EIGHT CAPITAL

INITIATING COVERAGE

Nano One Materials Corp.

(NNO-V: C$5.35), (LBMB-F: EUR$3.59)

April 6, 2021

BUY

Target: C$8.00

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Nano Technology; Macro Opportunity

NNO-V				
Rating:				BUY
Target Price:				$8.00
Forecast Dividend:				$0.00
Projected Return:				50%
Company Data				
Last Price (04/03/21):				$5.35
52-Week Range:				$0.85-6.50
Shares Outstanding - Basic (mm):				93.6
Shares Outstanding - fd (mm):				99.8
Avg. Daily Volume (3 Mos) (mm):				0.31
Market Capitalization ($mm):				$534
Net Debt (Cash) ($mm):				-$54
Enterprise Value ($mm):				$480
Fiscal Year-End:				31-Dec
Estimates	**2020A**	**2021E**	**2022E**	**2023E**
Revenue ($mm):	$0.0	$0.0	$0.0	$2.7
Adj. EBITDA ($mm):	-$3.5	-$5.6	-$6.2	-$4.9
Adj. EBITDA Margin:	-	-	-	-
Valuation	**2020A**	**2021E**	**2022E**	**2023E**
EV/Revenue (Tr.)	n/a	n/a	n/a	188.7x
EV/Revenue (NTM)	n/a	n/a	182.5x	23.3x
EV/EBITDA (Tr.)	-47.3x	-91.2x	-80.4x	-105.9x
EV/EBITDA (NTM)	-29.9x	-82.4x	-102.5x	141.6x

All figures in C$ unless otherwise noted.

Source: FactSet, Eight Capital

NNO: Price/Volume Chart

Source: Factset

Company Description

Nano One is a technology company with a patented and scalable industrial process for the production of low cost, high performance cathode powders used in lithium ion batteries. These unique materials are being designed to add value to electric vehicles and grid storage batteries in the global push for a zero-emission future.

We are initiating coverage of Nano One Materials Corp. (NNO: TSX-V) with a BUY recommendation and an $8.00/share target, which represents 50% upside.

Nano One has developed a patented process (the "One-Pot Process") which we believe has the potential to disrupt the lithium ion (li-ion) battery cathode supply chain. The company is pre-revenue, but the potential of the One-Pot Process has caught the attention of numerous companies, and Nano One has partnerships across the li-ion battery supply chain. We estimate that the company will achieve first revenues in 2023, and that revenues will grow steadily from that point as the technology becomes more widely adopted. Key components of our recommendation include:

- **Technology improves cathode performance and durability**. Nano One's patented One-Pot Process produces a monocrystalline product which has been tested to improve both durability and performance. The technology already has applications across several key types of cathode, including LFP (Lithium Iron Phosphate), NMC (Nickel Manganese Cobalt) and HVS/LNMO (High Voltage Spinel/Lithium Nickel Manganese Oxide). HVS is cobalt free and has potential applications to solid-state batteries as well.
- **Provides cost advantages across the supply chain**. Nano One's One-Pot Process and M2CAM (Metals to Cathode Active Material) process simplify cathode manufacturing and can provide significant cost savings. For example, the conversion of metals / metal sulfates can cost up to $4,000/t, and lithium carbonate / hydroxide can cost up to $1,000-2,000/t. We estimate NNO can save cathode manufacturers over 15% in certain instances, which would allow the company to reasonably capture a ~4% royalty or potentially higher. This royalty stream drives a significant portion of our NAV.
- **ESG benefits across the battery supply chain.** While ESG concerns are providing tailwinds to the broader industry, Nano One's One-Pot Process offers significant environmental benefits to the battery supply chain. This includes: removing the need for metal sulfates, eliminating a large sulfate waste stream, reducing the energy-intensity of the thermal process and cutting transportation bulk. It can also reduce the dependency on cobalt, which can be costly and has garnered concerns for forced labour.
- **A strong macro backdrop**. Unsurprisingly, we believe that the global trend towards electrification will provide tailwinds to the entire lithium battery supply chain. Pronounced trends by investors, governments and automotive manufacturers all suggest robust growth in electrified mobility, which remains the largest source of demand growth for li-ion batteries.
- **Exciting entry point for a catalyst-rich story**. Nano One's technology continues to gain attention and traction with partners, as indicated by the steady stream of new agreements over the past two years. A new partnership or the progression of an existing one, would be supportive of the stock, and we believe that we will see several such announcements this year.

Our target price is based on 1.0x our $7.87/share NAV, for which we provide multiple sensitivities (Figure 12). We also provide bear- and bull-cases for market size and technology adoption that imply NAVs of $1.94 and $19.29, respectively.

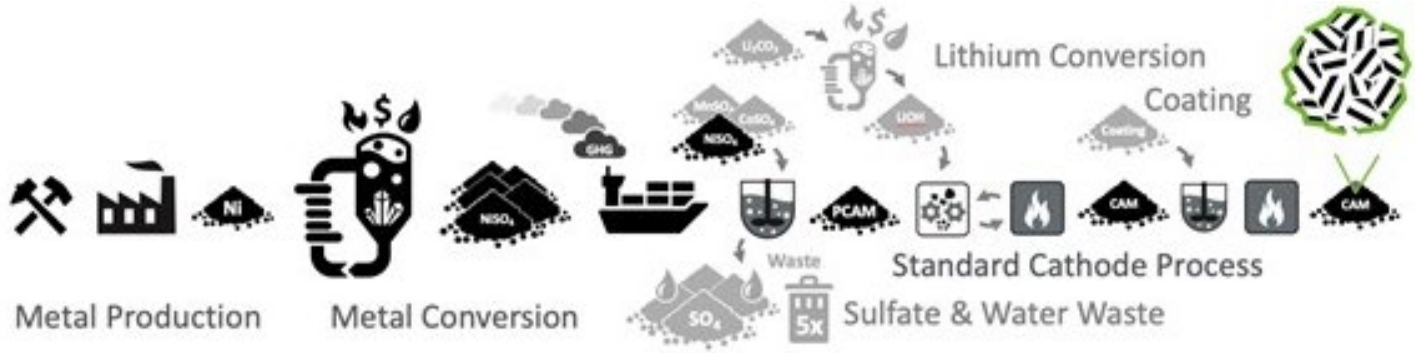
The Basics of Cathode Active Material Production

Introductions to the mechanics of batteries and of the function of cathodes are readily available online, and so are beyond the scope of this report. The supply chain associated with the production of cathode active materials, however, is less well-known and is a material part of Nano One's value proposition, so we will spend some time summarizing it.

The current cathode supply chain is long and complex.

First, metals are processed with sulfuric acid in a water-intensive crystallization process to create metal sulfate powders. These powders are five times heavier, and add to shipping costs and logistics. This product is then combined in an intermediate process to create a precursor active material (PCAM), which generates a sizeable sulfate waste stream. The precursors are ground and milled with lithium hydroxide before being fired in a kiln to allow the lithium to diffuse into the precursor. This thermal process sometimes must be repeated (with subsequent grinding and milling) multiple times before a polycrystalline powder is produced. The powder is then coated with protective materials and fired again. The process is relatively long and costly, and can be influenced by many things, such as the cathode chemistry, the manufacturing region and type/source of metals. Figure 1 highlights some of the steps involved.

Figure 1: The Cathode Supply Chain is Long and Complex



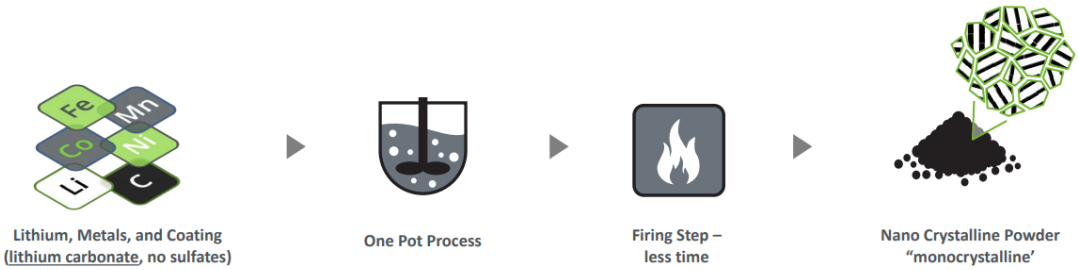
Source: Company reports

The One-Pot Process is not only less costly, but more efficient, and more environmentally friendly than the current process.

In terms of how it is different from the existing method, the One-Pot Process simply uses metals such as nickel and cobalt, which are combined with lithium carbonate and simply coated in one step (the One-Pot Process). The mixture is then fired for a shorter amount of time before arriving at the unique monocrystalline powder product (more on that later). Not only is the cathode powder production process much simpler, but the benefits are experienced upstream as well.

- Metals can be used directly (effectively Nano One's M2CAM, or Metals to Cathode Active Material Process); no longer need to go through a costly and energy-intensive crystallization process that can cost up to $4,000 per tonne.
- The process foregoes using lithium hydroxide, which can be costly (~$1,000-2,000 per tonne) and energy intensive process to convert from lithium carbonate. Using lithium carbonate directly benefits South American producers who would need to convert their lithium carbonate product. Lithium carbonates also do not have the same corrosion and shelf-life concerns that lithium hydroxide does, making handling easier and less costly.

Figure 2: Nano One's One-Pot Process



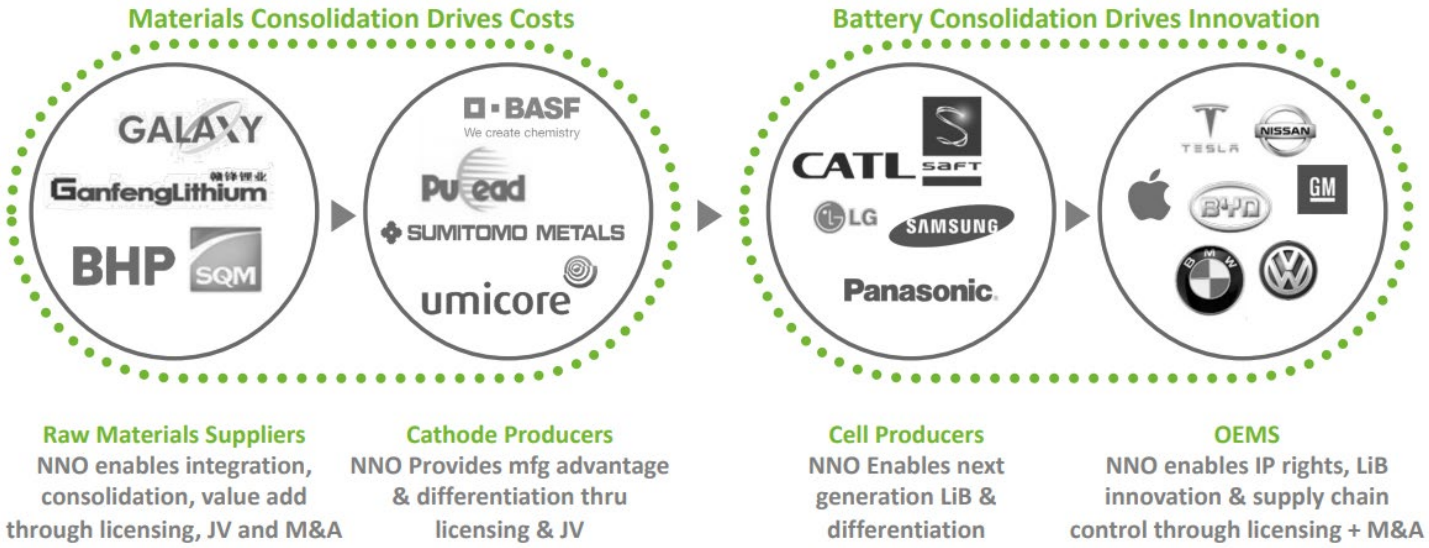
Source: Company reports

As far as how this cathode active material process fits within the broader battery supply chain, NNO provides a brief summary which we present in Figure 3. Raw material suppliers provide the metals to PCAM producers then onto cathode producers, which is where the Cathode Active Materials generation outlined in Figures 1 & 2 occur. These materials are then passed on to cell producers, who produce the individual cells. These cells then go to battery system manufacturers who apply the control layers and other architecture.

Nano One's technology can be attractive to participants across the supply chain, from miners to OEMs.

Interestingly enough, we believe that while NNO's technology is directly applicable to the cathode production stage, there are important collaborations which could be made at both ends of the supply chain. From the mining side, producers of lithium carbonate would like to see NNO's technology become more widely adopted because it increases the demand for their product and reduces the need for any conversion to lithium hydroxide. At the other end of the supply chain, OEMs are incentivized to reduce costs and improve performance at any stage. Cell producers tend to be price and spec takers, and will be less incentivized to initiate these efficiencies. Interestingly, we're seeing indications of the One-Pot Process being a credible threat from both ends of the supply chain. NNO is demonstrating their technology with market participants at both the origination (with Chile) and end-user (VW [Not Rated] and an undisclosed global OEM) stages. We would expect that the company has numerous other collaborations that have not yet been finalized or are subject to confidentiality preventing announcement that will nonetheless give players across the supply chain further confidence in the technology. Following the recent financing, we estimate NNO to have >$50 million in cash (see Figure 19), which will be instrumental in supporting the advancement of initiatives to the commercial phase.

Figure 3: Nano One's Technology Applications across the Supply Chain



Source: Company reports

The Monocrystalline Advantage

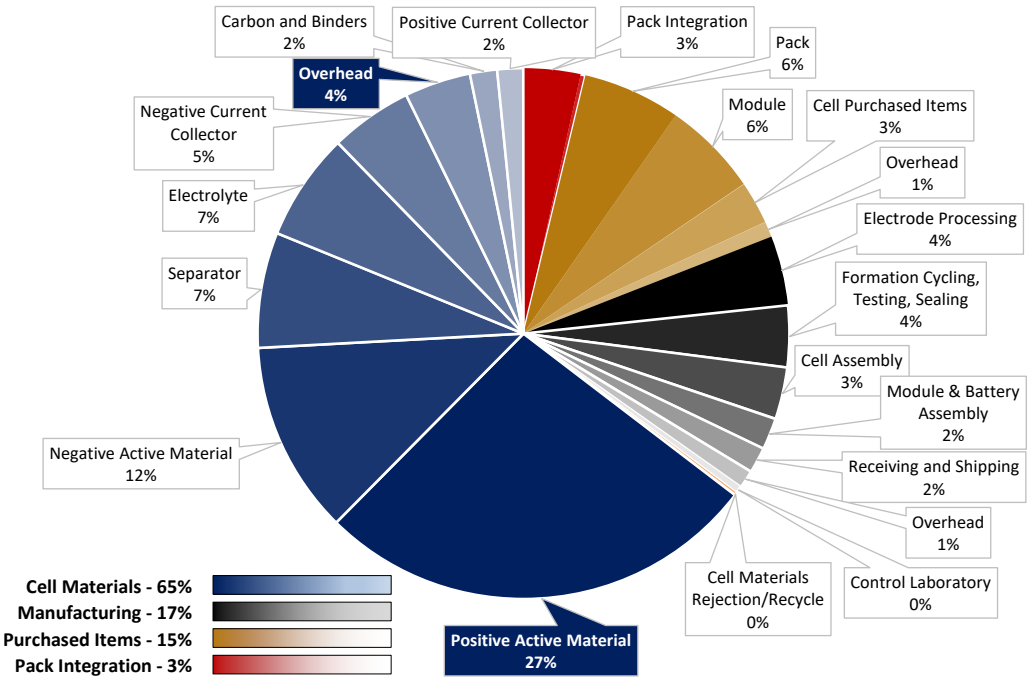
Cost Savings Material, but Difficult to Estimate

Cathode active materials represent by far the largest component of total battery costs.

As we detail in Figure 4, the costs associated with the lithium battery supply chain are extensive, and different chemistries, pricing arrangements, levels of integration, facilities, etc. can make generalizations difficult. However, what can be generally ascertained is that producers should be motivated to reduce the costs of the cathode active material. It represents - by far - the largest component of battery costs at ~27%. As we outline above, the One-Pot Process can introduce material savings of up to $4,000/t for removing the need to sulfate certain metals, and up to $1,000-2,000/t for lithium hydroxide conversion and shipping. The One-Pot Process also eliminates the need for the precursor (PCAM) step, which reduces the operating costs and associated margins for those businesses. The One-Pot Process is also simpler with few steps, which provides for savings around conventional process costs for cathode active material. We also believe that performance and durability improvements outlined above will allow cell manufacturers and OEMs to potentially scale back battery size while maintaining performance, which could represent additional cost

savings or scale up with lower costs to increase range. We assume that these cost savings are in the 10-15% range, but acknowledge it could fall outside that range for certain chemistries. We expect that for NMC, for example, it would be higher. This drives some of our assumptions around what a reasonable royalty rate could be for Nano One that reasonably shares the benefit between NNO and the counter-party. Our NAV uses a base case of 4%, while our bear- and bull-case scenarios use 3% and 5%, respectively (Figure 13).

Figure 4: Nano One Impacts the Largest Cost Component of Li-ion Batteries



*Cost estimates for a NMC811 Cathode Active Material. Total pack price to OEM: $13,486

Source: Argonne National Laboratory, Eight Capital

Performance Enhancements across a Range of Cathode Chemistries

The One-Pot Process can be an effective technology across a range of battery cathode types.

Beyond the cost and process advantages which the technology offers, Nano One is seeing significant performance benefits across a range of cathode types, as we outline below.

Specifically, the single crystal chemistry of NNO's product prevents the degradation of crystals over time. Polycrystalline cathodes (the incumbent) are clusters of multiple crystals which can become stressed after repeated cycles. This causes the protective coatings of the active material to fracture, which exposes the inner crystals to side reactions. Single nanocrystal cathodes resist fracture, which boosts durability and performance. Tests (Figures 5 & 6) are signaling material improvements, which appear to be attracting attention from partners, as indicated by the growing list of partnerships which Nano One is currently engaged with.

The company continues to test and patent applications across different cathodes, highlighting its ongoing innovation and product diversification efforts.

The chemistry of batteries is expected to continue to evolve, and the specific characteristics of certain cathodes make them better suited for certain applications. We believe the One-Pot Process can be effective across a number of different cathode chemistries, and the company has actively sought out additional patents and technical validations across different types. This is encouraging because it speaks to the continuous innovation of the leadership and the technical team. It also further diversifies the potential application of the technology, making them nearly chemistry-agnostic.

Coated Single Crystal NMC (Nickel Manganese Cobalt Oxide)

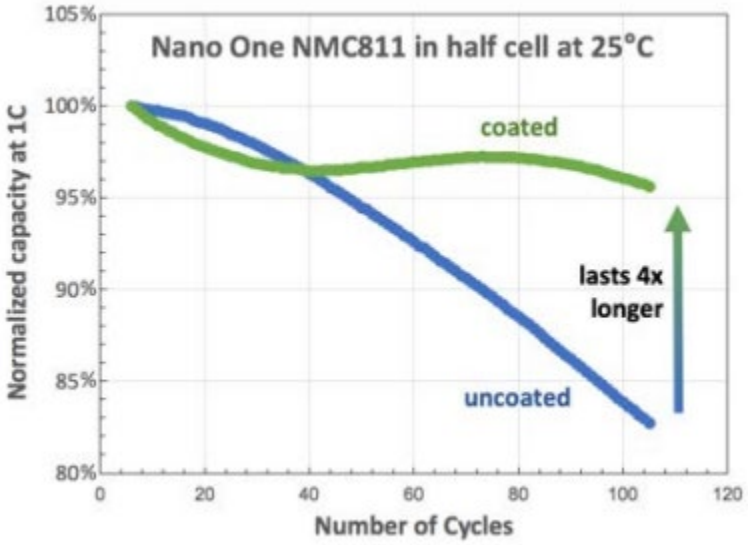
NMC is the most common type of cathode active material, and is generally expected to continue to be so. Avicenne forecasts its market share to grow from 41% in 2018 to over 80% in 2030, while Nano One internally expects NMC to maintain a 40-50% market share.

Either way, it would be the most attractive chemistry to gain commercial access to given its size and leverage to the electric vehicle market. The high nickel content (elevated in NMC811 versus other combinations like NCM532 or NMC622) provides a high specific energy, while manganese has beneficial stabilizing qualities. This allows NMC to offer a combination of both high capacity (specific energy) and cycle life.

Figure 5 summarizes a test of Nano One's cathode materials, which shows materially less capacity fade for coated NMC811.

NNO | Jun. 24, 2020 | Introduces Breakthrough in Longer Lasting Li-ion Cathode Materials

Figure 5: NNO's Single Crystal Cathode Shows Increased Durability in Testing



Source: Company reports

Lithium Iron Phosphate (LFP)

LFP chemistries are very popular, and can be advantageous in a number of circumstances. The key benefits of LFP batteries are safety, price, long cycle life and high current ratings. Although they typically have lower energy densities and are heavier, which may preclude them from becoming more dominant than NMC in the long run, LFP is nonetheless a mainstream battery which has been very popular in China, and will likely continue to be used more for industrial use and electric buses. Wood Mackenzie forecasts they will account for 30% of all batteries in 2030, from 10% in 2015.

Nano One has been in discussions with Pulead over its LFP cathode materials since early 2019, and has engineering designs for a 4,800 tpa LFP plant. This is a very important relationship to monitor, in our view. We present what a royalty on a 4,800 tpa plant may be worth to NNO, along with sensitivities to key inputs, in Figure 9.

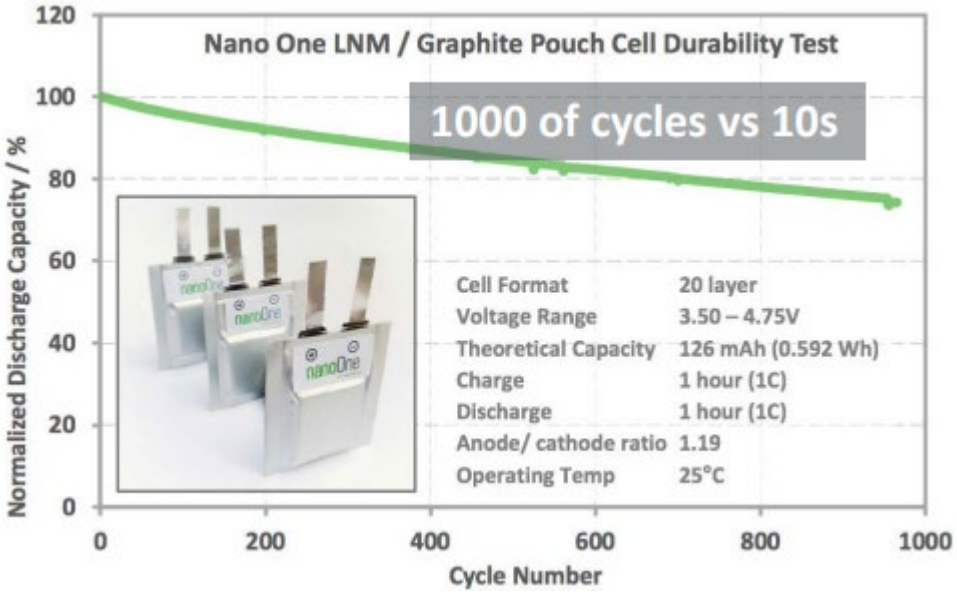
High Voltage Spinel (HVS, LNMO)

If the One-Pot Process turns out to be a key factor in solid-state battery commerciality, its adoption rates would likely exceed our assumptions significantly.

The LNMO chemistry advantageously excludes Cobalt, thereby eliminating associated costs and ESG concerns related to its sourcing. The HVS name is a reference to the High Voltage three-dimensional Spinel crystal structure, which differs from the layered crystal structure of NMC, and enables high rates of charge and discharge with a tenth of the volumetric expansion. These characteristics make HVS a strong candidate for solid-state batteries, where the integrity of solid-solid interfaces (between solid electrodes and solid electrolyte) rely on volumetric stability. Solid-state batteries have tremendous appeal in energy density and fast-charging capabilities, and are often (arguably) thought of as a very large growing segment of the space mid-decade. HVS could be a material growth wedge for Nano One if testing continues to validate its benefits in solid-state batteries. Nano One's HVS also has applications in conventional lithium-ion batteries, with encouraging testing done by Nano One (Figure 6) demonstrating battery cycling with none of the detrimental side reactions that are typical of this class of material operating at elevated voltages and temperatures. **If**

the One-Pot Process turns out to be a key factor in the commerciality of high voltage lithium-ion batteries and solid-state technologies, its adoption rate would likely significantly exceed our current assumptions.

Figure 6: NNO's LNMO Cathode Demonstrates Breakthrough in Cobalt-free Longevity



Source: Company reports

Market Growth & ESG Dynamics

Nano One forecasts growth in Cathode materials from 500 ktpa in 2020 to a range of 1,800-3,100 ktpa by 2029. Our NAV expectations are firmly in this range.

A key reason we are excited by the timing for Nano One's technology is the pronounced growth expected of global electrification. Electric vehicles drive a significant portion of the growth in battery demand (85% of global li-ion battery sales by 2030, according to Avicenne), so electrification announcements by major automotive companies are important to monitor (see here, from Volkswagen, or here, from Lexus). The cathode market was recently estimated to be ~345 ktpa in 2018 by Avicenne (see here), and growing to 500 ktpa by 2020. Nano One forecasts, based on third party reports and internal estimates, further growth to a range of 1,800 ktpa (base case) to 3,100 ktpa (growth case) by 2029. We believe that the anticipated adoption of electric vehicles would indicate cathode material demand somewhere in Nano One's expected range, and have set our NAV assumptions accordingly (see Figure 11). However, we acknowledge this could be impacted by many factors, which leads us to present bear- and bull-case scenarios (Figure 13).

Another key factor to monitor with respect to market growth and dynamics is the increasing focus on building out the domestic battery supply chain. In a future that is predominantly fueled by li-ion batteries, having a fully developed domestic battery supply chain will be of high strategic value, akin to energy certainty and oil supply of the past. There is significant lead-time in developing these facilities, and market participants are beginning to understand this. In Europe, for example, they have established the European Battery Alliance, which seeks to establish a complete domestic battery value chain. The European Investment Bank will support battery-related projects, and expects to fund over US$1.1 billion in 2020 alone. The European commission recently approved US$3.5 billion to create a "pan-European" battery ecosystem via a coordinated research push alongside industry operators.

Europe and the U.S. are increasingly focused on building out domestic battery supply chains.

In the U.S., perhaps incited by recent shortages of semiconductor chips, on February 24th President Biden signed an Executive Order which identifies the importance of mitigating risks in the supply chain for large capacity batteries. While this will be a complicated, drawn out process, we believe that current expectations for China to retain 65-75% of the battery supply chain out to 2030 may be the upper limit of what materializes.

As new regions build out, they have the opportunity to build out smarter, and will naturally deploy the most cost- and environmentally-efficient methods across the supply chain. In our view, this is a positive development for Nano One and its One-Pot Process and M2CAM technology. It remains to be seen what type of subsidies may need to be deployed to facilitate this process, as manufacturing costs domestically have traditionally exceeded those in China.

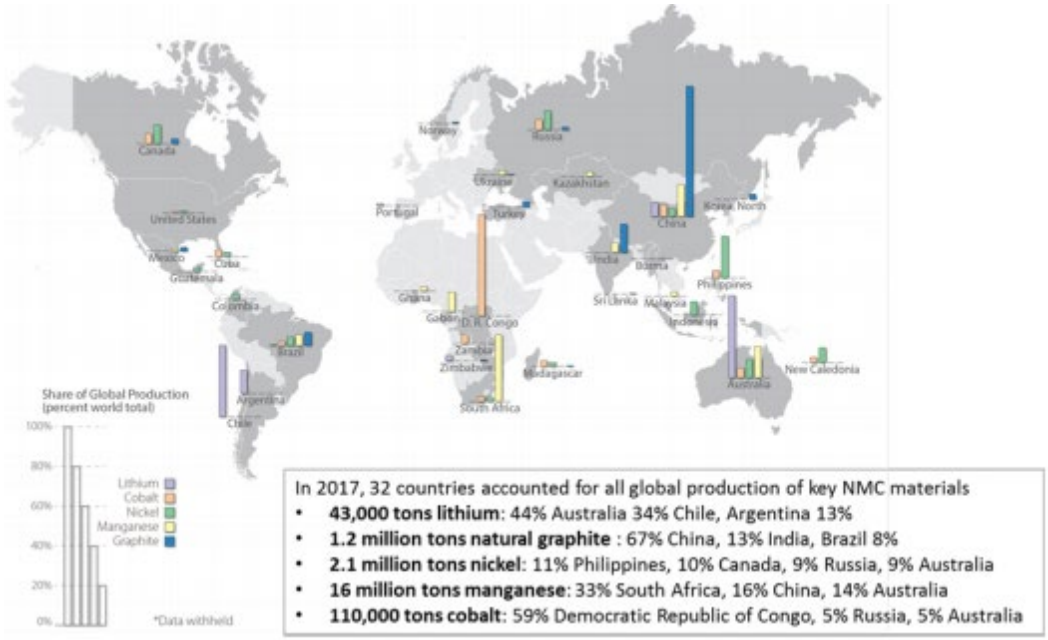
ESG Considerations

This push to build out European and American battery supply chains will increase scrutiny over ESG concerns, which we believe support Nano One. The European Commission recently added lithium to its list of raw materials deemed essential to secure supply of domestically. It also issued a Directive on battery supply sustainability, which includes carbon footprint reporting and minimum recycling levels. European initiatives on environmental concerns, sustainable investing, etc. have tended to be leading indicators for the rest of the world. In the company's recent press release from February 26th (see here), NNO outlined some of the ESG benefits offered by its M2CAM process.

Nano One's M2CAM - Video Summary

- **Metal Sulfates:** By eliminating the need for metal sulfates, NNO removes a costly, energy intensive crystallization process which metals would typically undergo. The resulting metal sulfates are also much heavier and therefore costly to ship (as much as 4-5x the weight of the metal). This benefits miners by expanding the market for their raw metals, and reduces the costs and logistical issues of converting metals to metal sulfates wherever they are incurred.
- **Lithium Hydroxide:** NNO's process also eliminates the need to convert lithium carbonate to lithium hydroxide. As a background, lithium chemicals for batteries are either produced from brine as a carbonate, or from spodumene converted to carbonate or hydroxide. NNO's process would allow for increased demand for carbonates, to the particular benefit of regions which make their lithium from brine, such as in South America (Chile, Argentina and Bolivia). Recall that NNO has a collaboration with the government of Chile (announced January 21st, link here).
- **Sulfate Waste Stream:** The precursor active material process which is traditionally performed generates a sizeable (4-5x) waste stream of water and sulfates, which must then be disposed. The process is resource intensive, and can be entirely avoided with NNO's technology.
- **Cobalt:** The stability provided by NNO's HVS product reduces the need for stabilization properties of cobalt, which reduces the need for the metal. Aside from the high cost of cobalt, another concern involves the potential forced labour or child mining associated with artisanal mining of cobalt in the DRC, which is where the majority of global cobalt reserves can be found. While a preferred long-term solution would be to work with miners and ultimately eliminate these practices, reducing the need for cobalt can be a tool. In general, reducing the need for a metal that has high concentration risk could be advantageous in the long run (Figure 7).

Figure 7: Key Nickel, Manganese and Cobalt Materials Locations



Source: Mayyas et al. 2019

Partnerships

The establishment and progression of partnerships are key catalysts for Nano One. Encouragingly, we see advantages of the One-Pot Process that market participants across the supply chain can benefit from. The range of partners that NNO has announced thus far supports this idea. We believe that upstream pressures by materials suppliers, combined with downstream pressure by OEMs, will ultimately result in technology adoption by cathode manufacturers. Below, we outline the nature of NNO's partnerships.

Figure 8: Nano One Partnership Overview

	Undisclosed US OEM	Undisclosed Asian Cathode Producer	Pulead	SAINT-GOBAIN
VW Research Group	**"American OEM"**	**"Asian Company"**	**Pulead**	**Saint Gobain**
VW's EV Expansion team $66 Billion EV budget 22 Million EVs by 2030	Large Global Auto Producer Ambitious EV strategy	Multi Billion $ Cathode manufacturer Supplier to major Asian Auto OEM	Big China cathode producer Proven licensee of Prayon, BASF & Umicore	400-year-old materials co 150k employees Worldwide Supplier for cathode kilns
Collaboration Details	**Collaboration Details**	**Joint-Development**	**Joint Development**	**Joint-Development**
Enhance durability of high energy battery materials Successful results WIP on cost modeling	Cathode evaluation program for EV Batteries Economic analysis and long-term commercial goals	Combine technologies Next-gen batteries Objective to advance to production	Co-develop LFP production Sound plant design, budget & economics Large LFP target for e-buses, renewable and EV	Enhance high-temp cathode processing Combine technology

Source: Company reports

Saint-Gobain: Saint-Gobain (Not Rated) is a multi-billion euro French multinational that produces a variety of construction and high-performance materials, for a range of applications, including as a supplier for cathode kilns.

NNO | Dec. 18, 2018 | Signs Joint Development Agreement with Saint-Gobain

Pulead: In early 2019, Nano One announced a joint development agreement with Pulead - a major cathode producer - to evaluate NNO's technology and its potential applications to Pulead's LFP cathode materials. Pulead is a major supplier of LFP cathodes, and could represent a large opportunity for NNO. Since the initial announcement, NNO has progressed discussions by establishing a source of sustainable raw material supply, and made a 4,800 tpa engineering report available. Market demand for LFP cathodes is expected to reach 200 ktpa by 2025 (from company reports).

NNO | Dec. 9, 2019 | Joint Development with Pulead Achieves Critical Milestone

NNO | Aug. 13, 2019 | Pulead Joint Development Demonstrates Advantageous Economics

NNO | Apr. 2, 2019 | Update on Joint Development Work with Pulead

NNO | Jan. 21, 2019 | Signs JDA with Chinese Cathode Producer Pulead

Volkswagen: In May 2019, it was announced that Volkswagen joined as an SDTC project contributor, along with previously announced consortium members Pulead and Saint-Gobain. Subsequently, in June 2019 NNO announced the purchase order for C$550k from an unnamed Global OEM (not confirmed to be VW) to jointly evaluate processes and cathode materials for li-ion batteries in automotive applications. Materials made with NNO's processes will be evaluated under automotive testing conditions, with a focus on improving the stability and durability of nickel rich cathode materials for electric vehicle applications. If successful, the companies may explore future opportunities to advance these technologies through to commercialization.

NNO | May 31, 2019 | Nano One Approved for $5 Million Funding from SDTC

NNO | June 20, 2019 | Global Automotive Company Issues Purchase Order

Undisclosed Asian Cathode Producer

Global Cathode Manufacturer: NNO announced a Joint Development Agreement (JDA) with an unnamed multi-billion dollar Asian cathode material producer based outside of China. Little incremental colour was provided, which we view as understandable due to the competitive nature of the business. We believe that this announcement may pose the most exciting near-term partnership for Nano One. A counter-party with sufficient scale that can directly deploy NNO's technology presents a viable path to commercialization. The company specified that potential outcomes could include a joint venture, licensing of NNO's technology or further joint development work.

NNO | Aug. 10, 2020 | Joint Development Agreement with Global Cathode Material Producer

Undisclosed US OEM

Multinational Auto Manufacturer: Late last year, Nano One announced that it had entered into a cathode evaluation and benchmark agreement with a large unnamed multinational auto manufacturer that is based out of America. The companies will jointly evaluate NNO's materials for automotive li-ion batteries. While the announcement is light on details, we believe it has exciting potential. The electric vehicle industry is expected to drive the majority of demand growth for li-ion batteries, and partnering with a sizeable player would provide strong exposure to that. It would incrementally validate NNO's technology for automotive companies, which we believe would in turn increase the likelihood of adoption across other OEMs. Recall, this is the second partnership with a major automotive company (see VW). Despite not producing the cathodes themselves, positive tests could lead the automotive manufacturer to enact changes upstream with its cell and cathode providers, which would then adopt NNO's processes.

NNO | Dec. 18, 2020 | Cathode Evaluation with Major Global Automotive Co.

AUI & the Chilean Clean Technology Institute: On January 21st, the company announced that its joint proposal with Associated Universities, Inc. was successful to the Chilean Clean Technology Institute (ICTL). The proposal includes a demonstration of Nano One's One-Pot Process using lithium carbonate for the production of nickel-rich cathode materials. Chile is a key global supplier of lithium, and accounted for the second most of any country in 2019 (~18,000 tonnes). Importantly, lithium extraction in Chile is achieved via solar evaporation of brine pools, which is exclusively carbonate. To the extent NNO's technology can reduce demand for lithium hydroxide or the need for carbonate to convert to hydroxide, suppliers of carbonate – such as Chile – would benefit from increased demand.

NNO | Jan. 21, 2021 | Selected to Showcase Clean Tech. in Chile

University of Michigan: The recent announcement with UM will likely not be directly financially beneficial; however, it is indicative of the broad potential of NNO's technology. NNO has previously discussed the potential application of its applications to LNMO / HVS chemistries and solid-state batteries, and it is encouraging to see partnerships exploring the subject progress. The coated cathode materials stabilize the cathode/electrolyte interface because there is less cathode expansion and stress, and the coatings protect the cathode from side-reactions. We understand that the company has numerous similar ventures which, while they may not yet warrant disclosure, indicate continued interest in the potential applications of the One-Pot Process.

NNO | Feb. 22, 2021 | Technology Performs well in Solid State Battery Collaboration

NNO | Apr. 23, 2020 | NNO Patented Cathode Tests Positively in Solid State Batteries

Demonstrative Partnership Value

A key step in the path towards commerciality will be establishing specifics around the application and deployment of NNO's technology. To this end, we view Noram's engineering report - which details design specifications and budgetary estimates of a 4,800 tpa LFP manufacturing line - as being important to establishing royalty and/or profit sharing levels.

NNO | Jun. 4, 2020 | Engineering Report Enhances Value of NNO LFP Battery Cathode Tech

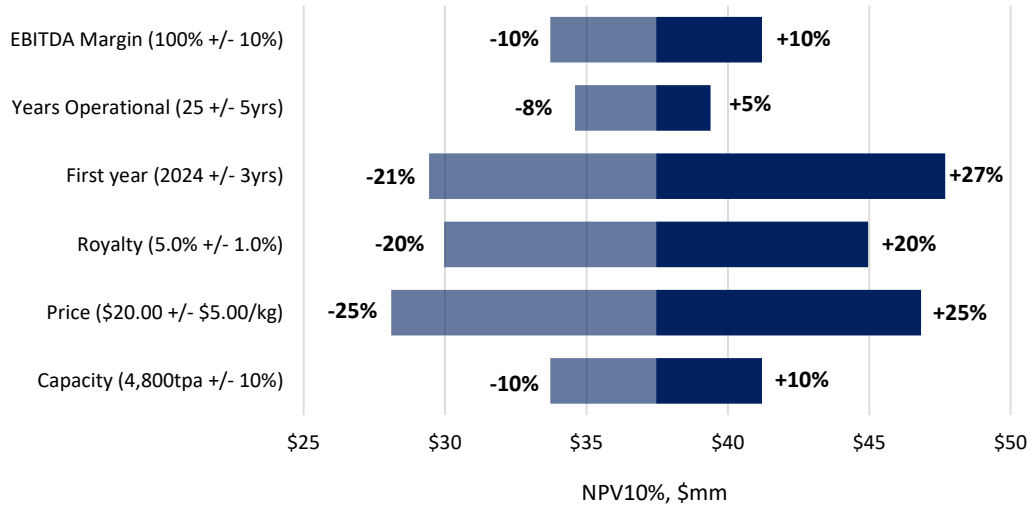
While at this time there is no firm agreement with a cathode manufacturer to build such a facility, we believe the report will expedite discussions with partners (the report has likely helped advance discussions with Pulead). In order to quantify the potential impact of such an agreement, in Figure 9 we summarize what such a plant might offer in terms of value to

NNO. We estimate that a 5% royalty agreement on a 5,000 tpa plant might be worth ~$40mm (NPV10%) to the company, and we provide a sensitivity to key inputs. Additionally, there is the possibility of a partnership on facility construction, with NNO taking a more significant seat at the table.

A commercial agreement would validate NNO's technology further, and increase the likelihood of incremental agreements, in our view.

While the actual monetary value is instructive, we note that the greater impact to share price would likely be due to the validation by a commercial partner, and the increased likelihood of similar future arrangements. Our base NAV forecasts that NNO's technology will be applied to 10% of the market (~250 ktpa) by 2030, meaning that numerous such agreements will need to be reached before then. We also note that while engineering plans are for a 4,800 tpa facility, the cathode manufacturing industry is heavily weighted to major players, so adoption by a major producer could result in a much larger plant.

Figure 9: Sensitivities to Key Inputs of a 5,000 tpa Facility (NPV10%, $mm)



Source: Eight Capital

Net Asset Value & Target Price Methodology

In our view, a multiple-based approach does not fully capture NNO's unrealized growth and value potential.

If Nano One were to move forward with a significant partnership, it would experience a massive step change in revenue and cash flow. However, because of the lead-time associated with building a new facility, we believe that even under this optimistic scenario, the company would be 2-3 years from production. Beyond the ~2023 time frame, we believe that revenues will grow significantly as more partnerships are confirmed, and the industry continues its rapid expansion. In our view, a multiple-based approach - even applied to 2023-25 revenue or cash flow - would not adequately capture the unrealized growth and value that Nano One's technology presents. For example, our target price represents ~16x 2025E Revenue, which contracts to less than 6.0x 2027E Revenue given the growth over that time period.

Figure 10: Our Valuation Methodology

	Metric	Weighting	Value
Revenue Multiple	na	0%	na
EBITDA Multiple	na	0%	na
NAV-based Approach	Base NAV (12%)	100%	$7.87
Blended Target Price			$7.87
Rounded Target Price			**$8.00**

Source: Eight Capital

We believe it is more reasonable to base our target price on a NAV valuation which is predicated on our assumptions for a total addressable cathode market and a rate of adoption for NNO's technology. Based on the current li-ion cathode market of 500 ktpa and a 20% growth rate, we see a ~$32 billion market emerging by the end of the decade, driven

Our NAV approach forecasts a 20% cathode market growth rate and eventual 10% market capture by NNO (1.2%

by demand for EVs, and supported by other applications such as storage. We assume that NNO is able to capture a 10% market share (6% via licensing arrangements, and 4% through JVs), which amounts to ~250 ktpa by 2030. Note that these are gross amounts, and that we assume a 4% royalty on licensing arrangements and that NNO will participate in JVs at a 25% working interest. As a result, Nano One's net working interest in the market would be 1.24%. These assumptions drive our NAV of $7.87/sh.

We also note that we have had to make some generalities for our NAV, and do not break out market share or adoption by cathode type. This would have added a number of other factors, such as cathode-specific prices, growth-rates, capital costs, among others.

Figure 11: Net Asset Value Summary

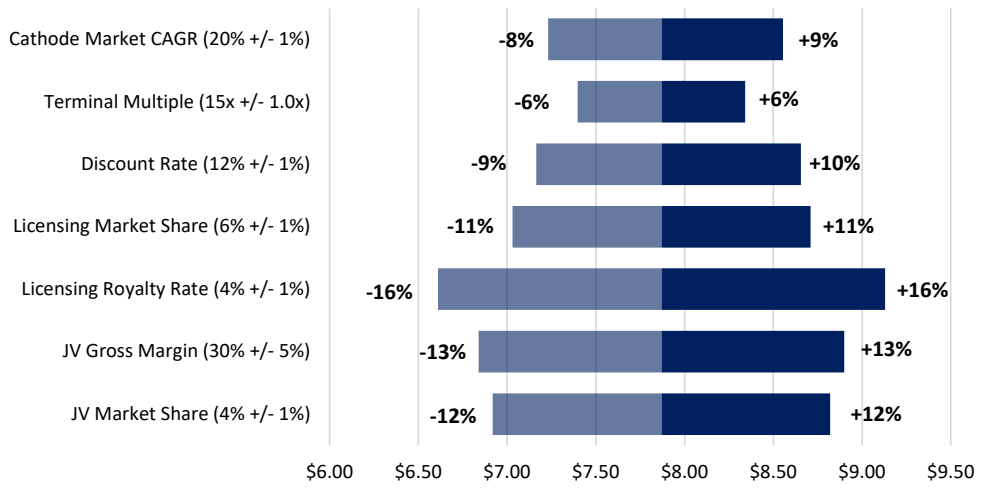
Year		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Terminal
Li-ion Cathode Market	ktpa	500	600	720	864	1,037	1,244	1,493	1,792	2,150	2,580	3,096
Cathode Market Growth	%		20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Market	$bln	$6.3	$7.6	$9.1	$10.9	$13.1	$15.7	$18.9	$22.7	$27.2	$32.6	$39.2
NNO Market Share via Royalty / Licensing												
NNO Market Share	kt	0.0	0.0	5.4	13.0	23.3	37.3	56.0	80.6	112.9	154.8	185.8
Market Share via Licensing	%	0.00%	0.00%	0.7500%	1.50%	2.25%	3.00%	3.75%	4.50%	5.25%	6.00%	6.00%
Assumed Royalty	%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Revenue	$mm	$0	$0	$3	$7	$12	$19	$28	$41	$57	$78	$94
Gross Margin	$mm	$0	$0	$3	$7	$12	$19	$28	$41	$57	$78	$94
Gross Margin %	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
NNO Market Share via JV												
NNO Market Share	kt	0.0	0.0	0.0	4.9	11.8	21.3	34.1	51.2	73.7	103.2	123.8
Market Share via JV	%	0.00%	0.00%	0.00%	0.57%	1.14%	1.71%	2.29%	2.86%	3.43%	4.00%	4.00%
Assumed Working Interest	%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Revenue	$mm	$0	$0	$0	$16	$37	$67	$108	$162	$233	$326	$392
Gross Margin	$mm	$0	$0	$0	$5	$11	$20	$32	$49	$70	$98	$117
Gross Margin %	%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Capex per tonne	$/kg	$7.50	$7.50	$7.50	$7.50	$7.50	$7.50	$7.50	$7.50	$7.50	$7.50	$7.50
JV Capex	$mm	$0	$5	$11	$15	$21	$28	$37	$49	$47	$47	$28
Corporate Total												
Market Share	kt	0.0	0.0	5.4	17.9	35.2	58.7	90.1	131.8	186.6	258.0	309.6
Market Share	%	0%	0%	1%	2%	3%	5%	6%	7%	9%	10%	10%
Net Market Share	%	0.00%	0.00%	0.03%	0.20%	0.38%	0.55%	0.72%	0.89%	1.07%	1.24%	1.24%
Revenue	$mm	$0	$0	$3	$22	$49	$86	$136	$203	$290	$405	$486
Gross Margin	$mm	$0	$0	$3	$11	$23	$39	$61	$89	$127	$176	$211
Gross Margin %	%	n/a	n/a	100%	51%	47%	45%	45%	44%	44%	44%	44%
SG&A	$mm	$5.6	$6.2	$7.6	$7.6	$7.6	$8.7	$10.1	$11.6	$13.3	$15.3	$17.6
EBITDA	$mm	-$6	-$6	-$5	$4	$15	$30	$51	$78	$114	$161	$194
EBITDA Margin %	%	n/a	n/a	-178%	16%	31%	35%	37%	38%	39%	40%	40%
Corporate Capex	$mm	$4	$9	$15	$19	$25	$30	$39	$51	$49	$49	$30
Free Cash Flow	$mm	-$10	-$15	-$20	-$16	-$9	$0	$12	$27	$65	$112	$164
Discounted Free Cash Flow	$mm	-$9	-$12	-$14	-$10	-$5	$0	$5	$11	$23	$36	$706

Terminal Multiple	(x)	15.0x
Discount Rate	%	12.0%
Total Asset Value	$mm	$732
Net Debt	$mm	-$54
Net Asset Value (12%)	**$mm**	**$786**
NAV12% per share	**$/sh**	**$7.87**

Source: Company reports, Eight Capital

While we are confident that a NAV approach is appropriate given the nature of the business and the market, we also appreciate that it's heavily based on assumptions which stretch out to 2030. As such, we provide a sensitivity to numerous key inputs in Figure 12, as well as bear- and bull-case NAVs in Figure 13.

Figure 12: Sensitivities to Key Inputs of our Base NAV ($/share)

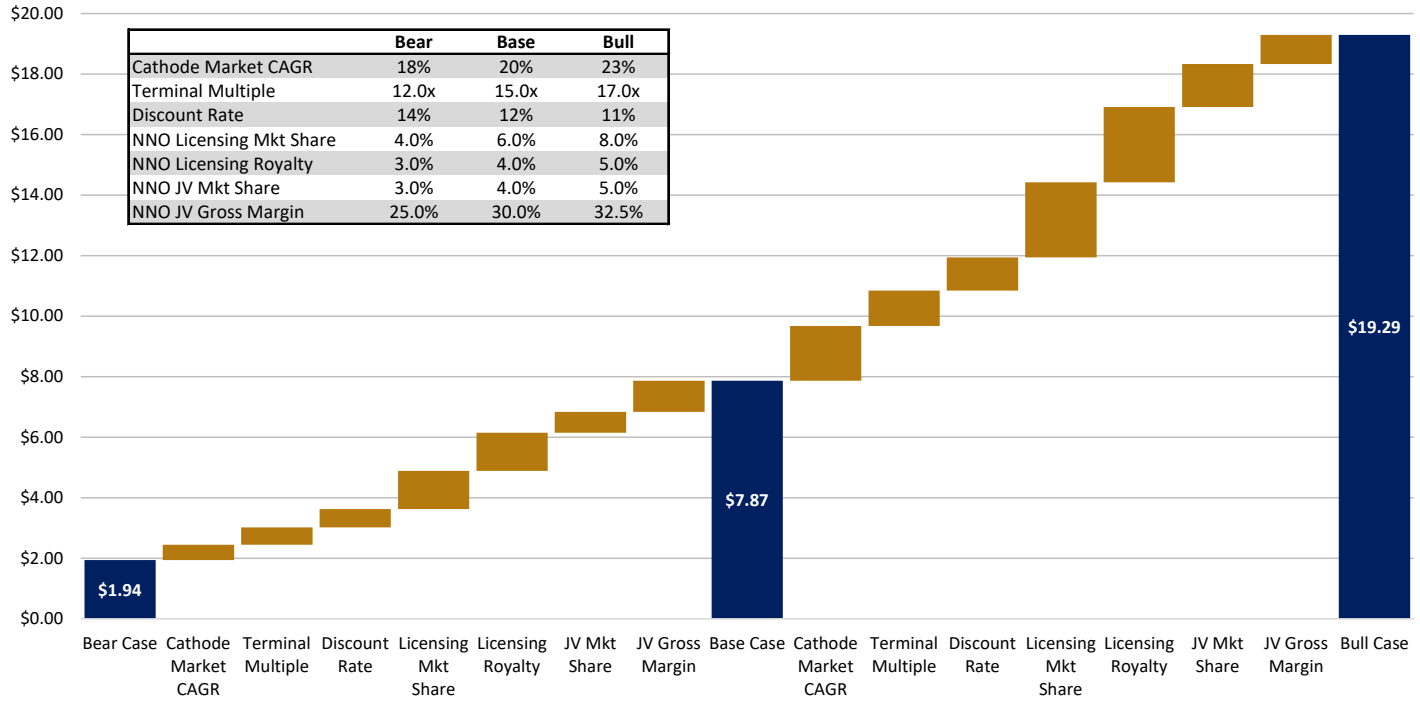


Source: Eight Capital

We believe that there is more upside than downside to li-ion cathode demand given the market's broad - and accelerating - efforts to electrify. Our bear- and bull-case scenarios reflect this dynamic, in that our bear-case reflects a 2% lower market CAGR than the base-case, while the bull-case is 3% higher.

There is significant growth in EV adoption, and a concerted effort from auto manufacturers to pivot towards electrification that will drive market growth well beyond 2030. This continued long-term growth is why we are comfortable with our 15.0x terminal multiple. We have also backstopped this multiple with a long-term market analysis that supports our 15x. Therefore, we view the more pertinent risks to our target as being related to the scale of adoption of Nano One's technology, as well as the royalty rate which the company is able to negotiate. This underscores the importance of any announcements regarding partnerships or the progression of any collaborations towards commerciality, and why we identify them as key catalysts to watch for.

Figure 13: Detailing our Bear-Base-Bull NAV Scenarios



	Bear	Base	Bull
Cathode Market CAGR	18%	20%	23%
Terminal Multiple	12.0x	15.0x	17.0x
Discount Rate	14%	12%	11%
NNO Licensing Mkt Share	4.0%	6.0%	8.0%
NNO Licensing Royalty	3.0%	4.0%	5.0%
NNO JV Mkt Share	3.0%	4.0%	5.0%
NNO JV Gross Margin	25.0%	30.0%	32.5%

Source: Eight Capital

Risks

Currently no revenue, and no guarantee of technology adoption. Although we strongly believe that Nano One's technology offers numerous benefits and is likely to be adopted, there is no guarantee of this. Neither achieving commerciality with a partner nor the scale of said adoption is a foregone conclusion. We note that the company's continued efforts toward research and development, as well as toward growing its moat of patents, help to provide defensiveness against this potential scenario.

Rapid pace of technological evolution. Even if Nano One's technology is adopted, there is no guarantee that its adoption rate will grow over time, let alone for more than a decade, as we forecast. Batteries are undergoing rapid improvements in quality and costs, which makes it difficult to predict what the next breakthrough technology will be, or how much of the market this technology will be able to permeate before being improved upon.

Protection of intellectual property. The company's success is reliant on the exclusivity of its technology and Nano One's ability to leverage it with a partner to license it, or form a joint venture. Engaging with global partners, and dealing with the ongoing evolution of battery technology, could make protecting these technologies more difficult. Additionally, protecting these patents through litigation, should the need arise, can be expensive and time consuming, and can detract from or introduce uncertainty to the company's value proposition. See Figure 17 for a summary of the company's patents.

Changing regulatory environment. The investment landscape and regulatory environment have been very favourable tailwinds for most participants across the lithium battery supply chain, including for Nano One. We recognize, however, that these factors could change. A new administration, the relaxation of electrification subsidies or new competitive technologies could all negatively affect broader electrification trends, and by extension the company's prospects.

Other macro-level risks. Many of the company's disclosed partners are global players, and political risk could negatively affect potential agreements. This includes international tax rules, currency fluctuations or global regulatory changes. Supply risks also exist within the supply chain, such as volatile raw metal prices.

Interest rate risk. Should the company pursue a capital intensive program or a joint venture, they may need to take on debt (the company is currently in a net cash position). In such a scenario, the company would be exposed to higher interest rates and credit spreads should they occur. Share prices across the sector may also be exposed in an increasing interest rate environment given the higher opportunity cost of equities, combined with elevated valuations and higher borrowing costs.

Catalysts

Commercial terms with a partnership. First and foremost, an announcement around an official agreement to deploy Nano One's technology would be very positive for the stock. It would not only be financially constructive, but it would make incremental partnerships more likely, in our view. It would also help to narrow the band on what future agreements could look like (in terms of royalty rates, working interest, etc.), which can help to calibrate forecasts for profitability and growth.

Advancement of existing partnerships. Progression of existing collaborations through either technical validation, raw material supply agreements or engineering specifications would be an encouraging sign that partnerships are moving forward towards commerciality. We note that arrangements can take years between initial discussions and formal agreements and ultimately revenues, so numerous updates may be necessary.

Additional partners. We believe that Nano One is in preliminary discussions with numerous parties who are interested in the technology; many of which are unannounced. The recent press release detailing a collaboration with the University of Michigan, for example, was previously undisclosed. Formalization of some of these discussions, or the addition of new partners, would add to the likelihood of commerciality, in our view.

More proof of concept / testing. Incremental positive test results would be supportive of Nano One's technology, and by extension its adoption. Examples include the Nano One-

affected NMC811 cathode exhibiting significantly heightened durability, or NNO's LNMO durability test.

Up-listing to a senior exchange. A NASDAQ or TSX main board listing could improve funding terms, improve trading volumes and potentially lead to index inclusions, including ESG or Cleantech ETFs. However, it could also marginally increase costs.

Positive regulatory developments. Announcements around support for the battery supply industry, such as ambitions to build out a domestic supply chain, or around incentives for electric vehicles, would be positive for Nano One; even if not immediately and directly so. We note that on March 31st, details of the Biden Administration's planned Infrastructure Bill were released, and it included a US$174 billion investment in the electric vehicle market, including funding for 500,000 charging stations.

Our NAV approach is partially reliant on the global cathode market, so any announcement increasing the size of the market would be indirectly positive for the company. In Figure 12, we detail that our NAV has an 8-9% sensitivity to a 1% change in the cathode market's growth rate out to 2030.

Further government assistance. Since inception, NNO has received over $13 million from the Government of Canada to advance its technology, including over $7 million from the SDTC (Sustainable Development Technology Canada). Last year, the company received $3.7 million. This funding was more instrumental when the company was smaller and had less access to capital for research activities; however, we note that NNO is still in a pre-revenue stage and these funds can still be very beneficial.

Relative Valuation

Because Nano One's technology is so unique, it is difficult to find an appropriate peer group. Many related companies are either too large / integrated, or are private companies which do not offer many insights in terms of valuation. Private companies that have drawn comparisons include: Sila Nanotechnologies, CAMX Power, Lionano and Coreshell Technologies.

In Figure 14, we present Nano One at its current share price and at its $8.00 target price, versus an assortment of Clean Technology providers and a basket of cleantech ETFs.

Figure 14: Comps Table - Clean Technologies, Cleantech ETFs

Company	Ticker	Sub-Category	Rating	Target	Dividend Yield	EV/Sales					EV/EBITDA				
						2021	2022	2023	2024	2025	2021	2022	2023	2024	2025
Cleantech & Renewable Energy Services															
Ameresco, Inc.	AMRC-USA	IES	NR	NR	0.0%	2.6x	2.3x	2.2x	2.0x	-	20.8x	17.7x	15.4x	14.4x	-
Cematrix Corp.	CVX-CAN		NR	NR	0.0%	1.5x	1.1x	-	-	-	9.4x	5.3x	-	-	-
Clean Energy Fuels Corp.	CLNE-USA	IES, AE	NR	NR	0.0%	9.2x	8.5x	8.3x	6.6x	-	47.9x	49.7x	36.3x	24.9x	-
Exro Technologies Inc.	EXRO-CAN	CT	BUY	$8.00	0.0%	-	-	34.3x	22.6x	13.3x	-	-	-	-	-
Greenlane Renewables Inc.	GRN-CAN	AE	NR	NR	0.0%	4.2x	3.0x	2.7x	-	-	45.2x	24.3x	19.9x	-	-
Montauk Renewables, Inc.	MNTK-USA	AE	NR	NR	0.0%	14.7x	12.4x	9.6x	8.1x	7.0x	44.7x	32.5x	18.8x	14.9x	12.3x
Pinnacle Renewable Energy, Inc.	PL-CAN	AE	NR	NR	0.0%	1.4x	1.2x	-	-	-	9.1x	7.7x	-	-	-
Questor Technology Inc.	QST-CAN	IES	NR	NR	0.0%	3.0x	2.0x	1.4x	-	-	11.4x	6.6x	4.1x	-	-
Sharc International Systems Inc.	SHRC-CAN	AE, IES	NR	NR	0.0%	-	-	-	-	-	-	-	-	-	-
Spark Power Group Inc.	SPG-CAN	IES	NR	NR	0.0%	0.8x	0.7x	-	-	-	5.4x	4.5x	-	-	-
Xebec Adsorption Inc.	XBC-CAN	AE	NR	NR	0.0%	4.0x	3.1x	2.8x	2.4x	-	-	29.7x	19.0x	15.7x	-
Integrated Energy Services (IES) - Average					0.0%	3.9x	3.4x	4.0x	4.3x	-	21.4x	19.6x	18.6x	19.6x	-
Clean Technology (CT) - Average					0.0%	-	-	34.3x	22.6x	13.3x	-	-	-	-	-
Alternative Energy (AE) - Average					0.0%	6.7x	5.7x	5.9x	5.7x	7.0x	36.7x	28.8x	23.5x	18.5x	12.3x
All - Average					**0.0%**	**4.6x**	**3.8x**	**8.8x**	**8.3x**	**10.2x**	**24.3x**	**19.8x**	**18.9x**	**17.5x**	**12.3x**
All - Median					**0.0%**	**3.0x**	**2.3x**	**2.8x**	**6.6x**	**10.2x**	**16.1x**	**17.7x**	**18.9x**	**15.3x**	**12.3x**
NNO @ Current Share Price	NNO-CA	CT	BUY	$8.00	0.0%	-	-	175.7x	21.7x	9.7x	-	-	-	131.9x	31.1x
NNO @ C$8.00 Target Price	NNO-CA	CT	BUY	$8.00	0.0%	-	-	272.6x	33.6x	15.1x	-	-	-	204.5x	48.2x
*NR=Not rated, FactSet consensus estimates															
Clean Tech ETFs															
ARK Innovation ETF		ARKK-USA			0.0%	16.2x	13.3x	10.1x	6.6x	4.9x	44.4x	43.3x	39.6x	35.7x	24.9x
First Trust Global Wind Energy ETF		FAN-US			0.9%	4.4x	4.2x	4.2x	4.2x	4.4x	15.0x	12.9x	11.8x	11.5x	10.8x
iShares Global Clean Energy ETF		ICLN-US			0.1%	10.6x	8.4x	6.9x	6.3x	5.5x	24.4x	22.5x	19.4x	20.1x	16.7x
Invesco WilderHill Clean Energy ETF		PBW-US			0.5%	14.5x	10.8x	6.4x	5.2x	4.1x	24.8x	26.3x	23.4x	24.7x	24.5x
Invesco Cleantech ETF		PZD-US			0.2%	6.7x	5.9x	5.1x	4.9x	5.1x	23.9x	22.6x	18.4x	15.2x	12.2x
Global X Funds Renewable Energy Producers ETF		RNRG-US			3.4%	7.5x	6.9x	6.5x	6.4x	7.3x	16.6x	15.5x	12.0x	11.3x	12.0x
VanEck Vectors Low Carbon Energy ETF		SMOG-US			0.1%	9.3x	7.2x	5.9x	5.3x	4.5x	28.4x	28.9x	26.0x	23.7x	23.0x
Invesco Solar ETF		TAN-US			0.1%	11.9x	10.0x	9.2x	6.7x	5.9x	27.8x	25.0x	19.1x	13.1x	10.1x
Average					**0.8%**	**9.3x**	**7.6x**	**6.3x**	**5.6x**	**5.3x**	**23.0x**	**21.9x**	**18.6x**	**17.1x**	**15.6x**
Median					**0.2%**	**9.3x**	**7.2x**	**6.4x**	**5.3x**	**5.1x**	**24.4x**	**22.6x**	**19.1x**	**15.2x**	**12.2x**
NNO @ Current Share Price	NNO-CA	CT	BUY	$8.00	0.0%	-	-	175.7x	21.7x	9.7x	-	-	-	131.9x	31.1x
NNO @ C$8.00 Target Price	NNO-CA	CT	BUY	$8.00	0.0%	-	-	272.6x	33.6x	15.1x	-	-	-	204.5x	48.2x
*NR=Not rated, FactSet consensus estimates															

Source: FactSet, Eight Capital

Management, Directors and Strategic Advisors

Leadership will play a critical role in navigating the company through the lead-up to commerciality, as well as in growing revenues beyond that point. We view the current team as having a strong combination of experience and industry connections, which has been bolstered by the addition of several experienced strategic advisors. The management team has also displayed a track record of technological innovation.

Figure 15: Leadership Overview

Dan Blondal **CEO, Director & Founder**	Mr. Blondal has 30 years of experience as a professional engineer, managing high growth technology in a career that has spanned materials handling, medical devices, industrial printing, nuclear fusion and materials science. Mr. Blondal brings significant experience in systems engineering, physics and business. As Product and Technology Manager at Creo and Kodak, he led strategically vital initiatives valued at $20M annually to leverage software, laser and chemical systems for high-quality printing.
John Lando **President, Director & Founder**	Mr. Lando has 30 years of experience in venture capital management, equity markets and the financing of public companies. After trading equities at RBC Dominion Securities, he transitioned to senior management roles at early stage venture companies, including New World Resource Corp. and Northern Lion Gold.
Dr. Stephen Campbell, PhD, CSci, CChem, MRSC **Chief Technology Officer**	Dr. Campbell has 25+ years of experience leading industrial automotive research in electrochemical systems. Dr. Campbell served 7 years as Principal Scientist at Automotive Fuel Cell Cooperation Corp. and, he held key roles at Ballard Power Systems as Principal Scientist and Senior Scientist between 1994 and 2008. Dr. Campbell has 20+ patents to his name and adds 20 years of hands-on experience in industrial research developing new technologies through to series production for the automotive sector. Dr. Campbell received his Ph.D. in Semiconductor Electrochemistry from the University of Southampton in 1987 and completed his BSc (Hons.) 1st class in Physical Sciences at Coventry Polytechnic in 1984.
Alex Holmes **Chief Operating Officer**	Mr. Holmes has spent more than 15 years as a senior executive with a number of public companies. Most recently, he served as the CEO of Plateau Energy Metals, a public company advancing a world-class hard rock lithium project in tandem with a uranium asset in Peru. Prior to this, Mr. Holmes co-founded a technology start-up, leading it from prototype to commercialization in a short period of time, and was a partner and co-founder of Oxygen Capital Corp. where he led the business development for all affiliated companies. Mr. Holmes holds a M.Sc. in Investment Management, graduating with Distinction from The Business School, City University of London.
Paul Matysek, M. SC. **Chairman and Director**	Serial entrepreneur, geochemist and geologist with over 40 years of experience in the mining industry. Since 2004 as CEO or Chairman, Mr. Matysek has primarily focused on the exploration, development and sale of five publicly listed companies, in aggregate worth over $2 billion. Most recently, he was Executive Chairman of Lithium X Energy Corp. which was sold to Nextview New Energy Lion Hong Kong Limited ("Nextview") for $265 million in cash. He was awarded EY Entrepreneur of the Year for Mining & Resources in September 2018.
Dr. Joseph Guy **Director**	Dr. Joseph Guy is a President of Patent Filing Specialist, Inc. and a Patent Agent focusing on complex technologies including material science, electronic components, pharmaceuticals and medical products. He has more than 23 years of experience prosecuting patents and serving as expert witness on intellectual property matters. Dr. Guy was awarded a Ph.D. in Chemistry from the University of Wisconsin-Milwaukee in physical inorganic chemistry with a focus on organometallic complexes. Dr. Guy has authored numerous references in peer-reviewed journals and has written and prosecuted over 1000 U.S. and foreign patent applications, with more than 300 issued U.S. Patents and numerous foreign patents.
Lyle Brown **Director & Audit Committee Ch.**	Mr. Brown is a CPA, CA and holds a Bachelor of Commerce from the University of British Columbia. Mr. Brown has been a partner since 1991 in the accounting firm of Culver & Co. in Vancouver, British Columbia, serving clients in a wide range of industries, and is familiar with the reporting requirements of public companies. Mr. Brown serves on the boards of Northern Lion Gold Corp. (TSXV), New World Resource Corp. Mr. Brown serves on the boards of Northern Lion Gold Corp. (TSXV), New World Resource Corp. (TSXV) and FEC Resources Inc. (Nasdaq OTC).

Source: Company reports

Figure 16: Strategic Advisors

Joe Lowry **Strategic Advisor**	Joe Lowry has 20 years experience in senior roles with leading lithium producers and an extensive network in the global cathode supply chain network. Mr. Lowry has worked for top lithium producers in the US, Japan and China, and has extensive worldwide market experience, a large contact base and a good pulse on the lithium market. Mr. Lowry is widely respected and known as one of the world's experts in the lithium sector. After a two-decade tenure working in senior positions in leading international lithium companies, Mr. Lowry formed Global Lithium LLC as an advisory firm in 2012. Global Lithium LLC has been successfully supporting lithium producers, users, investors, hedge funds and governments.
Dr. Byron Gates **Strategic Advisor**	Dr. Byron Gates collaboratively assists the company in determining correlations between structure, function, and properties of new lithium ion battery materials. Dr. Gates is a Tier II Canada Research Chair in the Department Chemistry at Simon Fraser University, investigating the surface and interface chemistry of nanomaterials and is the Head of the Centre for Soft Materials in 4D LABS, a materials research institute at SFU. Dr. Gates' work includes a series of analytical and materials studies to prepare and analyze the surface chemistries of nanostructured materials. Dr. Gates received his M.Sc. and Ph.D. from the University of Washington working with Professor Younan Xia and was a postdoctoral fellow at Harvard University working with Professor George M. Whitesides.
Gord Kukec **Strategic Advisor**	Mr. Kukec works with Senior Management to develop and implement commercial strategies as well as annual business plans. He has 25+ years experience in senior executive roles responsible for innovating and adapting commercial and IT strategy at various international Canadian corporations. Since 2010 Mr. Kukec has been an independent advisor, consultant and board member focused on how emerging environmental and information technology developments, such as climate change and cybersecurity, impact business transformation, corporate strategy and board governance. He currently sits on the board of BC Ferry Services Inc. and Solshare Energy Corp. Mr. Kukec received his BA, Economics from University of Calgary, MBA from Queen's University, is certified in Governance of Enterprise Information Technology from ISACA (CGEIT) and is a holder of the Institute of Corporate Directors Director designation (ICD.D).
Robert Morris **Strategic Advisor**	Robert is the Managing Director of Morris Consulting Corporation, a consultancy and advisory firm providing services to the base metals industry. Founded in 2019, the company's clients include top tier mining and trading companies. Robert has more than 15 years' experience as a senior executive in the mining industry, most recently with Vale, where he was Executive Vice-President, Sales and Marketing, Base Metals. Robert was instrumental in developing Vale's strategic direction relating to the company's electric vehicle strategy. Specifically, how to position Vale's vast nickel and cobalt assets towards the production of essential battery materials. While based in Tokyo he was president of Vale's Japanese subsidiary Vale Japan Ltd., managing the company's nickel production assets and leading the sales and business development activities covering nickel and cobalt specialty products. Prior to Vale, Robert was Managing Director at Umicore Greater China responsible for marketing Umicore's line of cathode battery materials to the China market. Robert is also a non-executive Director at Giga Metals Corporation, a mining company, developing one of the world's largest undeveloped nickel and cobalt sulphide deposits that is geared toward supplying the future demand for battery metals to fuel the growing electric vehicle industry.

Source: Company reports

Patents and Proprietary Technology

Protecting Nano One's technology will be key to its monetization. The company has a robust portfolio of patents, as summarized in Figure 17. We believe that it will be important for the company to continue to expand its patent base as it becomes better understood, and are encouraged by the company's continued innovation.

Figure 17: Nano One Patents

Patent Family	Short Description	Title
US 9,136,534 CA 2,906,009	Method of forming a powder by generation of a complexecelle	Complexometric Precursor Formulation For Industrial Production Of High Performance Fine And Ultrafine Powders And Nanopowders For Specialized Applications
US 9,159,999 US 10,446,835 CA 2,905,984	Method of forming a powder by formation of a surface interface	Complexometric Precursor Formulation Methodology For Industrial Production Of Fine and Ultrafine Powders and NanoPowders of Layered Lithium Mixed Oxides for Battery Applications
US 9,698,419 TW I517487 US 10,283,763 CN 105594023 JP 6271599 KR 10-1839000	Battery having a defined discharge capacity, defined porosity, low sodium content and low sulfur content.	Complexometric Precursor Formulation Methodology for Industrial Production of Fine and Ultrafine Powders and Nanopowders of Layered Lithium Mixed Oxides for Battery Production
CA 2905525	Reactor	Reactor Vessel for Complexecelle Formation
US 10,374,232 KR 10-1854708	NMC prepared by the Nano One Process	Complexometric Precursor Formulation Methodology for Industrial Production of Fine and Ultrafine Powders and Nanopowders for Lithium Metal Oxides for Battery Applications
TW I672852	Calcined powder comprising a surface stabilized with $MnPO_4$. Method of forming the powder and battery comprising the powder.	Phosphate Stabilized Lithium-ion Battery Cathode
US 10,189,719	Process for the formation of lithium metal oxide including recycling of raw materials	Improved Process for the Manufacture of Lithium Metal Oxide Cathode Materials

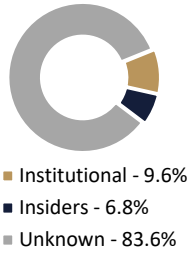
Source: Company reports

Ownership Summary and Financial Forecasts

Figure 18: Nano One Ownership and Trading Summary

Top Institutions	% Outstanding
Total	**9.61%**
Formidable Asset Management LLC	3.89%
US Global Investors, Inc. (Asset Management)	3.78%
BN & Partners Capital AG	1.25%
Taylor Wealth Management Partners LLC	0.25%
GR Asset Management GmbH	0.20%
Toroso Investments LLC	0.17%
BNP Paribas Asset Mgmt USA	0.08%
-	-
-	-

Top Insiders	% Outstanding
Total	**6.92%**
Matysek Paul Frank	2.80%
Lando John E	2.02%
Blondal Dan	1.59%
Brown Lyle	0.25%
James Briscoe	0.14%
Guy Joseph	0.12%
-	-
-	-
-	-



Source: Company reports, Eight Capital

Figure 19: Balance Sheet

Balance Sheet	2018A	2019A	2020A	Q1/21E	Q2/21E	Q3/21E	Q4/21E	2021E	2022E	2023E	2024E	2025E
Current Assets												
Cash	$3,153	$1,748	$27,750	$54,412	$52,184	$49,984	$47,811	$47,811	$34,485	$17,406	$6,501	$3,309
Trade and other receivables	$347	$148	$362	$362	$362	$362	$362	$362	$362	$362	$362	$362
Prepaid expenses	$44	$25	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42
Short-term investment	$0	$199	$1,009	$1,101	$1,188	$1,271	$1,350	$1,350	$1,603	$1,735	$1,771	$1,760
Total Current Assets	$3,545	$2,119	$29,163	$55,916	$53,776	$51,659	$49,565	$49,565	$36,492	$19,545	$8,676	$5,473
Non-current assets												
Cost	$2,757	$3,276	$4,266	$5,266	$6,266	$7,266	$8,266	$8,266	$16,895	$32,003	$51,370	$76,254
Foreign Exchange difference	$0	$0	$0					$0	$0	$0	$0	$0
Accumulated Depreciation	-$2,029	-$2,508	-$2,781	-$2,979	-$3,213	-$3,486	-$3,796	-$3,796	-$5,845	-$9,795	-$16,411	-$26,450
Plant and Equipment	$729	$768	$1,485	$2,287	$3,053	$3,780	$4,470	$4,470	$11,050	$22,208	$34,959	$49,804
Deposits	$0	$21	$288	$288	$288	$288	$288	$288	$288	$288	$288	$288
Intangible assets	$14	$24	$23	$23	$23	$23	$23	$23	$23	$23	$23	$23
Total Non-Current Assets	$742	$814	$1,796	$2,598	$3,363	$4,091	$4,781	$4,781	$11,360	$22,518	$35,269	$50,115
Total Assets	$4,288	$2,933	$30,959	$58,514	$57,139	$55,749	$54,346	$54,346	$47,852	$42,064	$43,945	$55,588
Current Liabilities												
Accounts Payable and accrued liabilities	$175	$135	$529	$529	$529	$529	$529	$529	$529	$529	$529	$529
Lease payable - current	$0	$102	$89	$89	$89	$89	$89	$89	$89	$89	$89	$89
Deferred gov't assistance	$0	$676	$821	$821	$821	$821	$821	$821	$821	$821	$821	$821
Deferred revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Current Liabilities	$175	$913	$1,439	$1,439	$1,439	$1,439	$1,439	$1,439	$1,439	$1,439	$1,439	$1,439
Non-current liabilities												
Lease payable	$0	$152	$621	$621	$621	$621	$621	$621	$621	$621	$621	$621
Loans payable	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Decommissioning Provision	$0	$0	$0					$0	$0	$0	$0	$0
Total Non-Current Liabilities	$0	$152	$621	$621	$621	$621	$621	$621	$621	$621	$621	$621
Shareholders' Equity												
Share Capital	$18,844	$20,069	$50,734	$79,651	$79,651	$79,651	$79,651	$79,651	$79,651	$79,651	$79,651	$79,651
Contributed surplus	$0	$0	$0					$0	$0	$0	$0	$0
Accumulated other comprehensive (loss) income	$2,912	$3,163	$4,726	$5,126	$5,526	$5,926	$6,326	$6,326	$7,926	$9,526	$11,126	$12,726
Accumulated deficit	-$17,642	-$21,364	-$26,562	-$28,323	-$30,099	-$31,888	-$33,692	-$33,692	-$41,785	-$49,174	-$48,892	-$38,850
Total Shareholders' Equity	$4,113	$1,868	$28,898	$56,454	$55,078	$53,689	$52,285	$52,285	$45,792	$40,003	$41,885	$53,527
Total Liabilities and Shareholders' Equity	$4,288	$2,933	$30,959	$58,514	$57,139	$55,749	$54,346	$54,346	$47,852	$42,064	$43,945	$55,588

Source: Company reports, Eight Capital

Figure 20: Income Statement

Income Statement	2018A	2019A	2020A	Q1/21E	Q2/21E	Q3/21E	Q4/21E	2021E	2022E	2023E	2024E	2025E
Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,732	$22,171	$49,277
COGS	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	-$10,930	-$26,231
COGS (%)	-	-	-	n/a	n/a	n/a	n/a	-	-	0%	49%	53%
Gross profit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,732	$11,242	$23,046
Operating expenses												
Employee Compensation	-$1,363	-$1,735	-$1,767	-$600	-$600	-$600	-$600	-$2,400	-$3,000	-$4,000	-$4,000	-$4,000
Corporate, professional, and office	-$349	-$377	-$1,483	-$250	-$250	-$250	-$250	-$1,000	-$1,000	-$1,200	-$1,200	-$1,200
Insurance	$0	$0	$0					$0	$0	$0	$0	$0
Travel & entertainment	-$97	-$119	-$59	-$50	-$50	-$50	-$50	-$200	-$200	-$400	-$400	-$400
Advertising and marketing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Project Development costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
			$0					$0	$0	$0	$0	$0
Selling, general, and administrative	-$1,809	-$2,231	-$3,308	-$900	-$900	-$900	-$900	-$3,600	-$4,200	-$5,600	-$5,600	-$5,600
Research (recoveries) expenses, net	-$1,075	-$1,070	-$229	-$500	-$500	-$500	-$500	-$2,000	-$2,000	-$2,000	-$2,000	-$2,000
Share-based compensation	-$2,117	-$428	-$1,652	-$400	-$400	-$400	-$400	-$1,600	-$1,600	-$1,600	-$1,600	-$1,600
Depreciation & amortization	-$23	-$56	-$85	-$53	-$63	-$73	-$83	-$271	-$546	-$1,053	-$1,764	-$2,677
Income (loss) from operating activities	-$5,025	-$3,783	-$5,274	-$1,853	-$1,863	-$1,873	-$1,883	-$7,471	-$8,346	-$7,521	$278	$11,169
Bad debts	$0	$0	$0					$0	$0	$0	$0	$0
Unrealized FX Loss (gain)	$0	$0	$0					$0	$0	$0	$0	$0
Gain on conversion of debt to equity	$0	$0	$0					$0	$0	$0	$0	$0
Finance expense	$0	-$32	-$27	-$11	-$11	-$11	-$11	-$43	-$43	-$43	-$43	-$43
Interest Rate	-	13%	7%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Finance income	$28	$34	$89	$102	$98	$94	$90	$383	$296	$175	$78	$38
Net income (loss) before income taxes	-$4,998	-$3,781	-$5,212	-$1,761	-$1,775	-$1,790	-$1,804	-$7,130	-$8,093	-$7,389	$313	$11,164
Current taxes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	-$31	-$1,116
Deferred taxes	$0	$0	$0					$0	$0	$0	$0	$0
Income (loss) for the period	-$4,998	-$3,781	-$5,212	-$1,761	-$1,775	-$1,790	-$1,804	-$7,130	-$8,093	-$7,389	$282	$10,048
Foreign currency translation differences	$0	$0	$0					$0	$0	$0	$0	$0
Comprehensive income (loss) for the period	-$4,998	-$3,781	-$5,212	-$1,761	-$1,775	-$1,790	-$1,804	-$7,130	-$8,093	-$7,389	$282	$10,048

Source: Company reports, Eight Capital

Figure 21: Statement of Cash Flows

Statement of Cash Flows	2018A	2019A	2020A	Q1/21E	Q2/21E	Q3/21E	Q4/21E	2021E	2022E	2023E	2024E	2025E
Cash flow used in Operating Activities												
Net Loss	-$4,998	-$3,781	-$5,212	-$1,761	-$1,775	-$1,790	-$1,804	-$7,130	-$8,093	-$7,389	$282	$10,043
Adjustment for:												
Depreciation and amortization	$1,016	$481	$274	$197	$235	$272	$310	$1,015	$2,049	$3,951	$6,616	$10,038
Expected credit loss	$0	$0	$0					$0	$0	$0	$0	$0
Deferred Income tax expense	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Share-based compensation	$2,117	$428	$1,652	$400	$400	$400	$400	$1,600	$1,600	$1,600	$1,600	$1,600
Finance expense	$0	$32	$27	$11	$11	$11	$11	$43	$43	$43	$43	$43
Accretion expense	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Finance Income	$1	-$2	-$89	-$102	-$98	-$94	-$90	-$383	-$296	-$175	-$78	-$32
Before change in non-cash items	-$1,864	-$2,843	-$3,348	-$1,255	-$1,228	-$1,200	-$1,173	-$4,856	-$4,698	-$1,970	$8,462	$21,691
After change in non-cash items	-$2,110	-$2,010	-$2,923	-$1,255	-$1,228	-$1,200	-$1,173	-$4,856	-$4,698	-$1,970	$8,462	$21,691
Cash used in operating activities	-$2,110	-$2,010	-$2,923	-$1,255	-$1,228	-$1,200	-$1,173	-$4,856	-$4,698	-$1,970	$8,462	$21,691
(Addition) decrease to restricted cash	$0	$0	$0					$0	$0	$0	$0	$0
(Addition) decrease to plant and equipment	-$199	-$430	-$791	-$1,000	-$1,000	-$1,000	-$1,000	-$4,000	-$8,629	-$15,109	-$19,367	-$24,884
Cash from investing activities	-$210	-$537	-$1,512	-$1,000	-$1,000	-$1,000	-$1,000	-$4,000	-$8,629	-$15,109	-$19,367	-$24,884
Net Proceeds on issue of share capital and warrants	$800	$1,191	$30,575	$28,917	$0	$0	$0	$28,917	$0	$0	$0	$0
Payment of lease liabilities	$0	$0	-$138					$0	$0	$0	$0	$0
Other Costs	$0	-$50	$0					$0	$0	$0	$0	$0
Net proceeds of loans payable	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Cash from financing activities	$800	$1,141	$30,438	$28,917	$0	$0	$0	$28,917	$0	$0	$0	$0
Increase (decrease) in cash for the period	-$1,520	-$1,406	$26,003	$26,662	-$2,228	-$2,200	-$2,173	$20,061	-$13,326	-$17,079	-$10,905	-$3,193
Effect of exchange rate fluctuations on cash	$0	$0	$0					$0	$0	$0	$0	$0
Cash, beginning of period	$4,673	$3,153	$1,748	$27,750	$54,412	$52,184	$49,984	$27,750	$47,811	$34,485	$17,406	$6,501
Cash, end of period	$3,153	$1,748	$27,750	$54,412	$52,184	$49,984	$47,811	$47,811	$34,485	$17,406	$6,501	$3,309

Source: Company reports, Eight Capital

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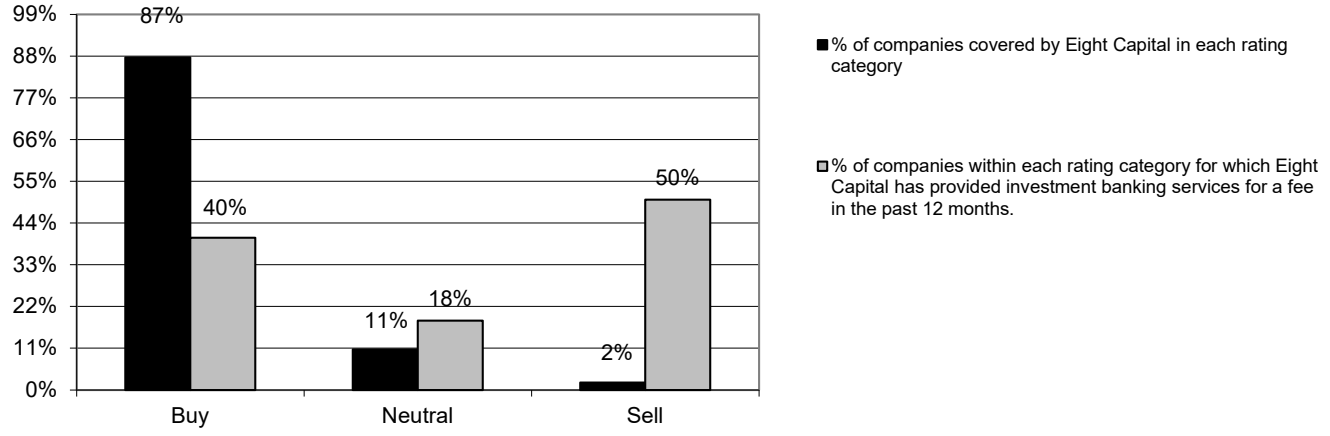

As at March 31, 2021
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