Pot process starting at 200 tonnes per year in 2023, expanding in steps to 2,000, 10,000 and hundreds of thousands of tonnes per year.*
- *\$40m in cash, \$10m in grants and multiple proposals for additional government support.*

April 24, 2023 ([Source](#)) – [Nano One](#)® Materials Corp. (“[Nano One](#)” or the “Company”) (TSX:NANO)(OTC PINK:NNOMF)(Frankfurt:LBMB) is a clean technology company with patented processes for the production of lithium-ion battery cathode materials that enables secure and resilient supply chains by driving down cost, complexity, energy intensity, and environmental footprint. The Company is pleased to provide an update on its innovation, piloting and commercialization plans for lithium iron phosphate (“LFP”), nickel-rich (“NMC”), manganese-rich (“LNMO”) cathode active materials (“CAM”), and outlines how this will drive growth.

“Cathode materials are the most expensive and strategically important part of the battery,” said CEO Mr. Dan

Blondal, “because of the critical mineral and raw material inputs, and the related processes to combine them. We must develop and commercialize new processes to become masters of our own supply chains and to avoid the pitfalls of entrenched and outdated processes in use today. Contrary to emerging narratives, a secure and reliable LFP supply chain can be built entirely within the context of North America, and it is incumbent on governments to incentivize short, medium, and long-term investment in the development of large-scale domestic cathode production.”

Nano One is addressing the call for increased security of supply, environmental stewardship, and responsible raw material sourcing. Its objective is to capture a meaningful portion of large emerging CAM markets starting in North America, then to expand in Europe and the Indo-Pacific region, all looking for cleaner and more cost-competitive cathode production solutions.

Mr. Blondal added “The cathode market opportunity is extraordinary, with production volumes projected to grow, in North America for instance, from thousands to over a million tonnes per year, within a decade. We are laying a solid foundation to address these opportunities and to bring increased value to our shareholders. It begins with a strategy that leverages our newly acquired facility in Candiac, Québec which is the only LFP production plant and most experienced operational team in North America. Candiac jumpstarts the commercialization of the One-Pot process in hundred, thousand and ten thousand tonne steps and this will set the stage for rapid expansion to hundreds of thousands of tonnes.”

LFP, NMC and LNMO Pilot Plans

To expedite commercial sampling, offtake and first revenues, Nano One’s newly acquired Candiac facility in Québec is being

retrofitted with its new One-Pot reactors and technology, and will be commissioned initially at 200 tons per annum (“tpa”) in Q3 2023, ramping up to as much as 2,000 tpa.

“I was involved in the first commercial production of LFP, more than a decade ago, right here in Québec,” commented Chief Commercialization Officer Mr. Denis Geoffroy, “and it is exciting to be at the cutting edge once again, with an experienced team, bringing a new generation of LFP and other CAMs to market. One-Pot simplifies production and I believe it will enable Nano One and our partners to produce the cleanest CAM while driving down costs and building the most localized and secure supply chains.”

Nano One will launch LFP in North America, followed by Europe and the Indo-Pacific region, giving it access to hundreds of thousands of tons and exponential revenue growth, to power hundreds of gigawatt hours of battery storage and millions of EVs. It begins with a first-of-a-kind commercial-scale LFP production facility, using Nano One’s proprietary One-Pot process that leverages its know-how, equipment, land, people, and shareholder support.

Mr. Geoffroy added, *“We are conducting trials in the existing Cadiac plant, benefiting from idle reactors with LFP batches that are a hundred times larger than we can do at our innovation center in Burnaby, British Columbia. Results are encouraging, making this a major acceleration since we took ownership of the facility 6 months ago. This comes with valuable learnings for our engineering and operational teams that will help us hit the ground running as we bring the new One-Pot reactors online later this year.”*

Nickel and manganese based cathode materials play an equally important role in Nano One’s growth strategy, and the company is

applying its technologies and collaborating with multiple strategic partners to address the need for greater supply chain security, cost reductions, and environmental protection. To this end, Nano One also has engineering work underway for a separate 100 tpa NMC and LNMO pilot facility. Having piloting capabilities for LFP, NMC and LNMO will enable Nano One to prototype, validate, engineer and pilot a new generation of CAM and accelerate the commercial adoption of its One-Pot and sulfate-free metal-direct-to-CAM (M2CAM®) processes in pursuit of production, joint venture and licensing opportunities.

LFP Commercial Plans

Product from piloting will be sent to partners and potential customers for validation, qualification, offtake and possibly first revenues, and will also inform the design, construction and operation of Nano One's LFP Commercial Demo Plant.

In parallel to the Pilot activities, engineering is underway for a green-field Commercial Demo Plant, the purposes of which will determine (a) the optimal capacity for a single production line, (b) the maximum number of lines that can be constructed on the undeveloped land at the Candiatic property and (c) the unit of production and basis for much larger automotive-scale multi-line LFP production facilities.

Nano One COO Mr. Alex Holmes said, *"The Pilot and the Demo Plant will be launch pads for evaluation, training, offtake, production, first revenues and rapid growth to meet the needs of our collaborators, partners and growing list of potential customers. To feed this growth, we are partnering with critical mineral and raw material providers to reduce waste, water, cost, and energy intensity while strengthening domestic supply chains."*

Nano One intends to build the Commercial Demo Plant adjacent to

the existing Pilot facility, subject to engineering results and available utilities. Preliminary estimates indicate that a single line will have a capacity of approximately 10,000 tpa representing a five-fold increase over the Pilot facility. A more detailed engineering study is underway and will inform Nano One on capital costs, the optimal line size, and maximum capacity on its undeveloped land. Nano One is planning to begin with a single production line and currently believes that it may be able to fit up to two additional lines as the LFP market grows and as local infrastructure can support it.

This plan could enable hundreds of millions in revenue during Nano One's initial years of commercial operations while also enabling demonstration of its technology to the market, potential licensors, joint ventures, and investors, at a scale relevant to automotive OEM and renewable energy storage interests.

The resulting production line will be the blueprint, or modular building block, to replicate in multi-production-line facilities, in the future, with capacities that could range from 50,000 to 100,000 tpa. Nano One's LFP Pilot and Commercial Demo Plant facilities will serve as a "centre of excellence" to train future plant operators, to facilitate continuous improvement and to offer Nano One's customers, partners and licensees access to experienced implementation teams, engineering, procurement, construction and operation to de-risk investments and ensure a secure and stable supply of LFP.

Mr. Holmes added, *"The acquisition of Candiatic last year accelerated our commercialization plans quite remarkably and opened the door to address the LFP market head on, using our One-Pot technology and deeply experienced operating team. Our value proposition to partners now goes far beyond a technology solution and will offer turn-key engineered production lines,*

experienced implementation teams, training for future plant operators, and continuous improvement validated through a rigorous scaling program. We believe this approach will enable rapid large-scale expansions while reducing the capital at risk, and the lead times to production, and ultimately it will improve the bottom line for our stakeholders.”

In preparation for the Commercial Demo Plant, Nano One will focus on:

- Supply chain security – active discussions underway with key raw materials suppliers for commercial needs with a goal to source 100% from within North America.
- Customer offtake – active discussions underway for validation and customer qualification leading to offtake with small and medium volume LFP customers.
- Project finance – advanced planning underway with public and private sector project finance providers complemented by future customer and strategic investor discussions.
- Permitting, operational readiness planning and implementation underway.

The North American Advantage

The LFP inputs are iron, lithium and phosphorus; all of these can be sourced in North America and volumes have the potential to grow with market adoption by OEMs. There are large-scale automotive quality volumes of class 1 iron metal being produced in North America by Nano One’s partner Rio Tinto and there are sources of lithium carbonate and phosphoric acid expected to come online as the LFP market grows. This will keep North American critical minerals from being shipped overseas, providing EV producers and consumers with security of supply and Inflation Reduction Act (IRA) credits while being cost

competitive and environmentally differentiated.

Corporate Overview

Nano One's core technologies are its One-Pot and M2CAM processes that enable the production of various CAMs (NMC, LFP, LNM0) directly from class 1 sulfate-free metals (i.e. iron and nickel metal powder) and lithium carbonate. By compositing metals, lithium and coating materials in one innovative process, M2CAM drives down cost, complexity, energy intensity, water usage and environmental footprint.

This eliminates:

- the need to convert lithium carbonate to lithium hydroxide,
- the costly chemical conversion of metals to intermediate metal sulfates,
- the co-precipitation of those sulfates into a precursor (PCAM),
- all of the subsequent wastewater and sodium sulfate by-product,
- the subsequent lithiation steps,
- GHG and energy-intensive thermal processing steps, and
- The need for additional coating steps.

Nano One is also expanding its facilities in Burnaby, BC to increase its thermal and wet processing capabilities for continuous improvement on performance, throughput and energy intensity.

The Company has approximately \$40M in treasury and it is also accessing \$10M in non-dilutive funding from Sustainable Development Technology Canada to support piloting projects and engineering at its Candiatic facility. The Company continues to

seek support from various government programs in Canada and the United States while targeting strategic parties for partnership and investment.

“We are committed to innovation and environmental sustainability,” said Mr. Blondal, “and poised for significant growth. I am confident that our technology will be a driving force in the transformation of the battery material supply chain and the future of energy storage. We will continue to execute on our plans and look forward to enhancing value for our customers, partners, collaborators, and shareholder base.”

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About Nano One®

Nano One Materials Corp. ([Nano One](#)) is a clean technology company with a patented, scalable and low carbon intensity industrial process for the low-cost production of high-performance lithium-ion battery cathode materials. With strategic collaborations and partnerships, including automotive OEMs and strategic industry supply chain companies like BASF, Umicore and Rio Tinto. Nano One’s technology is applicable to electric vehicles, energy storage, and consumer electronics, reducing costs and carbon intensity while improving environmental impact. The Company aims to pilot and demonstrate its technology as turn-key production solutions for license, joint venture, and independent production opportunities, leveraging Canadian talent and critical minerals for emerging markets in North America, Europe, and the Indo-Pacific region. Nano One has received funding from SDTC and the Governments of Canada and British Columbia.

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Cautionary Notes and Forward-looking Statements

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SOURCE: Nano One Materials Corp.