

The million mile battery is ahead for electric vehicles – and investors

Nano One positioned for great things as the EV boom approaches

Superior battery technology continues to move towards significant breakthroughs such as the 'million mile battery' and 'low cost/fast charging' lithium ion batteries. These new advances will act as a huge boost for electric vehicle (EV) sales and allow the next generation of EVs to become super competitive with conventional cars. The **million mile battery** suddenly makes EVs the preferred choice for fleet operators (taxis, hire cars, deliveries, trucking etc) and the cheaper/fast charging batteries mean that by 2022 we should start to see EVs reach price parity with conventional cars. This will lead to a tsunami of EV sales.

All of this is only possible because of scientific breakthroughs by leading companies such as Nano One Materials Corp. (TSXV: NNO). Car and battery manufacturers are jumping onboard so that they can remain competitive in a rapidly changing auto world. Volkswagen's partnership with Nano One is just one of many examples.

Understanding the massive changes happening in the auto industry helps explain why Nano One's stock is up 145% over the past year as investors start to see their potential of the predicted US\$23 billion cathode market opportunity. Specifically, Nano One is targeting the licensing opportunity to improve cathodes estimated at \$1 billion in annual revenues by 2025.

Nano One's mission is to establish its patented technology as a leading platform for the global production of **a new generation of battery materials**. Nano One has developed patented technology for the low-cost production of high-performance lithium ion battery cathode materials.

Nano One is targeting a potential \$1b licensing opportunity in the \$23b cathode market by 2025

 Source

Investors might think that it is too late to buy into Nano One looking at recent stock price gains, but actually on the current market cap of C\$239m if Nano One can deliver the potential revenues below as per their targets the stock will have appeared cheap. This is because they are targeting about \$70m a year in revenues by 2025 and profit margins are expected to be extremely high.

Nano One potential revenues by 2025



Source

Nano One's patented cathode used for the 'million mile battery'

Nano One announced in June this year the development of a coated, single crystal cathode material for lithium ion batteries that is providing **up to 4 times improvement in longevity**. The technology is applicable to all of Nano One's cathode materials but is especially relevant to lithium nickel manganese cobalt oxide (NMC811). According to Nano One, "Increased durability is critical in enabling extended range, faster charging and even million mile batteries for electric vehicles."

This breakthrough makes the 'million mile battery' within

reach. Such a battery would mean EVs can last at least 4x longer than a conventional car. The implications are enormous. Fleet operators will be lining up to buy EVs with million mile batteries.

Nano One's other key projects (LFP cathodes, and solid state battery cathodes)

Nano One has also made great progress in reducing the cost and improving the performance of Lithium Iron Phosphate (LFP) cathodes. Nano One has developed patented 'one-pot cathode materials and production processes' that reduces both the time and cost of LFP production. Working with partners such as Pulead who specialize in LFP cathode production opens up the door for licensing opportunities.

Nano One is also working on a breakthrough for the 'holy grail' of batteries – a solid state battery. Nano One's patented cathode tests positively in solid state batteries with auto companies. Nano One says that their "cobalt free cathode reduces supply chain risk, increases power and enables fast charging," and their "coated nanocrystal cathodes (single crystal) boost durability, capacity and charge rates."

Nano One is partnered for success

Nano One is very well partnered into the EV/battery supply chain via partnerships with industry giants Volkswagen, Pulead, Saint-Gobain and other undisclosed global automotive interests. Added to this they have had the support of the Canadian government.

Closing remarks

With so many breakthroughs in one year it is little wonder that Nano One's stock price is up 145%. Great management, great technology, and great partners are always a winning formula.

Nano One currently has a market cap of C\$234m and looks poised for great things as the real EV boom is just about to begin.

Further learning

- Dan Blondal on Nano One's breakthrough in lithium-ion cathode materials and the 'million mile battery' (video)
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Dan Blondal on Nano One's breakthrough in lithium-ion cathode materials and the 'million mile battery'

"The idea of a single crystal cathode has been around for a while but the conventional methods for making them are very expensive. You want to spend as little time in the furnace as possible and we have developed a way to do that. Our crystals form very readily in the furnace and they self coat in the furnace so you don't have to have a secondary coating process. We have simplified the process. It is less complex and because the crystals form quickly we get an inexpensive way of making them that doesn't have the downside of spending too long in the furnace." States Dan Blondal, CEO, Director & Founder of Nano One Materials Corp. (TSXV: NNO), in an interview with InvestorIntel's Tracy Weslosky.

Dan went on to say that even with single crystal there is degradation but if you coat that single crystal the cathode material lasts four times longer. Dan further added, "by making the material more durable you can get many more charges out of it. The electric battery that goes into a car is

somewhat restricted by the durability of the materials. If the material is not very durable then you have to make the battery a bit bigger. A more durable battery allows you to either drive a million miles which is important for taxi drivers, buses and utilities, or charge is much faster because as the battery is more durable it can take more aggressive charge or drive a little bit further everyday.”

To access the complete interview, [click here](#)

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A breakthrough in longer lasting lithium-ion cathode materials brings ‘the million mile battery’ dream closer to reality

The biggest new trend in the electric vehicle (EV) and battery industry right now is ‘the million mile battery’. The significance for the industry is huge. Imagine owning an electric car that can last for one million miles, or 1.6 million kilometers. This is a lifespan several fold longer than what current cars can offer. Owners will no longer need to worry about replacing their EV battery after 8-10 years.

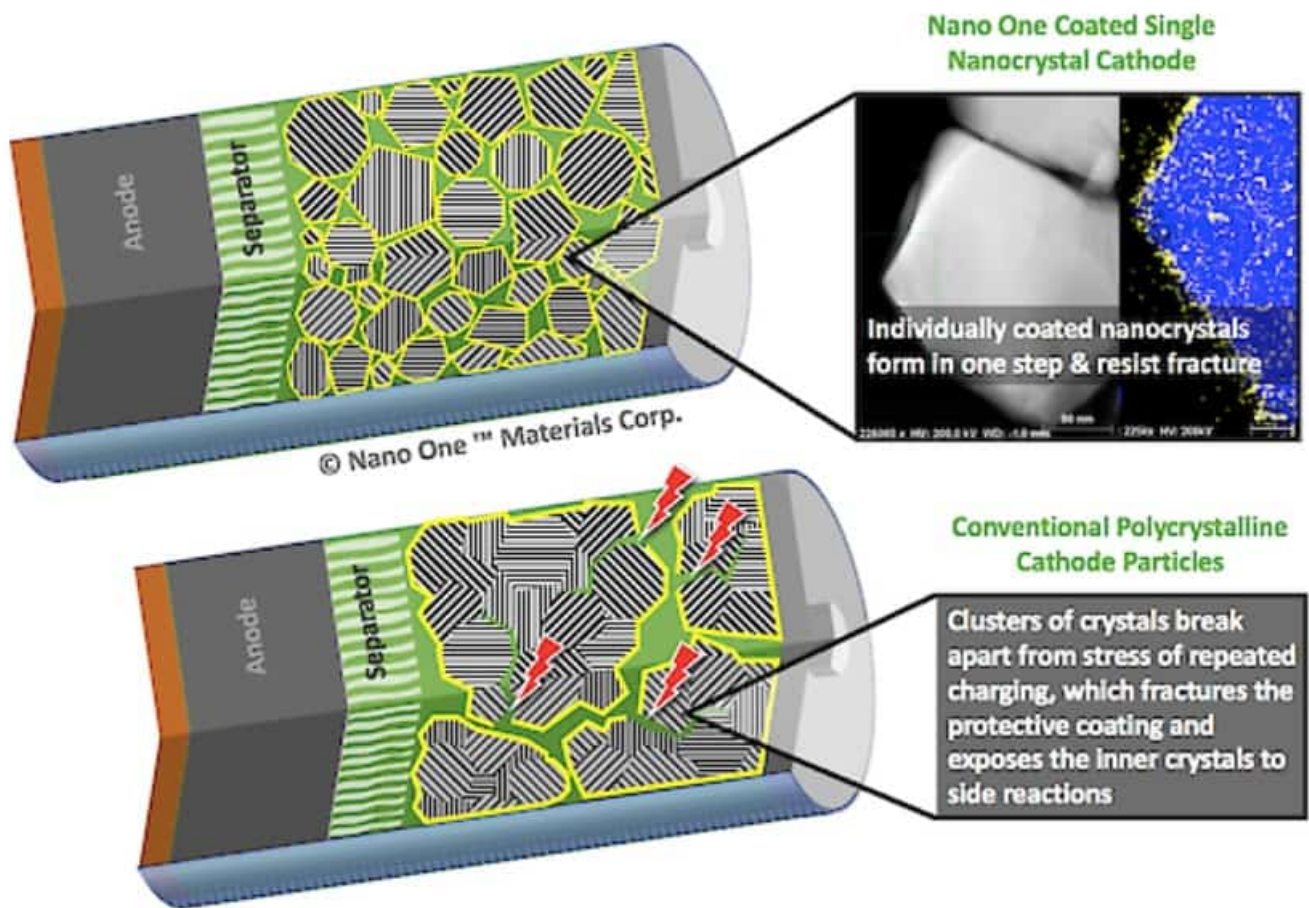
Even bigger is that fleet owners can own just one EV and run it for over 1 million miles. The taxi and trucking industry will be lining up for million mile EVs as it would be economic

suicide not to own one. The EV industry is set to celebrate the breakthrough of longer lasting more durable cathodes that lead to better batteries capable of fast charging and a million miles lifetime

Nano One Materials Corp. (TSXV: NNO) (NNOMF) has just announced a breakthrough in 'longer lasting' lithium-ion cathode materials. The Company has developed a coated single nanocrystal cathode material which provides protection against undesirable side reactions and the stresses of repeated charge and discharge cycling.

Nano One's patented One-Pot process combines all input components – lithium, metals, additives and coatings – in a single reaction to produce a precursor that, when dried and fired, forms quickly into a single crystal cathode material simultaneously with its protective coating.

Nano One's patented method to produce a single crystal cathode material with a protective coating



Source

Dr. Stephen Campbell, Chief Technology Officer of Nano One Materials Corp. stated:

“We are focused on optimizing this for NMC811 and I am pleased to present recent results that show how protective coatings on a robust crystal structure can make cathode powders more durable and longer lasting. **Increased durability is critical in enabling extended range, faster charging and even million mile batteries for electric vehicles.....**By forming protective coatings on individual nanocrystals, Nano One eliminates process steps and is engineering new materials with enhanced durability for various applications including electric vehicles. These are positive results and we are optimizing the materials for third party evaluation on the path to commercializing this technology.”

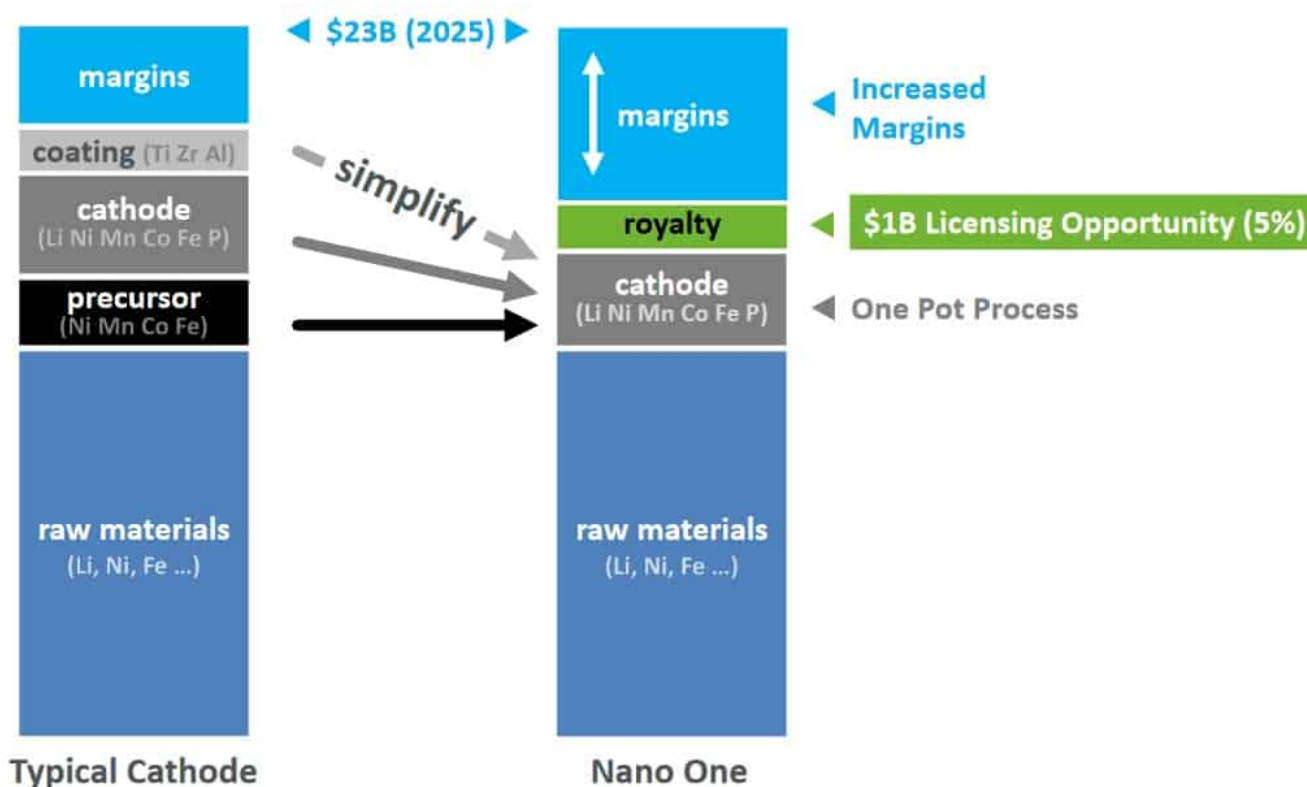
The issues of range, charging times, and battery longevity are

all critical to electric vehicles. This highly significant breakthrough, along with others, will lead to longer range, fast charging with less damage, and million mile batteries for EVs. The technology is really game changing in so many ways and should help pave the way for wider spread adoption of EVs in future years, especially for fleet operators such as taxis, buses, trucks, and other EVs that require heavy use.

Nano One is already very well partnered into the EV/battery supply chain via partnerships with industry giants such as Volkswagen, Pulead, Saint-Gobain and other undisclosed global automotive interests. Added to this recent raisings and government support means Nano One has about \$16 million of cash to further their patents, research and business plans & co-development activities.

Cathode manufacturers can enjoy increased margins even after paying Nano One a royalty

\$1B Licensing Opportunity



Source

Closing remarks

Nano One is leading the cathode industry with innovative and critical technological breakthroughs to make batteries better. The battery cathode market is forecast to be worth \$23 billion in revenues by 2025, and Nano One's goal is to achieve up to \$1 billion in licensing fees revenue for their patented cathode technologies. Given their progress so far that is looking like a highly achievable goal.

Nano One also works on the development of processing technology for the production of nano-structured materials. The Company is focused on building a portfolio of intellectual property and technology know-how for applications in markets that include energy storage, specialty ceramics, pharmaceutical, semiconductors, aerospace, dental, catalysts, and communications.

On a current market cap of only C\$110 million it is not too late for investors to get onboard. These are truly very exciting times for Nano One, and for the EV/battery industry as a whole. The big winner will also be the consumers of fast charging EVs with batteries that can charge faster and last a million miles or more. I can't wait to buy one myself.

[Publisher's Note: Special thanks for the rights to publish the above artwork from Brendon Grunewald of the Polar Conservation Organisation]