

ELECTROVAYA, INC.**(OTCMKTS: EFLVF, TSX: EFL)**

An Update on Recent Events with Dr. Raj DasGupta

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KEY POINTS

- Electrovaya aims to complete the uplisting of its stock on the NASDAQ in early 2023. In the latest capital raising, this was one of the attractions examined by both current institutional investors and prospective investors.
- In preparation for the uplisting, the company is trying to shore up the balance sheet by amending the debt terms in its favor and fully repaying the promissory note account.
- Electrovaya's first US plant will create its own high-performance lithium-ion cells and batteries. The new plant, located in Jamestown, New York, will enable the firm to vertically integrate essential components and increase gross margins (up to 10%) in the battery manufacturing sector, strengthening the supply chain.
- The Jamestown factory is expected to begin cell production in early 2024, with the project's financing likely to be finalized by January 2023.
- Demand in the industry is robust and people have adapted to price increases. After severe volatility over the last couple of years, inflationary pricing on battery system components is beginning to normalize. The price of lithium carbonate was escalating quickly and it is still high and costly, but the pace of increase has slowed.
- Electrovaya has a few goals for 2023: (1) to continue its deployments and growth in the material handling sector; (2) a positive bottom line; (3) to complete the NASDAQ listing; and (4) to establish more relationships with OEMs and other key players.
- Electrovaya's separator and electrolyte technologies are its secret ingredient; the rest of the cell is straightforward. Its batteries are based on a membrane made entirely of ceramic. It contains 90% ceramic by weight. Unlike ordinary polymer lithium-ion separators, this material is resilient at high temperatures. It delivers prolonged cycle life owing to its high density when paired with a novel electrolyte and cell design.
- Our prior content on EFL can be accessed [here](#). The fireside chat from November 3, 2022, can be accessed [on demand](#).

KEY STATISTICS

Price	\$0.73
52-Week Range	\$0.41 - \$1.01
Avg. Daily Vol. (30 days)	61,496
Shares Out (MM)	164.67
Market Cap (\$MM)	\$120.20
Enterprise Value (\$MM)	\$135.34
Revenue TTM (\$MM)	\$19.17
Fiscal Year-End	September

Source: YCharts, as of January 3, 2022

OUR INSIGHTS**The Opportunities**

Electrovaya is uniquely positioned to leverage the rapid growth in lithium-ion battery demand. Its strategic relationships with major OEMs, including Raymond and Toyota, demonstrate the company's progress and technology. In addition, Electrovaya batteries have started being used by major material handling customers, including Walmart, Mars, Home Depot, and a large online retailer. There is also a robust opportunity to retrofit existing lithium-ion units from lead-acid batteries. The company believes there are additional opportunities in buses and Class 3 trucks and recently inked a supply agreement with Vicinity Motors. Solid-state batteries represent the second growth stage and are a sea change technology under development, with 2023 targeted for launch.

The Obstacles

The company has successfully pivoted from e-passenger cars to material handling and commercial vehicles. However, execution risk is minimized as a few thousand Infinity batteries for e-forklifts have been recently delivered to sophisticated Fortune 100 customers. The performance and commercial viability of the company's SSB platform is still unknown.

COMPANY OVERVIEW

Electrovaya is a leading manufacturer of safe and long-lasting lithium-ion batteries with differentiated performance and safety attributes, according to the company. The company has two primary battery platforms: Infinity and Solid State. The Infinity battery platform targets commercial vehicles, including lithium-ion e-forklift, e-bus, and e-trucks. This product has been launched commercially through global partners, including Toyota, Raymond, and Walmart. To date, Infinity sales have been primarily to the material handling industry, where lithium-ion batteries are replacing lead-acid batteries and, to some degree, fuel cells. The company's batteries can also be used in larger grid-scale energy storage. The Solid State platform (SSB) is under development and targeted to launch in 2023, focusing on creating the lowest initial \$/energy (kWh) and highest energy density. The target market for SSB will be e-passenger cars where a low initial cost (sticker price) is required. Electrovaya sells battery solutions through two primary channels: OEM strategic supply agreements and a direct sales force. It primarily utilizes strategic partners for battery sales into new equipment or vehicle production and its direct sales force for the retrofit market. In addition to the two battery platforms, Electrovaya also develops cells, modules, battery management systems, software, and firmware necessary to deliver the systems. Electrovaya has substantial intellectual property in the lithium-ion battery sector and continues to conduct research and development activities in lithium-ion batteries, with more than 100 patents in its portfolio. In June 2021, a new operating division named [Electrovaya Labs](#) was formed to focus on the R&D and commercialization of other disruptive technologies, including next-gen solid-state cells and a unique patented electrode processing technology. Electrovaya Inc. was founded in 1996 and is headquartered in Mississauga, Canada.

The Technology

Infinity Battery Platform: According to Grand View Research, the global lithium-ion battery market was valued at \$53.6 billion in 2020 and is expected to cross \$216.5 billion by 2028, representing a CAGR of 19%. The Infinity lithium batteries are based on proprietary ceramic technologies, allowing improved safety and longevity without compromising energy and power. The EV-44 is Electrovaya's primary lithium-ion ceramic cell and meets the most stringent safety, energy density, cycle life, and performance standards. In addition, Electrovaya's battery systems are designed to be scaled through a modular approach, which provides flexibility for an application's specific capacity requirements.

Solid State Platform: According to Grand View Research, the global solid-state battery market was valued at \$590.9 million in 2020 and is expected to cross \$5.3 billion by 2028, representing a CAGR of 36%. Electrovaya believes it is well-positioned for this next-generation battery technology. Its division, Electrovaya Labs, focuses on developing solid-state battery technology, among others, and has targeted 2023 for the debut of its solid-state battery platform.

Battery Management Systems: Electrovaya's 5th Generation BMS provides the highest levels of cell balancing, IoT functionality, and safety. It is reviewed and certified by UL to UL991 and UL1998 for specific applications, and it is available for both low- and high-volume battery systems. Electrovaya's hardware and firmware engineering team keep advancing and improving this technology to keep up with the increasing demands of the e-mobility industry. Electrovaya has launched a cloud-based battery analytics system for recurring revenues with a subscription model. The system monitors battery health, utilization, and charging to provide customers with optimized fleet and charging management. Furthermore, the system improves the capability and efficiency of troubleshooting and maintenance. Several customers have started using this analytics system.

The Markets

Material Handling: The material handling industry is undergoing a massive sea change from lead-acid batteries to alternative power sources, including lithium-ion and fuel cells. Electrovaya is having notable success penetrating the material handling market as management believes it has arguably the highest-performing battery solution today. In addition, the company's customers have proven meaningful RIOs in material handling compared with lead-acid, showing paybacks as short as a month, opening a significant opportunity for new units sold and retrofits.

E-Mobility: In October 2021, Electrovaya announced a strategic supply agreement with e-bus and e-truck manufacturer [Vicinity Motor Corp.](#) for EV buses and fully electric VMC I200 Class 3 trucks. Management believes this is opening a new market for its batteries, targeting further development and commercialization in this market. The company's solid-state battery platform will also target this market, with an expected launch date in 2023.

EXECUTIVE DISCUSSION

Executive in Focus: Dr. Raj DasGupta has been with ElectroVaya since 2009 and serves as COO.

Shawn Severson: Raj, you've been busy; lots to talk about. I guess we will start with the most recent event, which is the capital raise. And obviously, I'd certainly like to hear your views on that and review its reasoning. What do you think it does for you, and where can it take you over the next six months?

Raj DasGupta: It is a big piece of news. Overall, we're very excited to have support from those investors, including the lead investor and the others, as they are bullish on the prospects for ElectroVaya. Many of these we're already existing institutional investors for the most part. Through this process, they are very excited to see ElectroVaya continue to grow. The NASDAQ uplisting angle of it is key to these folks and us as a company and part of this.

This is pre-NASDAQ, and we intend to complete an uplisting early next year.

Shawn Severson: And what are the short-term capital needs that you see?

Raj DasGupta: Well, we have relied heavily on our debt partner throughout our recent growth, and that's been terrific. They've been with us for the long haul. Again, these long-term partnerships are key to what we're trying to do here, but that said, it's come to a point where we need to shore up the balance sheet. This is done from a fundamental standpoint and in preparation for NASDAQ uplisting. There are requirements concerning the balance sheet, and then this capital raise puts us in that position to be compliant.

So that's a key aspect. The other is to reduce and then restructure our working capital facilities. So, debt costs have been relatively high for ElectroVaya, especially over the last six months or so. This will allow us to renegotiate and refinance that.

Shawn Severson: Let's talk about Jamestown, and for investors who are new to the story, talk about the expansion plans there and why this is important, including the onshoring aspect. Why are you doing it, and what is it?

Raj DasGupta: Jamestown is our reshoring plan right now. Jamestown is a city about an hour South of Buffalo, New York, a great manufacturing town, with great folks living there and other strong companies manufacturing in

that region. ElectroVaya has relied heavily on contract manufacturing for the last several years, which has been good for us as a company.

It enabled us to scale up when needed and not rely on our capital to build capacity. That said, we're growing up. That's the theme of what we're discussing here. And by reshoring and vertically integrating some of these components, especially the cell component, which is the largest cost component of our battery systems, should fundamentally increase our gross margins by a fairly substantial degree. Just back of the envelope, we were looking at about an 8% to 10% increase in gross margins by vertically integrating that key component.

So fundamentally, this made sense with the Inflation Reduction Act or without. There has never been a better time to consider reshoring production into the U.S., Given the Inflation Reduction Act and the strong appetite to fund these types of projects, whether through debt or grants. So, we are planning to leverage all that we can. And the IRA, the Inflation Reduction Act, has very strong incentives for cell and module production. I think it's about \$35 per kilowatt hour at the cell level and another \$10 per kilowatt hour at the module level. It's a very attractive and very forward-looking piece of the legislature there.

Shawn Severson: Your visibility and your revenue have also come around, and as such, a vote of confidence for establishing manufacturing as well, I assume. Taking that in-house has margin benefits, and the revenues have supported this move.

Raj DasGupta: Yes, these last 12 months have, we've been executing on scaling up the production that we have in Mississauga, Ontario, and we demonstrated that with a strong increase in our fiscal fourth quarter, which ended September 30, where we did nearly \$10 million in deliveries, which was a record for us as a company and puts us in a great position for the fiscal year 2023.

Shawn Severson: I want to discuss the Inflation Reduction Act, but before we do, I have to ask questions about today's supply chain and the inflationary environment. I know it had some negative impact on costs and components, and best we can tell, things haven't gotten much better, at least in the broader supply chain and in the industry; how do you feel you are positioned, and how have you managed that recently?

Raj DasGupta: So, on the price, inflationary prices on components related to the battery systems are starting to stabilize to some degree. Last year was just extreme. Lithium carbonate pricing was going up dramatically; it is still up and expensive, but the rate of change is no longer present.

The costs are still higher than they were a year or two ago, but I think the industry has accepted that. And that's not slowing down demand in any way. But as a company, we have been extremely nimble, and I have to give a lot of credit to our engineering department; when they noticed chips were going to be short in supply, we immediately pivoted to designing in easier to procure chips, big engineering efforts, but it has paid off, where a lot of companies have had to extend lead times significantly on their products, we've managed to stay ahead of that.

So overall, the supply chain has been a whack-a-mole of problems, but we're pretty good at hitting it with the hammer.

Shawn Severson: Let's go and talk about the Inflation Reduction Act, IRA, and specifically, what it's meant to you and how you plan to leverage it.

Raj DasGupta: Fundamentally, this is a wonderful thing to see happen. This is how you kick-start a domestic industry. And it's great that the U.S. administration is pushing that to this degree. It is something that Asian countries have been doing for a long time and has made it difficult for North American companies to compete, especially in this sector, the solar sector, and others. This help to level the playing field.

We're very excited about our approach to leveraging it through our Jamestown expansion. We hope to get that facility up and running and produce cells made in the USA as soon as possible.

Shawn Severson: Do you have a timeframe we should expect regarding the progress we can look to regarding Jamestown?

Raj DasGupta: It does take some time to set up a battery facility, but it doesn't happen overnight. There's also the financing angle of it, which we're aiming to complete by, let's say, January this year; that's our target.

And then after that, you have to wait for equipment, and you have to get it commissioned, etc. We're looking at cell production in early 2024. That said, on battery

system assembly and battery systems, whether for our material handling markets or other markets. The Jamestown facility will also support further growth on top of what we're doing in Mississauga, so we're very proud of what we scaled up here in Mississauga, especially over the summer, doing 10 million in the quarter. This was significant, especially towards the end of the quarter in September. We were running essentially one shift but operating it very efficiently. And with full staffing, we achieved our goal. So we have further growth that we can leverage here in the Mississauga facility, but the Jamestown facility will help augment that as well.

Shawn Severson: And I know we talked a little bit about the current conditions and the supply chain inflation, but in lithium-ion batteries, there are some real structural long-term issues right in the supply chain. How are you navigating lithium supply? We're talking about domestic resources and things like that. But let's go to the supply chain security and availability, as discussed in the battery industry today.

Raj DasGupta: Yes, so ElectroVaya has been in the battery space for a long time. We have long-standing relationships with many material suppliers, and we'll continue to leverage that. And that's how we've remained a key player despite having a relatively low production volume.

That said, we are looking very carefully at how we can leverage some of the domestic supply that's starting to come up. We are speaking with several suppliers looking to set up domestic manufacturing. That will ultimately help us, as it shortens the lead time, shortens the shipping and improves the security of supply. So that's the way I see the industry going in.

ElectroVaya's magic sauce here is in our separator and electrolyte technologies, the rest of the cell is not unique, but we leverage existing supply chains for that.

Shawn Severson: We touched on it earlier just in terms of visibility, but could you give us a quick review of the financial highlights year-to-date? It looked like big and continued improvements into the fourth quarter, but let's address the year-over-year improvements. I think it's been a bit of a breakout year for the business, and you are showing revenue, which is rare in by any means in the battery industry!

Raj DasGupta: Yes, good point on the battery industry. ElectroVaya, I think, is unique. But we're very close to being profitable here. I expected our fiscal year's fourth quarter of 2022, ending in September, would have been an EBITDA-positive quarter if it weren't for high finance costs, and we would have been cash positive. So, we're tracking in the right direction.

In terms of gross margins, I don't think you find many battery or energy storage players that can sell batteries at the prices we can. And the reason ElectroVaya can do that is we provide our customers with a value proposition driven by our technology. So that's fundamentally a longer cycling and better safety battery system. And to those customers, it saves them money. They're willing to pay a premium for this technology because it is a lower-cost solution for them. And that's a great business model that we have. And we're going to continue to grow and leverage that technology advantage.

Shawn Severson: And that was a strategic move by you, right? If we go back to the long history of the business in automotive and passenger vehicles. Can you quickly talk about some of the strategic decisions you made that put you into this position today?

Raj DasGupta: Yes, great question, Shawn. If you look back at the history of the company, up until 2018, we were very much focused on the automotive space. That's what gets everyone excited. That's what we were excited about. But that said, we have this technology that was getting much better cycle life and much better safety, and the automotive companies thought it was a great piece of technology.

But were they willing to pay a premium for it? Not really, because if you look at any electric vehicle, it's about price and range. And it's not the market in that we could get strong gross margins in any way. So ElectroVaya was on a path to bankruptcy back in 2017. And we decided to pivot. We shrunk the company significantly in 2018. And we focused our efforts and leveraging this technology for that heavy-duty space. The first market is material handling.

Now that that has paid off nicely, we're doing well in this segment. We have great partnerships, whether they be with companies like Raymond Corp. or all our Fortune 500 end customers. So overall, I have to thank our leadership from back then. They took the bold move to pivot the company at that point, and many people thought we wouldn't make it. And we have succeeded. And things are looking bright for 2023 and onwards.

Shawn Severson: And not to get too deep into the technical side, but it is worth highlighting just what is different about the battery and why you have been able to capture the share you have in material handling. Could you talk about what that industry wanted and needed and what your battery platform has provided to accommodate that?

Raj DasGupta: Yes, so fundamentally, ElectroVaya's platform is our Infinity battery technology.

It's based on a full ceramic separator membrane. By weight, it's 90% ceramic. When you compare that to your standard lithium-ion separators and polymer films, it's very different. It's a brittle material. However, the big difference is that it's stable at high temperatures, which makes those cells much safer.

Combined with our proprietary electrolyte and cell design, you also get that extension on the cycle life. So it's an amazing product. It becomes this relatively high energy density product but can cycle for a very long time without degradation. And you can rely on it not to have any thermal incidents. So because of those attributes, it's a superior technology for these heavy-duty vehicle applications. Material handling is just one of them. But it's the highest duty cycle commercial vehicle that we know of.

Shawn Severson: Let's quickly touch on the solid-state battery platform.

Raj DasGupta: Yes, just touching on that topic, ElectroVaya, to my knowledge, it's the only battery company or lithium-ion battery company that has commercialized ceramic separators to any reasonable degree; it's not an easy thing to do. You have to change your manufacturing processes a bit, it's -- but we are the experts in using ceramic separators.

When you're looking at next-generation solid-state batteries, they are also going to use ceramic separators. And that's something that we are well on our way to developing. Of course, other companies are also looking at this and pouring resources into it. But we do come at this technology with a significant history and know-how in manufacturing and using ceramic separators. So I think that despite our size and being less well funded, we are in a very competitive position for solid-state batteries.

Shawn Severson: Let's conclude with what investors should look to for progress support from the company over the next 12 months. What is the roadmap look like for the next 12 months?

Raj DasGupta: I think it's several things. One would be continuing our deployments and growth concerning deliveries of our battery systems in the material handling sector. So that's number one. And we're well on our way to that.

Number two, of course, is being profitable. That's something that we intend to achieve in the next 12 months. And three would be completing that NASDAQ listing. And then, we want to establish more OEM or strategic relationships with other leading companies.

Shawn Severson: And for investors who may not be familiar with the advantages of an uplisting, it creates a much bigger investment pool and opens up a significant part of the U.S. investor market. And today, with the listing and being the Canadian side, it has made liquidity more of a challenge, but this opens up the playing field.

Raj DasGupta: Totally. The TSX is a great stock exchange but is not very well known for battery technology or technology overall. By moving to the NASDAQ, I think we will be exposed to a much larger investor base. We're going to be better compared to our peers. And I think overall, it will reflect in a stronger valuation, and it'd be good for our investors.

Shawn Severson: Get a great update, Raj. I look forward to having you back. Again, it's great to see the total revenue short-term and the long-term technology roadmap.

Raj DasGupta: Thanks, Shawn. It's great to be back here. Yes, I like to thank all the supporters that we -- ElectroVaya's, had, especially on this latest financing round. The markets have been difficult. It's not easy for people to make these investment decisions and how things are today, and we're grateful for the strong support we've seen.

ABOUT THE ANALYST



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Shawn Severson is President & Co-Founder of Water Tower Research and is a member of the Board of Managers. Prior to co-founding Water Tower Research and previously founding predecessor firm alphaDIRECT Advisors, Shawn spent over 20 years as a senior equity research analyst covering the Technology and ClimateTech sectors, including senior positions at JMP Securities, ThinkEquity, Robert W. Baird (London), and Raymond James.

Shawn started his career as an Equity Research Associate at Kemper Securities. Shawn was frequently ranked as a top research analyst, including one of the Wall Street Journal's "Best on the Street" stock pickers and a StarMine Analyst Awards Top 3 stock picker. Shawn holds a BA in Finance and Economics from Augustana College.

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