Nano One Could Reduce GHGs by up to 60% for NMC, 50% for LFP and Reduce Water Use by up to 80%

written by Raj Shah | December 6, 2023

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Highlights:

- Nano One's One-Pot Process demonstrates GHG advantages for both LFP and NMC when benchmarked against the complexity and energy intensity of conventional CAM processes operating in various jurisdictions.
- Third party life cycle assessment (LCA) shows Nano One could reduce greenhouse gases (GHG) by up to 60% for lithium nickel manganese cobalt oxide (NMC811) CAM, and up to 50% for lithium iron phosphate (LFP) CAM.
- One Pot Process estimated to reduce process water consumption by up to 80% in LFP and up to 60% in NMC811.
- Environmental benefits and competitive costs could enable sustainable, secure, and local supply of CAM, aiding the fulfillment of the United Nations Climate Change COP21 commitments of 2016.

Nano One® Materials Corp. ("Nano One" or the "Company") is a clean technology company with a patented process for the production of lithium-ion battery cathode active materials (CAM). The Company is pleased to report that an independent life cycle assessment (LCA) of its proprietary One-Pot Process shows

that greenhouse gas (GHG) emissions could be reduced by up to 60% for the production of nickel-rich NMC811 CAM and up to 50% for LFP CAM.

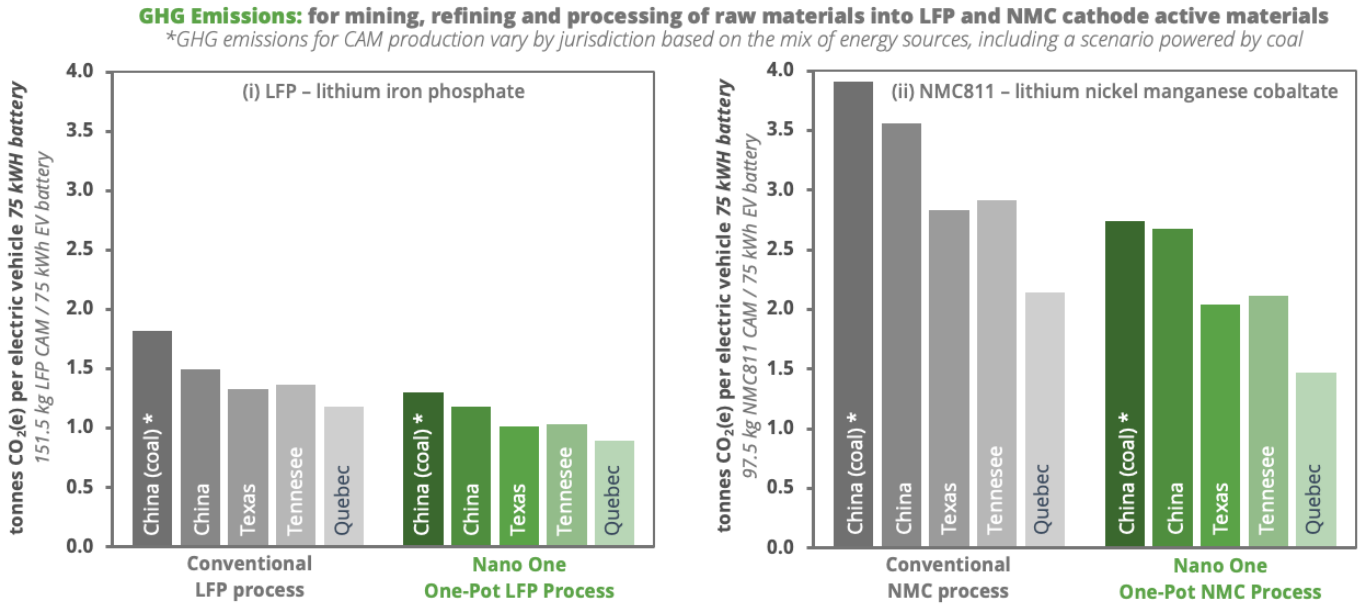
“The third-party LCA report shows that Nano One’s innovative One-Pot Process could cut GHG emissions significantly,” stated Nano One’s CEO, Mr. Dan Blondal, *“and does so by reducing complexity and energy intensity, while also decreasing physical footprint and costs. By using sulfate-free input materials, Nano One also mitigates unsustainable wastewater and sodium-sulfate by-products. Engineering studies have also shown that the One-Pot Process uses up to 60% less water than incumbent processes. Collectively, these benefits help solidify the environmental advantages of Nano One’s technology, and position the Company with a leading, cost-effective solution to support a cleaner global transition to net-zero.”*

Nano One commissioned Minviro Ltd. (“Minviro”), a leading independent LCA consultancy and technology firm, to complete a detailed LCA focused on GHG emissions emitted from cradle-to-end-product, including mining, concentrating, refining, and processing of raw materials into shipment-ready CAM. The report compares the production of NMC811 and LFP in various jurisdictions, made using incumbent processes to Nano One’s proprietary One-Pot Process. The potential for reduced emissions is valuable information as Nano One considers options for licensing, scale-up and expansion to align with market demands.

Minviro’s Dr. Robert Pell stated, “Life cycle assessment is more than a compliance requirement; it’s an essential instrument for quantifying and helping reduce the environmental footprint of processes, products and technology. The LCA results for Nano One’s One-Pot Process highlight the opportunity for innovations in cathode production to drive sustainability across the entire battery industry.”

LCA Report Results and Interpretation

The report shows that Nano One's One-Pot Process could reduce GHG emissions by 30-60% for NMC811 and 25-50% for LFP, depending on jurisdiction and their energy sources. The reduced GHG emissions for both NMC811 and LFP are made possible by cleaner supply chains, lithium carbonate and sulfate-free metal feedstock, fewer process steps, and more efficient use of kilns, and by eliminating wastewater, sodium-sulfate by-products and their respective treatments.



The LCA report also shows that the One-Pot Process could generate (i) 50% fewer GHGs than conventional coal-powered LFP and (ii) 60% fewer GHGs than conventional coal-powered NMC811.

A 35 GWh cathode production facility would produce enough CAM for electric vehicle batteries to replace 470,000 gas-powered vehicles per year, and by using Nano One's cleaner One-Pot Process, a plant of this size could save additionally on GHG emissions, up to the equivalent of another 95,000 gas-powered vehicles per year for LFP and another 250,000 gas-powered vehicles per year for NMC811.

Third Party Engineering Study on Water Usage

The LCA builds on previous studies showing the economic and environmental benefits of Nano One's One-Pot Process. An internal study indicated the potential reduction of process water use by up to 80% for LFP while a third-party engineering study showed a potential for 60% savings for NMC811, representing a savings of approximately 4,300 litres of water per 75kWh electric vehicle. This amounts to 2 billion litres of water saved annually per 35 GWh cathode production facility, which is the equivalent of 800 Olympic size swimming pools per year.

Reducing process emissions and water use will help companies and the 196 parties that signed the Paris Agreement at the UN Climate Conference (COP21) in meeting their collective goal to limit the temperature increase to 1.5°C above pre-industrial levels.

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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 Sumitomo Metal Mining, 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.

For more information, please visit **www.nanoone.ca**

About Minviro Ltd.

Minviro (www.minviro.com) is a globally recognized consultancy and technology company specialised in carrying out life cycle assessments along the battery and battery raw material industry. The company provides quantitative environmental and climate impact data for mineral resource projects, battery manufacturers and OEMs to make environmentally informed decisions and compliance with upcoming regulations. Minviro has recently completed, or are engaged for LCA assessments, for various processes and products being developed in the battery raw materials markets.

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Cautionary Notes and Forward-looking Statements

Certain information contained herein may constitute "forward-looking information" and "forward-looking statements" within the meaning of applicable securities legislation. All statements, other than statements of historical fact, are forward-looking statements. Forward-looking information in this news release includes but is not limited to: industry demand; the environmental and cost benefits of the One Pot Process obtained from the LCA and results from engineering and internal studies; the estimation of water, costs and CO_2 reduction comparing the One-Pot Process against conventional methods; incurrence of

costs; competitive conditions; general economic conditions; the intention to grow the business, operations and potential activities of the Company; the functions and intended benefits of Nano One's technology and products; the development of the Company's technology and products; the commencement of a commercialization phase; prospective partnerships and the anticipated benefits of the Company's partnerships; the Company's licensing, supply chain, joint venture opportunities and potential royalty arrangements; the purpose for expanding its facilities; and scalability of developed technology; and the execution of the Company's plans – which are contingent on support and grants. Generally, forward-looking information can be identified by the use of terminology such as 'believe', 'expect', 'anticipate', 'plan', 'intend', 'continue', 'estimate', 'may', 'will', 'should', 'ongoing', 'target', 'goal', 'potential' or variations of such words and phrases or statements that certain actions, events or results "will" occur. Forward-looking statements are based on the current opinions and estimates of management as of the date such statements are made are not, and cannot be, a guarantee of future results or events. Forward-looking statements are subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of activity, performance or achievements of the Company to be materially different from those expressed or implied by such forward-looking statements or forward-looking information, including but not limited to: the environmental and cost benefits of the One-Pot Process obtained from the LCA and results from engineering and internal studies; general and global economic and regulatory changes; next steps and timely execution of the Company's business plans; the development of technology, supply chains, and plans for construction and operation of cathode production facilities; successful current or future collaborations that may happen with OEM's, miners or others; the execution of the Company's plans which are

contingent on support and grants; the Company's ability to achieve its stated goals; the commercialization of the Company's technology and patents via license, joint venture and independent production; anticipated global demand and projected growth for LFP batteries; and other risk factors as identified in Nano One's MD&A and its Annual Information Form dated March 29, 2023, both for the year ended December 31, 2022, and in recent securities filings for the Company which are available at www.sedarplus.ca. Although management of the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements or forward-looking information, there may be other factors that cause results not to be as anticipated, estimated or intended. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements and forward-looking information. The Company does not undertake any obligation to update any forward-looking statements or forward-looking information that is incorporated by reference herein, except as required by applicable securities laws. Investors should not place undue reliance on forward-looking statements.

SOURCE: Nano One Materials Corp.