AVALON

ADVANCED MATERIALS

Securing Canada's Critical Minerals Future

FALL 2023

EXECUTIVE SUMMARY

On the road to a secure, clean energy economy, Canada must meet a number of challenging milestones. One is the transition to electric vehicles (EVs), a large-scale transformation that is reliant on the development of domestic critical minerals supply chains. To accelerate the energy pivot, both the federal and provincial governments have committed enormous resources to support the construction of lithium-ion EV battery manufacturing facilities in southern Ontario. With several so-called gigafactories now underway, the demand curve for lithium is now clear and enormous.

Yet, one significant problem exists: *Canada, and more specifically Ontario, does not currently produce any battery-grade lithium. The supply curve is thus unclear — which is where Avalon intends to be a significant part of the solution.*

The following whitepaper grapples with this fundamental risk to Canada's clean energy ambitions. While lithium deposits exist in abundance the world over, raw concentrates are unsuitable for use in EV batteries and must first be refined into lithium-hydroxide. Much of the current "midstream" capacity exists halfway around the globe, in China, where the conversion process can lack proper environmental safeguards.

How should Canada contend with these supply chain issues? Are there opportunities for Canadian economic leadership in the energy transition? What role does the private sector play in accelerating change? In this report Avalon answers the questions above, while providing a roadmap to how we intend to help secure Canada's critical minerals future.

Topics covered include:

- ✔ The geostrategic urgency for Canadian critical minerals infrastructure
- ✔ Key frameworks established by federal and provincial ministers
- ✔ How to ensure environmental and sustainability best practices
- ✔ Respecting the rights of Indigenous communities
- ✔ Avalon 2.0's plan for a vertically integrated lithium supply chain

TABLE OF CONTENTS

The amount of carbon dioxide being released daily into the atmosphere is currently at all-time levels. Even as the planet registers its highest temperatures ever recorded, in some places to highs incompatible with human life, emissions are continuing to grow worldwide. Internationally, the imperative to reduce industrial, commercial and household emissions has never been greater, nor the stakes higher. The shift away from carbon requires rapid and vast public and private investment and co-operation.

At the same time, there is a new emerging world order that poses a significant risk to the clean-energy transition. A schism has formed between an increasingly assertive China, which has quietly built a dominant market position in critical minerals, and the West, a widening rift that requires an even faster geo-strategic shift toward domestic onshoring and establishment of domestic critical minerals supply chains that are the foundation of a lower-carbon economy.

The ground is shifting, spurring what is a historic collaboration between governments in Canada, the United States and other Western-aligned countries, and the resource, technology and manufacturing companies that can extract, build and deliver to their citizenry the prosperous, sustainable and secure economies of the future.

The Lower-Carbon Economy Imperative

The energy transition to a lower-carbon economy is undeniably racing ahead. In 2023 alone, $1.7 trillion (U.S.) is being invested by governments and the private sector in clean technologies—$700 billion (U.S.) more than what is being spent on fossil fuels, and by far the most ever injected into clean tech.[1]

"It's astonishing what's happening. Clean energy is moving faster than many people think," Fatih Birol, Executive Director at the International Energy Agency (IEA), said in August.

Yet, there are major obstacles involved in commercializing low-carbon technologies, ranging widely from the political to the technical. Among the most significant is processing enough critical minerals to supply clean technologies at scale, in particular, the minerals required to meet the soaring demand for electric vehicle batteries (EVs).

The world's biggest auto markets, including Canada, are seeing EV sales climb sharply. Electric vehicles are by far the fastest-growing segment of the auto industry, with record sales in the U.S. market of 300,000 in the second quarter of 2023—a 48 percent increase from a year earlier, IEA data show. U.S. federal tax credits have made the least expensive electric vehicles competitive with gas powered cars.

The shift is forcing automakers into a race to secure the components and base materials they will need to maintain rising production levels over the next decade. Among the most important of those materials is battery-grade lithium that will power the world's EV fleets.

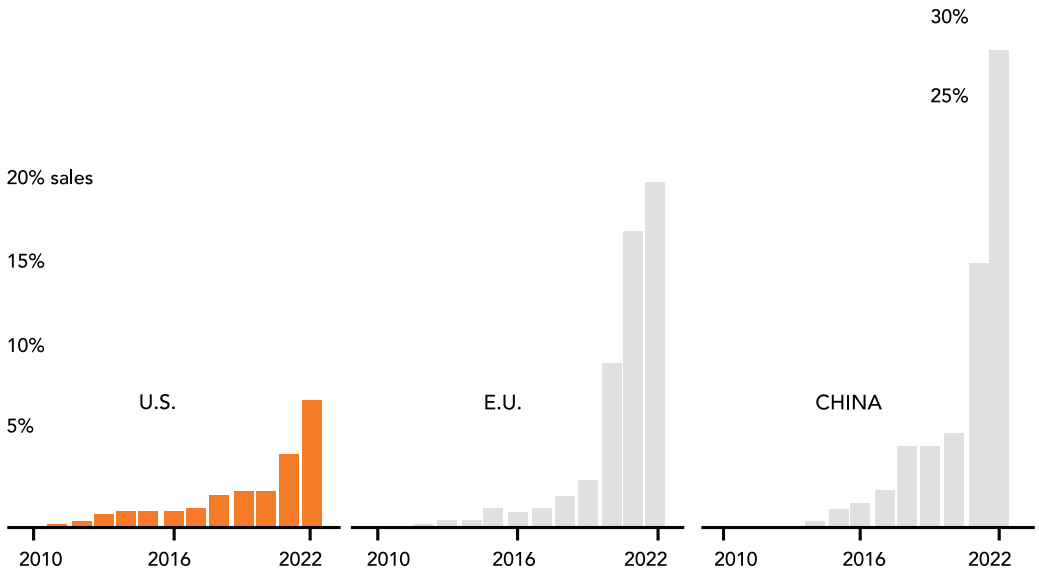
Avalon's Lithium Objective

Global lithium-ion battery revenues are expected to surpass $700 billion (U.S.) a year by 2035, according Benchmark Mineral Intelligence, by which time $730 billion will have been spent on new battery plants, mines and processing facilities to meet the need not just for lithium but for other battery ingredients, including nickel and cobalt. Ensuring that a material percentage of that market runs through Canada is the central mission of Avalon Advanced Materials Inc. (TSX: AVL / OTCQB: AVLNF).

Avalon is a Canadian critical minerals development

Electric Cars are Gaining Momentum

Electric models as percentage of total passenger vehicle sales



Source: International Energy Agency Note: Sales share of battery electric vehicles excludes plug-in

company focused on vertically integrating the Ontario lithium supply chain.

Through its strong portfolio of assets, as well as the planned construction of a leading, sustainable lithium hydroxide processing facility located in the strategic port city of Thunder Bay, Ontario, Avalon is developing the end-to-end solution currently missing between Northern Ontario's considerable lithium resources and Southern Ontario's growing battery manufacturing base—a base that represents a fulcrum in the North American clean-energy economy.

Southern Ontario's EV manufacturing base is expanding rapidly, yet is in significant need of a direct, stable and domestic source of the core ingredient required for EV batteries, lithium hydroxide. Avalon intends to solve that problem for the market, while simultaneously satisfying a primary goal for policymakers.

Our business objectives closely align with the objectives of governments in Ontario, Ottawa and Washington, D.C. Federally, lithium has been prioritized by Canada as a critical mineral that is *a)* essential to national economic security, *b)* has a threatened supply, *c)* is required for the national transition to a low-carbon economy, and *d)* is a sustainable strategic resource for partners and allies.[2]

Of the 31 minerals that qualify for this status, six have been shortlisted as distinct catalysts that can spur economic growth and are foundational for the development of "priority" local supply chains. Lithium is ranked first among the six, presenting the "greatest opportunity to fuel domestic manufacturing" and deliver overall economic benefits.

Avalon's Nechalacho deposit consists of zirconium as well as rare-earth minerals that are also ranked among the six highest-priority critical minerals for domestic development. Lithium extraction and conversion are the company's immediate strategic objectives, however, Nechalacho holds significant potential and is a vital component to Avalon's long-term business plan.

The Canadian Critical Minerals Strategy

In November 2022, the federal Natural Resources Minister, the Honourable Jonathan Wilkinson, as well as the Honourable Francois-Phillippe Champagne, Minister of Innovation, Science and Industry jointly released a comprehensive report on Ottawa's objectives to establish Canada's position as a global leader in the clean-energy transition. The ministers noted that a, "key question on which we must collectively focus is how to build on Canada's comparative advantages in a manner that will create jobs, economic opportunity and prosperity."

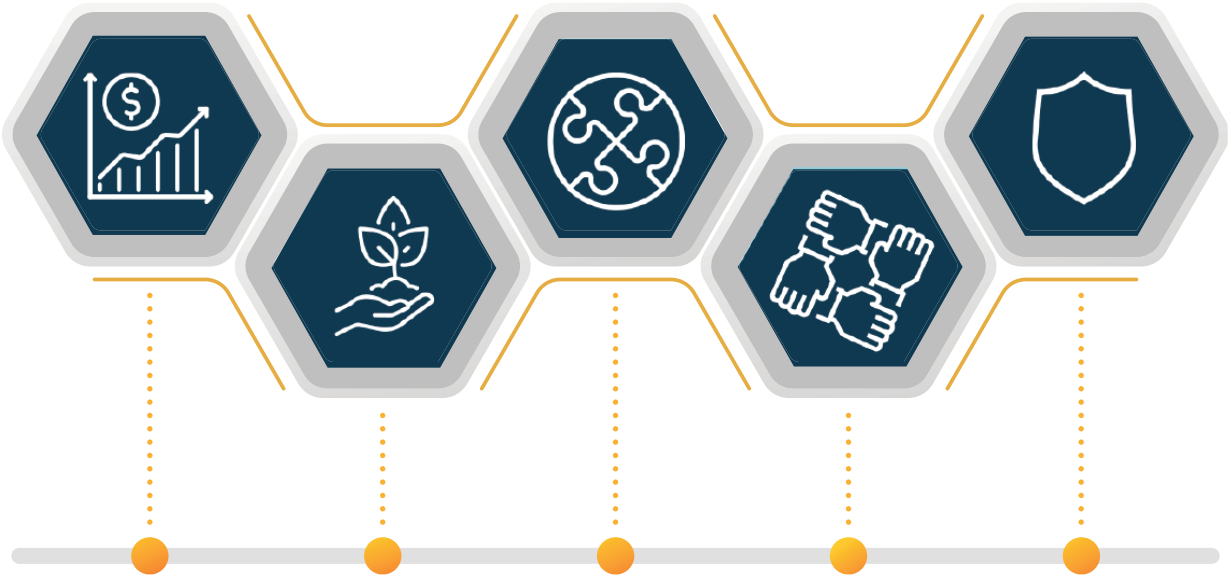
Critical minerals present a, "generational opportunity," the report stated, in areas ranging from exploration, extraction, processing, downstream product manufacturing and recycling. Avalon could not agree more.

This strategy is backed by nearly $4 billion in announced federal funding intended to accelerate projects like the kind Avalon is now undertaking.

By setting, "the stage across the country for job creation, economic growth, the advancement of reconciliation with Indigenous peoples and close cooperation with Canada's allies — all in line with Canadian and international climate and nature protection objectives," the federal government's strategy has provided the private sector with clear guidelines on aligning public and private objectives.

Much of the remainder of this document will outline the five core objectives that Ottawa has laid out in *The Canadian Critical Minerals Strategy*, followed by the means with which Avalon is addressing each of them.

Five Core Objectives



1. Supporting economic growth, competitiveness, and job creation;
2. Promoting climate action and environmental protection;
3. Advancing reconciliation with Indigenous peoples;
4. Fostering diverse and inclusive workforces and communities; and
5. Enhancing global security and partnerships with allies

Source: The Canadian Critical Minerals Strategy, Nov. 2022

It should also be noted that provincial governments, like Ontario, as well as various U.S. government agencies, including the Departments of Defense and Energy, as well as the United States federal government, share many if not all of the strategic objectives that the Canadian federal strategy has identified.

But first, a more fulsome introduction to Avalon, our history and the strategic vision we are executing on over the near- and medium-term time horizons.

Meet Avalon 2.0

Avalon Advanced Materials has a well established history in the Canadian critical minerals industry, having amassed over the past two and half decades a leading portfolio of lithium, zirconium and rare earth deposits in Ontario, the Northwest Territories and other regions.

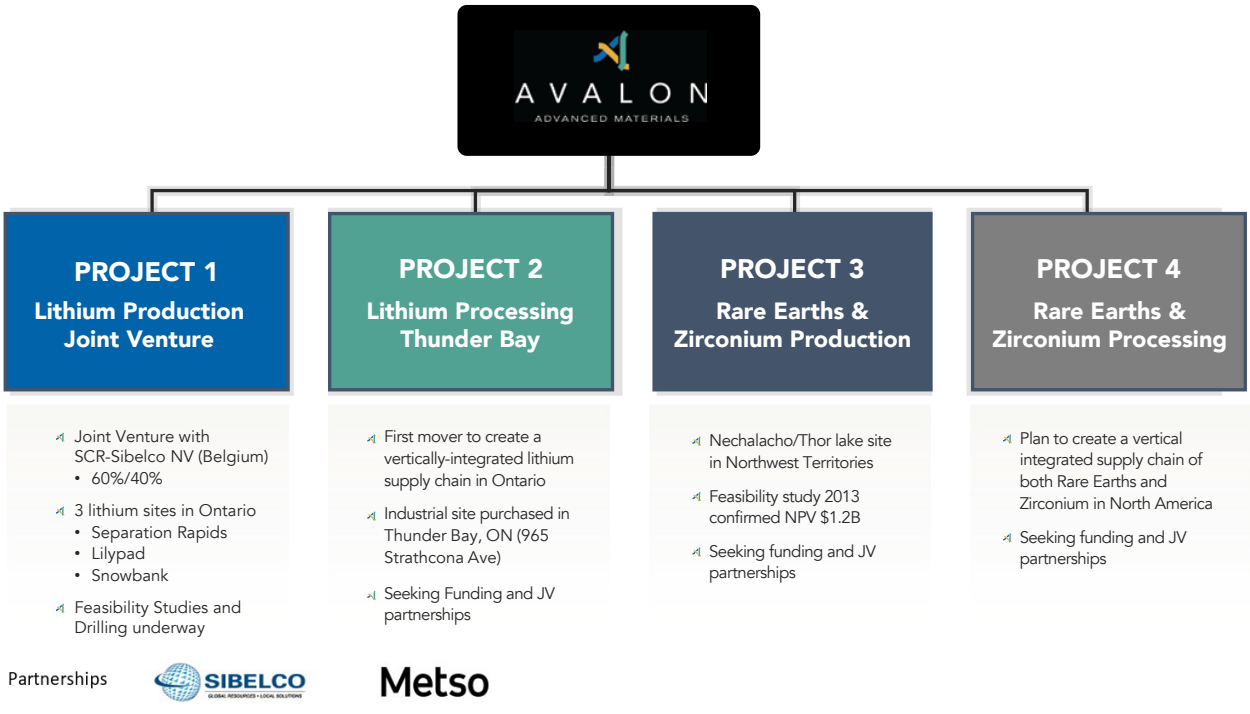
Under its founding management, Avalon existed for many years the same way other junior Canadian miners have, discovering deposits in the hopes of one day bringing projects into production.

Commencing with the appointment of several new executives[3], led by new CEO Scott Monteith, a new executive team and refreshed board of directors have ushered in a new era we are calling "Avalon 2.0."

With a new management team that possesses deep expertise in resource development and capital markets, Avalon 2.0 is laser focused on commercializing its assets and maximizing its market potential as the need for lithium and Avalon's other critical minerals is growing exponentially.

Avalon has four principal projects at various stages of development. Projects 1 and 2 are of the most immediate focus. The lynchpin to Avalon 2.0's strategic vision is the planned construction of an US$800 million lithium hydroxide conversion facility at the strategically located port city of Thunder Bay, ON.

Current Projects



The company's new executive team has moved quickly to put the pieces in place that will see Avalon develop the facility and complete Ontario's first vertically integrated supply chain for battery-grade lithium, servicing the North American EV market.

Project 1: Lithium Mining (Avalon-Sibelco JV Partnership)

On June 13, 2023 Avalon signed a $63-million joint venture agreement (JV) with SCR-Sibelco NV, a Belgium-based global leader in materials solutions and glass ceramics.[4] The agreement creates a new JV Company, Separation Rapids Ltd ("SRL"), which will be owned by Sibelco (60%) and Avalon (40%), and operate the flagship lithium deposit at Separation Rapids and Snowbanks Project near Kenora, ON., as well as own the Lilypad Project near Fort Hope, ON. SRL has a mandate to extract and commercialize its mineral assets.

Headquartered in Antwerp, Belgium, Sibelco has mineral production facilities in more than 30 countries. The company mines, processes and sells specialty industrial minerals and is a leader in glass recycling. Sibelco's solutions serve a diverse range of industries including semi-conductors, solar photovoltaic, glass, ceramics, construction, coatings, polymers and water purification.

Separation Rapids, located 70 kilometres north of Kenora, ON., is SRL's flagship deposit and is the closest to production, with a target date of Q1 2026 for active extraction activity to commence. It offers a rich deposit of petalite, which through the use of Metso technologies, can economically yield EV battery-grade lithium at scale.

On August 10, 2023, Avalon released an updated Mineral Resource Estimate (MRE) for Separation Rapids, conducted by SLR Consulting (Canada) Ltd., an independent global mining advisory and consulting firm. The MRE confirmed what initial drilling had suggested, revealing a measured and indicated deposit that is 20% larger than earlier estimates. This MRE, compliant with NI 43-101, showed 10.08 million tonnes (Mt) of petalite, with a Lithium Oxide ("Li2O") grade that averages 1.35%.[5] The latest MRE also indicated a further 3-6 Mt of exploration potential resource that a drilling program commenced on September 26, 2023 will seek to confirm. The program is expected to be completed by February 2024.

Scott Monteith, Avalon's CEO, said at the time: "This updated estimate reveals the quality and quantity of the resource at Separation Rapids, and underscores the rationale for the strategic partnership between Avalon and Sibelco. It confirms that the deposit can deliver sufficient volumes of commercial-grade feedstock suitable for both the glass-ceramics and lithium battery markets.

"This data gives Avalon and Sibelco the confidence to pursue the next phase of development at Separation Rapids, finalizing a definitive feasibility study and moving towards production."

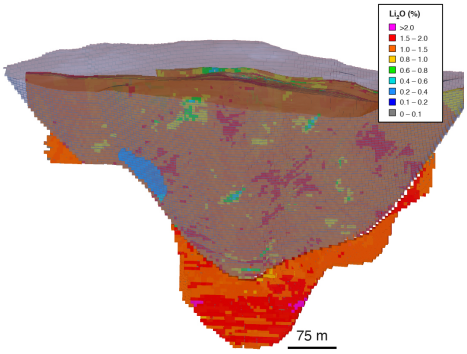
Extraction activities at Separation Rapids are being capitalized through the Avalon-Sibelco joint venture, with the goal of commencing operations in the first quarter of 2026. Sibelco has the sole funding responsibility for the first $50 million of joint venture expenses.

As part of the terms of the JV agreement, a portion of the petalite feedstock will be used for Sibelco's glass ceramics business, while the cash flows generated from the sale of petalite will aid in the capitalization of Avalon's Strathcona conversion facility in Thunder Bay. Estimated pro forma gross revenues from mining operations at Separation Rapids are expected to be ~$275 million per annum, based on prevailing spot market prices.[6]

Mineral Resource Estimate, August 4, 2023

	Classification	Tonnage (Mt)	Li_2O (%)
Open Pit	Measured	4.28	1.33
	Indicated	5.12	1.35
	Measured + Indicated	9.39	1.34
	Inferred	1.60	1.34
Underground	Measured	-	-
	Indicated	0.68	1.43
	Measured + Indicated	0.68	1.43
	Inferred	1.21	1.42
Total	Measured	4.28	1.33
	Indicated	5.80	1.36
	Measured + Indicated	10.08	1.35
	Inferred	2.81	1.38

See Appendix A



Project 2: Lithium Processing (Metso collaboration)

The negotiations with Sibelco were occurring at the same time Avalon was securing the purchase of industrial land in Thunder Bay, which was finalized on June 16, 2023.[7] With access to cargo shipping via a deep-water port, rail and road access, as well as active power, gas, water and sewer lines, the 383-acre property at 965 Strathcona Avenue provides both an ideal geographic location along with the required infrastructure to host Avalon's full-service lithium hydroxide conversion facility.

Avalon has also entered a partnership with Metso Corp. to engage on the technical development of the Strathcona site, as well as to leverage Metso's groundbreaking, sustainable processing technologies in the production of lithium hydroxide using petalite ore, the principal feedstock located at Separation Rapids.[8]

Headquartered in Helsinki, Finland, Metso is a leader in providing sustainable technologies, end-to-end solutions and services for the aggregates, minerals processing and metals refining industries globally. The Finnish firm employs over 16,000 people in close to 50 countries with sales in 2022 of EUR 5.3 billion. The company is listed on the Nasdaq Helsinki.

Avalon's other lithium projects are in early-stage development, but hold similar comparable market potential to Separation Rapids. Snowbank, located near Separation Rapids, is a second petalite-lithium deposit currently in the exploration phase, with a new drilling program planned for early 2024. The Lilypad Project is another potential Li2O spodumene-lithium deposit currently in exploration phase.

Projects 3 & 4: Zirconium Mining and Processing

The Nechalacho site in the Northwest Territories consists of a large-scale deposit of zirconium and rare earth critical minerals vital for advanced technologies in a range of sensitive sectors, including the nuclear and defense industries. The deposits hold enormous potential for value creation as well as in nurturing a domestic North American supply chain for geostrategic materials vital to national security. Nechalacho is a longer-term strategic focus Avalon sees significant value in developing.

We'll return now, however, to the core objectives identified by the *Canadian Critical Minerals Strategy,* using them as sign posts to inform an understanding of how Avalon's commercial interests align closely to public policy objectives, while also serving as part roadmap for investors to understand the economic and financial considerations being pursued by the Avalon 2.0 strategy.

Deposit Assets (lithium, zirconium and rare earths)

1. Supporting Economic Growth, Competitiveness, Job Creation

First and foremost, among the five pillars identified by the Hons. Ministers Wilkinson and Champagne is the pursuit of economic opportunities, jobs and the overall strengthening of Canada's economic competitiveness.

"We will incentivize new connections and linkages across Canada's upstream and downstream critical minerals value chains, allowing us to build a strong critical minerals ecosystem," were the words used by Minister Champagne. Those incentives are intended to, "cement Canada's position as a leader in the low-carbon economy. Together, we must be bold, we must be ambitious, and we must seize the moment."

Though there is more work to be done, Avalon is doing just that.

The direct economic benefits from the development of Separation Rapids as well as Avalon's lithium hydroxide conversion facility are estimated to exceed $1 billion in annual revenue.6 More than 500 direct, long-term fulltime jobs are expected to be created between both the Kenora and Thunder Bay locations.

Yet the second-order economic benefits that will be generated are myriad and potentially immense. According to the IEA, by 2030 an estimated 220,000 North American jobs will be created by the zero-emissions vehicle market in mining, processing and manufacturing.[9]

Ontario's 'Rockefeller' Strategy

The end-to-end vertically integrated lithium supply chain Avalon is developing for the Ontario market would greatly help germinate commercial enterprises and growth in all of those subsectors—mining, processing, manufacturing and battery recycling.

The Avalon processing conversion facility would serve as

a regional hub not merely for our own lithium feedstocks, but for other Ontario and Canadian producers, while attracting the necessary capital needed to bring other domestic lithium deposits into production.

Following a comprehensive strategic review that commenced in 2022, the Avalon 2.0 team has pursued what we are calling our 'Rockefeller Strategy'—an homage to John D. Rockefeller's pursuit of refineries and the creation of a vertically integrated U.S. supply chain for oil in the mid-1800s.

Rockefeller's strategy enabled the United States to become an early global leader in the oil-and-gas sector, which would yield immeasurable economic value-add and innovation over the remainder of the nineteenth century and well into the twentieth. Today, the United States remains the world's largest energy refiner—a testament to Rockefeller's vision more than 150 years ago.

Avalon's twenty-first century Rockefeller strategy is to use the Thunder Bay industrial site to co-locate the conversion, recycling and cell manufacturing of Northern Ontario's lithium deposits into one vertically integrated supply chain that will reliably service the EV battery manufacturing base of Southern Ontario and beyond.

The objective is to ship lithium feedstock sourced from Separation Rapids and other Avalon extraction operations, as well as from other regional intake agreements with non-Avalon mining operators, to our lithium conversion facility in Thunder Bay. From there, LiOH will be processed on site at Strathcona, and manufactured into battery-ready materials. The manufactured materials will then be shipped by rail, ship or road to battery manufacturing plants in southern Ontario and elsewhere.

Thunder Bay Lithium Industrial Parkway

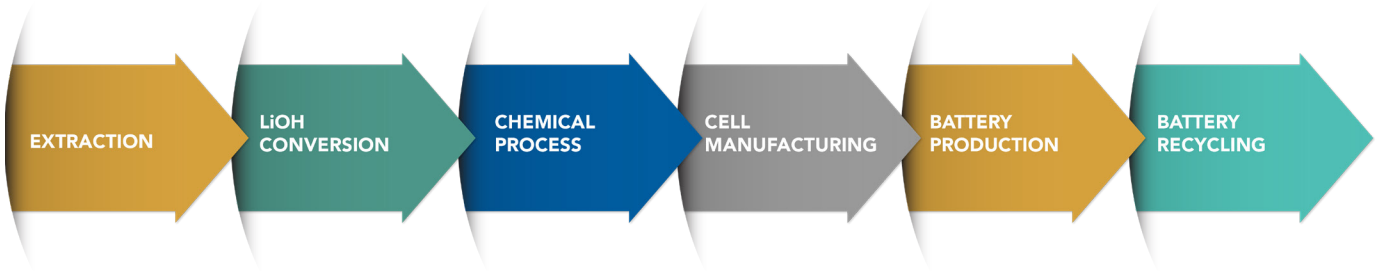
It is Avalon's view that the Rockefeller strategy we are pursuing for Thunder Bay is the end-to-end solution that will cement Ontario's leading position in an interconnected North American EV market place.

Sources of Funding

The Strathcona facility will require total capex of ~US$800 million, of which approximately 25% is intended to come from strategic partnerships between Avalon and potential OEMs, manufacturers and financial investors we have engaged.

The remaining funding is expected come from U.S. and Canadian government grants and loans, such as Canada's Strategic Innovation Fund (SIF), Invest Ontario, the U.S. Bipartisan Infrastructure Law (BIL) and the Defense Production Act.

Avalon is currently in discussions with the U.S. Departments of Defense and Energy, respectively, as



Key Figures

20 Years Assumed Hydroxide Operation	**US $809M CAPEX***	**US $13,952 Operating Cost/Tonne****
20,000 tpa (petalite) 30,000 tpa (spodumene) lithium hydroxide monohydrate production capacity	**US $1.43B Post Tax NPV8% US $15.08B Revenue**	**US $15.08B Revenue over project life**
US $26,000 / Tonne Lithium Hydroxide Price assumption	**24.2% Post Tax IRR***	**US $168.3M (petalite) US $369.5M (spodumene) Annual EBIDTA**

this assumes no government grants or credits and all figures to be further refined
*based on Piedmont Lithium FS
**based on Piedmont Lithium OPEX in FS

well as with the federal governments of Canada and the United States to secure funding for the facility, which has a targeted operating date of 2028.

2. Promoting Climate Action and Environmental Protection

The Canadian Critical Minerals Strategy also makes clear that in addition to the creation of resilient critical minerals supply chains in Canada, they must adhere to the highest ESG standards.

Avalon is bringing to bear both the internal resources to ensure its operations meet a high bar of sustainability — of which it already has a long and established track record — but also through strategic partnerships that leverage the industrial expertise of world leading partners in sustainable critical-minerals development that produce minimal environmental impacts.

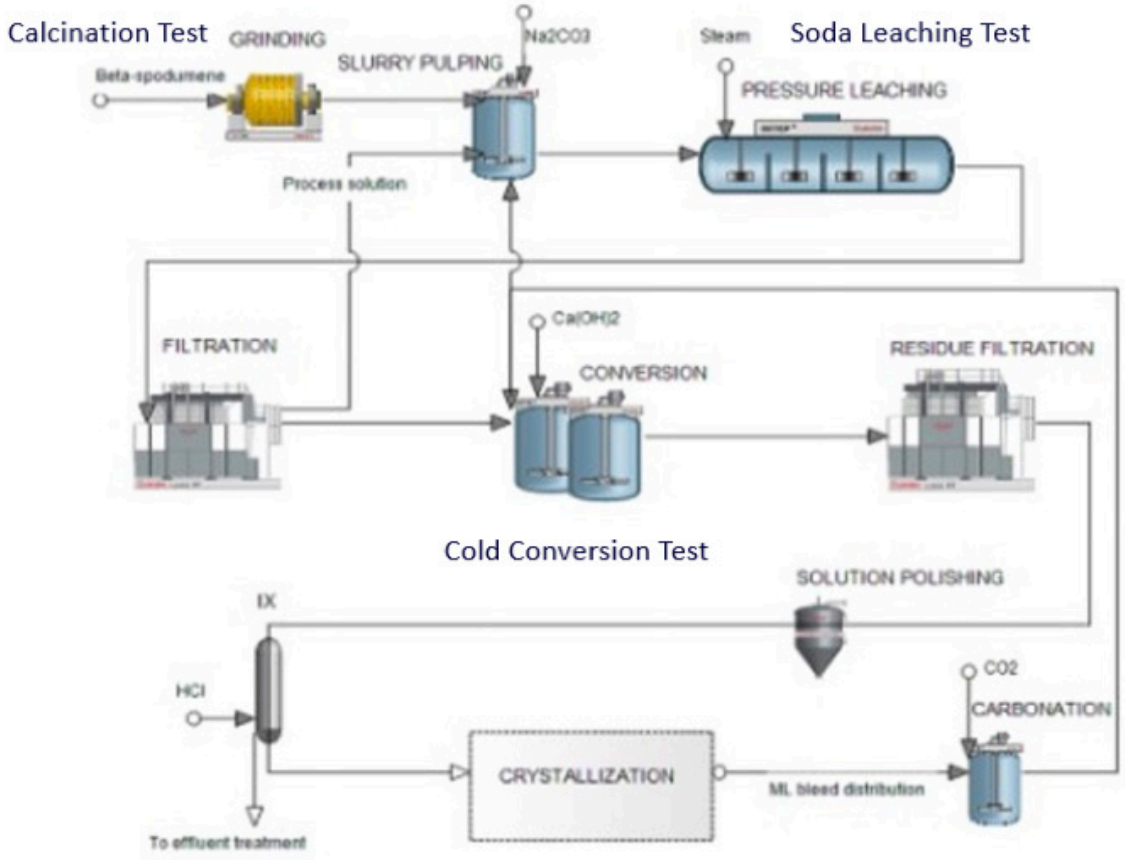
At Separation Rapids, the expertise in responsible resource management provided by the Sibelco partnership cannot be overstated. With Sibelco's deep knowledge regarding best-in-class sustainable mining methods, the learning curve regarding impacts to the local environment will be minimal—a crucial factor in Avalon's commitments to the Wabaseemoong Independent Nations community, a key rights holder in the project.

Metso's refining platform (see Figure 1) which Avalon will be leveraging in Thunder Bay also adheres to strong ESG commitments, and represents a far cleaner methodology for lithium hydroxide production compared to conventional methods used in jurisdictions with much less stringent environmental considerations, such a China.

Metso is a leader in providing sustainable technologies, end-to-end solutions and services for the aggregates, minerals processing and metals refining industries globally. The company's process and product expertise can boost productivity, improve energy and water-use efficiency and raise the overall environmental performance of the Thunder Bay facility.

For battery minerals in particular, Metso provides sustainable technology and equipment for the entire production chain, from the mine to battery materials and black mass recycling with project scopes ranging from equipment packages to plant deliveries.

Figure 1. New Metso Lithium Conversion Process



Critical to Avalon's commitment to sustainability is the lithium hydroxide (LiOH) conversion process we will use, which outputs an inert material rather than the highly pollutive sulphuric discharge of conventional processing methodologies used within current refining supply chains. Moreover, instead of presenting the environmental challenge of disposing of that discharge, the inert matter the Avalon-Metso process will produce can be used as a commercial material with applications in the construction industry.

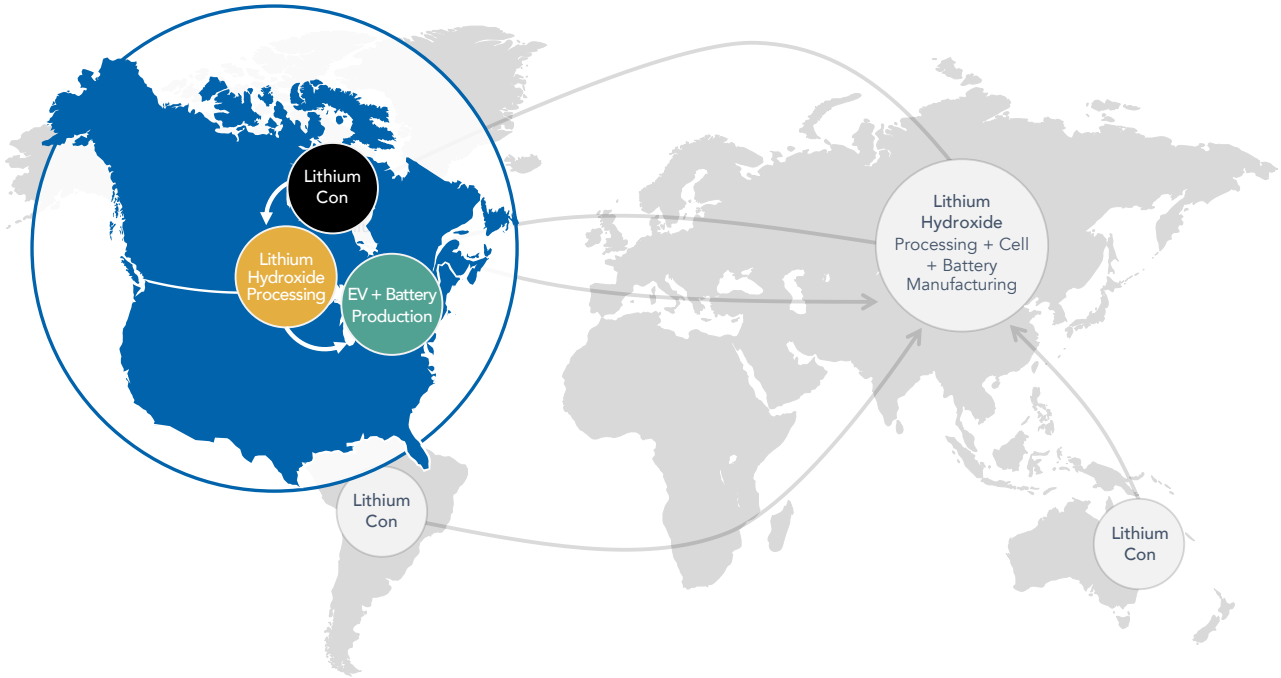
At a broad level, Avalon's business objectives aim to achieve a dramatic cut in CO2 emissions by the simple act of onshoring lithium hydroxide conversion. At present, more than two-thirds of lithium refining occurs in just one country: China.[10] The Avalon supply chain will replace the current system of shipping raw feedstock to Chinese refineries, then shipping processed LiOH to battery manufacturers, with a much more geographically condensed—and geopolitically secure—Ontario based solution.

Avalon's track record of supporting sustainability efforts is evidenced by more than a decade of detailed reporting in our annual sustainability reports, which have been produced every year since 2011. Now, with a new global framework for sustainability- and climate-related financial disclosures moving closer to being adopted at the country level, Avalon is taking proactive steps to implement the ISSB protocols into our ongoing sustainability reporting.

For companies located in Canada, there is currently no mandatory requirement to comply with the ISSB

Onshoring Lithium Supply Chains

To Replace China-Centric Model



Standards. However, the Government of Canada, as well as various regulatory and professional agencies, have voiced support for the ISSB and the movement towards standardized and mandatory climate-related financial disclosures[11], which we are prepared to support.

3. Advancing Reconciliation with Indigenous Peoples

The success of Avalon's critical minerals development is tied to the active participation of Indigenous peoples, which is achieved by integrating diverse Indigenous perspectives through ongoing engagement, collaboration and benefit-sharing. As the *Canadian Critical Minerals Strategy* notes: "Indigenous peoples are the stewards, rights holders, and in many cases, title holders to the land upon which mineral resources are located. Historically, Indigenous peoples have not always benefited from natural resource development on their traditional territories, and some developments have caused adverse environmental and social impacts on communities."

Avalon has a long track record of engagement with Indigenous communities within whose traditional territory it works. Our efforts have been recognized by the Prospectors and Developers Association of Canada (PDAC) with a Distinguished Service Award. Avalon's ongoing work has culminated in several Memoranda of Understanding (MOUs) or other formal agreements with various communities, including Wabeseemoong Independent Nations, The Northwest Territory Métis nation, The North Slave Métis Alliance, the Dene Kue First Nation and the Chapleau First Nation.

Avalon seeks to be a proactive partner with the Indigenous

communities within whose traditional territories we work. As a key early step, the Avalon 2.0 management team recently completed the *San'Yas Anti-Racism Indigenous Cultural Safety Training Program* (Ontario) and received certification. Further, Avalon has developed and published its first Land Acknowledgment that reads as follows;

"Avalon Advanced Materials Inc. acknowledges that our work takes place within the ancestral and traditional territories of First Nations, and Métis people. We respect Indigenous rights and are committed to deepening our existing relationships while forging new lasting ties which will ensure that we and future generations benefit from the positive social and economic opportunities related to our operations."

Avalon is keenly aware of our responsibilities to the Indigenous peoples and others within the boundaries of its present and future operations, responsibilities identified under the *United Nations Declaration on the Rights of Indigenous Peoples Act*, which came into force on June 21, 2021. The Act provides a clear vision for the future to ensure that federal laws reflect the standards set out in the Declaration, while also respecting Aboriginal and Treaty rights recognized and affirmed in the Constitution. and seeking to secure free, prior, and informed consent for natural resource projects, including critical mineral development.

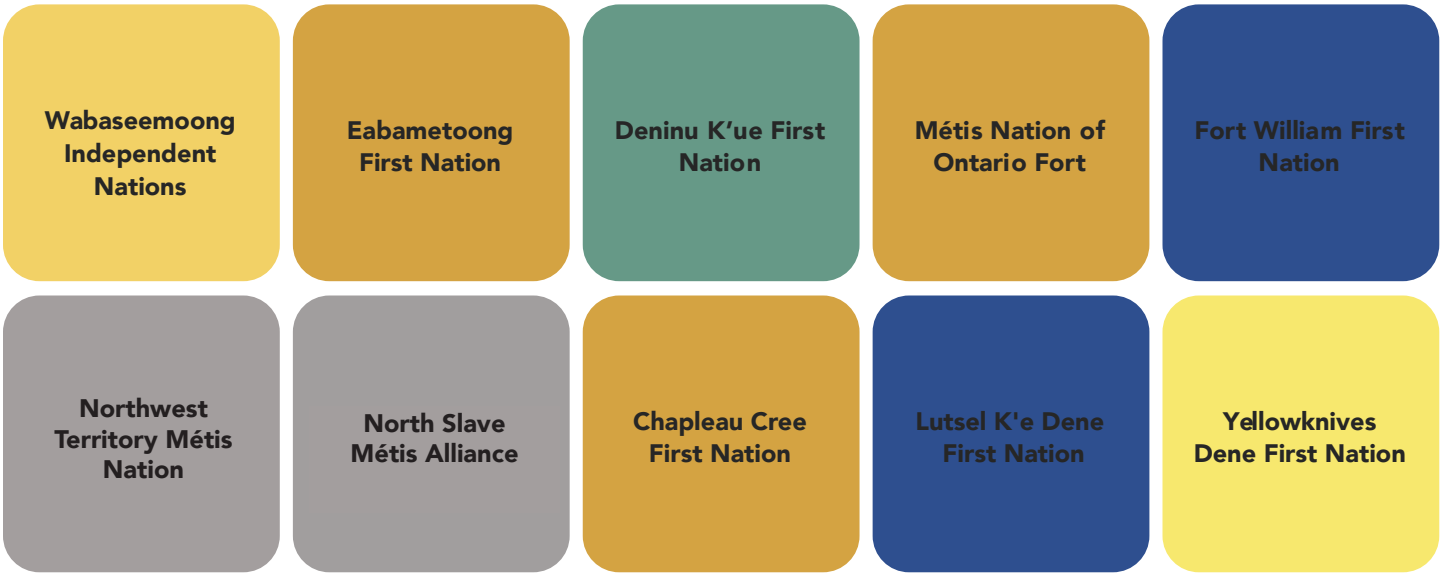
4. Fostering Diverse and Inclusive Workforces and Communities

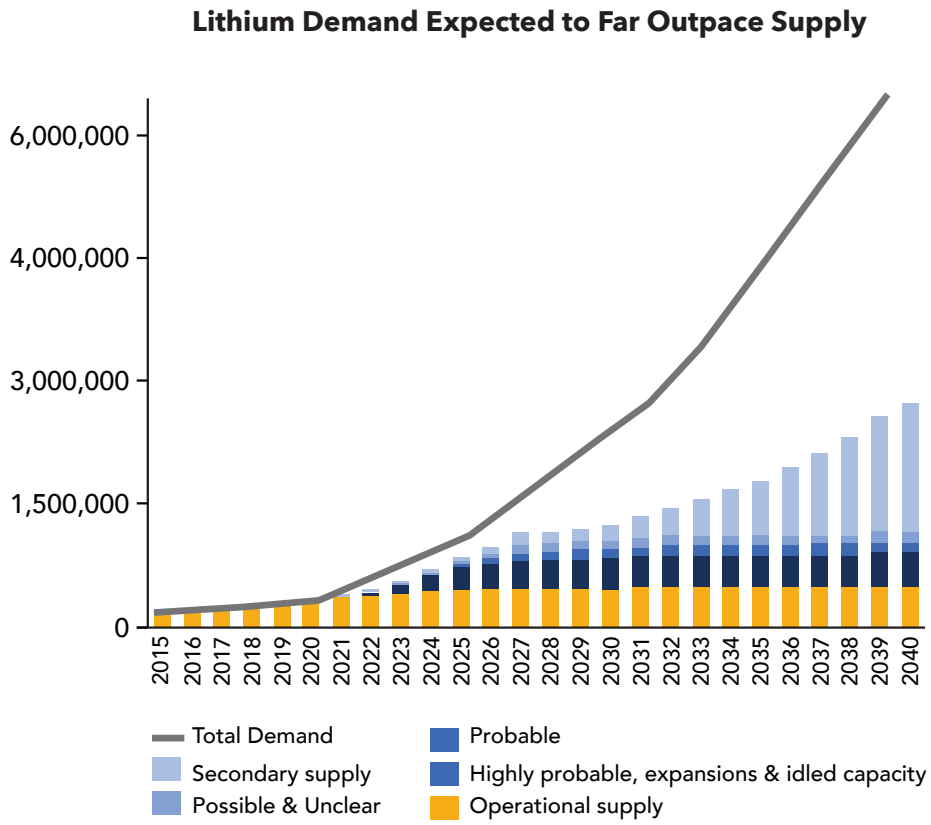
A fourth core objective outlined by the *Canadian Critical Minerals Strategy* is the fostering of diverse and inclusive workforces and communities, which we view as both an ESG and economic mandate, respectively.

Strengthening critical minerals supply while promoting innovation and sustainable practices across critical minerals value chains are the core goals outlined by Ministers Wilkinson and Champagne, but this must be

Consultation with Indigenous Communities

Avalon has a diverse community of Indigenous relationships across its projects





done "in way that supports regional economic growth; creates a more inclusive and highly skilled workforce; and upholds and strengthens our leading environmental, social and governance standards."

Avalon aims to create hundreds of direct, and many more indirect jobs in communities across the country, while putting ESG values front and centre—an imperative for not merely people, but the planet.

5. Enhancing Global Security and Partnerships with Allies

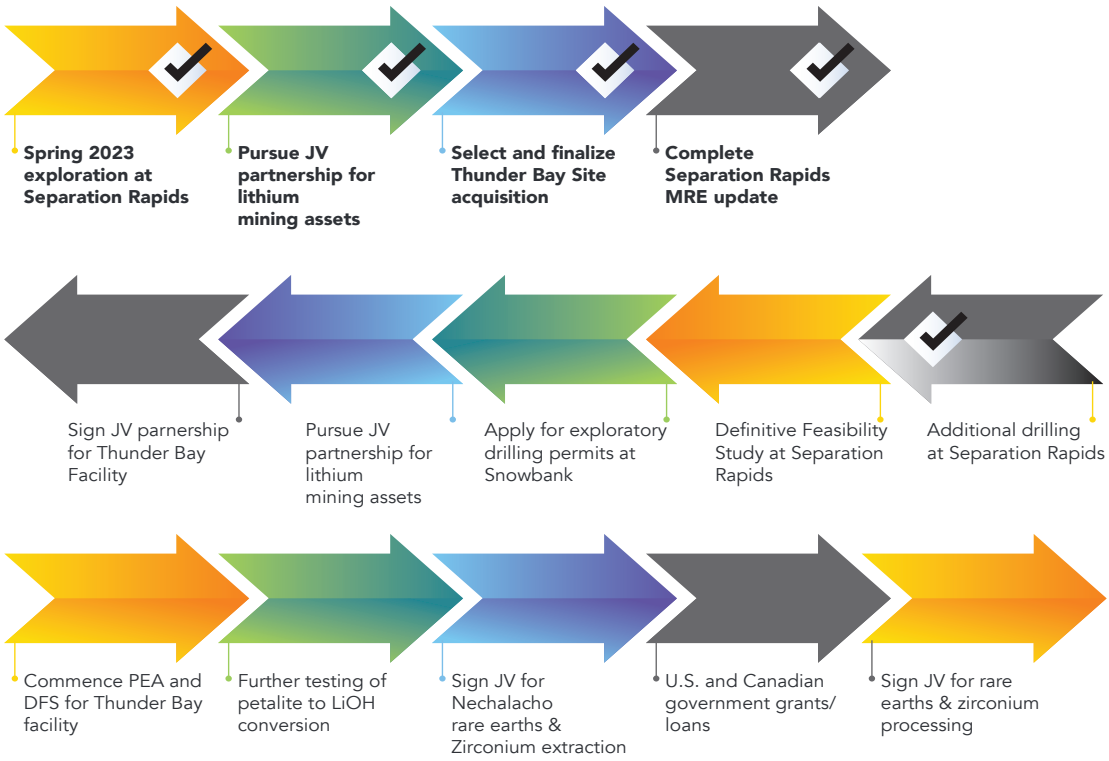
"Canada's European allies have recently experienced the consequences of dependence upon non-like-minded countries for strategic commodities such as oil and gas, and there is a strong desire to avoid similar vulnerabilities in emerging markets such as critical minerals." – Hon. Jonathan Wilkinson, Minister of Natural Resources

"Canada's leadership in this space has never been more important. The fragility of global supply chains is motivating governments and companies around the world to assess their supply chain resilience for commodities and manufactured goods. It is increasingly clear that Canada can—and will—be the solution." – Hon. Francois-Phillippe Champagne, Minister of Innovation, Science and Industry

Allow us to add some additional voices to the discussion: "By not having control… we will have a lot of difficulty in the near future, in a world where you can't be sure who will be your friend and deliver things tomorrow." – Prof. Dirk Uwe Sauer, RWTH Aachen University, Germany[12]

"You're talking about building infrastructure for an industry that needs to grow 10 times in the next few years. While a battery is just a storage device, it's a critical component of the energy transition. These things are considered items of national security now. You don't want to be reliant on another country." – Michael Finelli, President, Solvay[13]

Avalon 2.0 Milestones



Avalon's response to these comments is contained within our corporate mantra: "Securing Canada's Critical Minerals Future."

With over 66% of global lithium hydroxide processing capacity, China holds an unrivalled position in the current global market place. That is changing quickly, as various governments scramble to ensure their economies can compete in the clean-technology economy. There will be new winners and there will be losers.

Our aim is to ensure Canada wins, by building a cornerstone continental platform in Ontario that provides a stable supply of battery-grade LiOH to an expanding Canadian and North American battery manufacturing base.

This commercial marketplace is developing against a backdrop of geo-strategic positioning between countries, led by the power struggle emerging between China and the United States. The U.S. Departments of Energy, Defense and State recently signed a memorandum that will see processed lithium and rare-earth minerals stockpiled in the interest of national security.

By 2025, U.S. companies are expected to be banned from sourcing critical minerals from "foreign entities of concern" (FEOC), of which China has been identified. If "Fortress North America" is a path being pursued by policymakers, Avalon, as a Toronto domiciled company with production and processing located in Ontario, stands to benefit. Avalon presents no geopolitical risk, and is seen by U.S. policy makers largely as a domestic supplier to the North American supply chain.

Next Steps

These developments are occurring as commercial demand for lithium skyrockets, predominantly due to the fast-growing EV market, but also the emerging consumer battery storage industry.

At current production and processing levels, demand is expected to vastly outstrip supply in the years to come.[14]

Automakers can see the writing on the wall, and are moving quickly to position themselves in the North American EV market. In an unusual move, seven manufacturers — BMW Group, General Motors, Honda, Hyundai, Kia, Mercedes-Benz Group and Stellantis — are spending US$1 billion in a joint venture to build 30,000 charging ports on major highways and other locations in the United States and Canada.[9]

It's a "once-in-a-generation inflection point," Mary Barra, G.M.'s CEO, told the New York Times in August.

Avalon has also moved at speed—under our "Avalon 2.0" mandate—to actualize on our strategic objectives. Many of our core priorities for 2023 have been met, and we are now moving to a new phase in Avalon's corporate development. Avalon is an unwavering believer in productive partnerships with companies and stakeholders who share the same values, and will seek to further execute on a business plan we see as creating tremendous economic value at the national, provincial and community levels, while facilitating the clean-energy transition.

Our operational goals in the near- and medium-term are economically accretive to financial and strategic partners and investors, and are directly aligned with the imperative of securing Canada's critical minerals future.

Appendix

Appendix A – Separation Rapids, Mineral Resources Estimate, Aug. 7, 2023:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported using a petalite concentrate price assumption of US $1,300/t with an exchange rate of US$1 = C$1.30.
3. Open pit Mineral Resources are reported at a 0.29 % Li2O cut-off grade (COG) in a Whittle resource shell. The Whittle resource shell and open pit COG grade are based on a mining cost of C$5.50/t, general and administration cost of C$3.50/t, a processing cost of C$55.00/t, and a recovery of 50%.
4. Underground Mineral Resources are reported within Deswik resource panels which were generated using a breakeven 0.9 % Li2O COG. The underground breakeven COG grade is based on a mining cost of C$120/t, general and administration cost of C$3.50/t a processing cost of C$55.00/t, a recovery of 50%, and an exchange rate of US$1 = C$1.30. The Deswik resource panels are 5 m by 5 m by 3 m wide.
5. Mineral resources are reported based on a minimum thickness of approximately 3 m.
6. Average bulk densities were assigned to the blocks and range between 2.61 t/m3 and 2.66 t/m3 for the lithium pegmatite.
7. Numbers may not add due to rounding.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Footnotes

[1] International Energy Agency, Aug. 2023 est.
[2] The *Canadian Critical Minerals Strategy*. November, 2022
[3] Avalon Overhauls Leadership Team to Compete in Global Lithium Race, June 12, 2023
[4] Avalon Announces C$63M Strategic Investment by Sibelco to Create a Vertically Integrated Lithium Strategic Partnership in Ontario, June 15, 2023
[5] Avalon announces a substantive 20% increase in deposit size at its flagship Separation Rapids joint-venture lithium project, Aug. 10, 2023
[6] Financial estimates are internal, unaudited pro-forma projections and are subject to change.
[7] Avalon Completes Purchase of Industrial Site in Thunder Bay as Key Next Step in Becoming Ontario's First Vertically Integrated Lithium Producer, June 19, 2023
[8] Avalon Signs MOU with Metso, a World Leader in Critical Minerals Technology, to Advance the Development of Ontario's First Lithium Processing Facility, July 10, 2023
[9] "The Clean Energy Future Is Arriving Faster Than You think," The New York Times, Aug. 12, 2023
[10] "The World Can't Wean Itself Off Chinese Lithium," Wired Magazine, June 30, 2022.
[11] "To ISSB or Not to ISSB, that is the Question," Fasken, June, 29, 2023
[12] "Rival battery technologies race to dominate electric car market," Financial Times, Aug. 14, 2023
[13] "The Clean Energy Future Is Arriving Faster Than You think," The New York Times, Aug. 12, 2023
[14] Benchmark Minerals Intelligence, 2023

Forward-Looking Information

This report presentation contains "forward-looking information" within the meaning of applicable Canadian securities legislation. Forward-looking information includes, but is not limited to, information with respect to Avalon Advanced Materials Inc's. ("Avalon or the "Company") mineral resource estimates, the potential expansion of mineral resource estimates, the potential for the economics of the Company's material lithium projects to improve, the development of the Company's material lithium projects, the advancement of projects towards a development decision, the Company's plans with respect to the exploration and development of its properties, the continued exploration and drilling initiatives and having the necessary funding required to complete these initiatives, the prospectivity of exploration targets, costs of production, expected capital expenditures, operations outlook, expected benefits from the joint venture with SCR-Sibelco NV ("Sibelco"), the expected receipt of permits; permitting timelines, the future price of commodities, foreign exchange rates and currency fluctuations, requirements for additional capital, the Company's capital allocation; the estimation of mineral reserves and mineral resources; the realization of mineral reserve and mineral resource estimates, obligations to consult with indigenous communities, and government regulation of mining operations. Generally, forward-looking information can be identified by the use of forward-looking terminology such as "add" or "additional", "advancing", "anticipates" or "does not anticipate", "appears", "believes", "can be", "conceptual", "confidence", "continue", "convert" or "conversion", "deliver", "demonstrating", "estimates", "encouraging", "expand" or "expanding" or "expansion", "expect" or "expectations", "forecasts", "forward", "goal", "improves", "increase", "intends", "justification", "plans", "potential" or "potentially", "promise", "prospective", "prioritize", "reflects", "robust", "scheduled", "suggesting", "support", "top-tier", "updating", "upside", "will be" or "will consider", "work towards", or variations of such words and phrases or state that certain actions, events or results "may", "could", "would", "might", or "will be taken", "occur", or "be achieved".

Forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of activity, performance or achievements of the Company to be materially different from those expressed or implied by such forward-looking information, including risks associated with mineral exploration and development operations such as: environmental hazards and economic factors as they affect the cost and success of the Company's capital expenditures, the ability of the Company to obtain required permits and approvals, the ability of the Company to obtain financing, uncertainty in the estimation of mineral resources, the price of lithium, no operating history, no operating revenue and negative cash flow, land title risk, the market price of the Company's securities, the economic feasibility of the Company's mineral resources and the Company's commercial viability, inflation and uncertain global economic conditions, uncertain geo-political shifts and risks, successful collaboration with indigenous communities, future pandemics and other health crises, dependence on management and other highly skilled personnel, title to the Company's mineral properties, the ongoing war in Ukraine, extensive government and environmental regulation, reliance on artificial intelligence technology to influence mining operations, volatility in the financial markets, uninsured risks, climate change, threat of legal proceedings, as well as those risk factors discussed or referred to in the annual information form of the Company dated November 28, 2022 (the "AIF") under the heading "Description of the Business – Risk Factors". Forward-looking information is based on the reasonable assumptions, estimates, analysis and opinions of management made in light of its experience and perception of trends, current conditions and expected developments, as well as other factors that management believes to be relevant and reasonable in the circumstances at the date that such statements are made, but which may prove to be incorrect. Although the Company believes that the assumptions and expectations reflected in such forward-looking information are reasonable, undue reliance should not be placed on forward-looking information because the Company can give no assurance that such expectations will prove to be correct. In addition to other factors and assumptions identified in the AIF, assumptions have been made regarding, among other things: management of certain of the Company's assets by other companies or joint venture partners, the Company's ability to carry on its exploration and development activities without undue delays or unbudgeted costs, the ability of the Company to obtain sufficient qualified personnel, equipment and services in a timely and cost-effective manner, the ability of the Company to operate in a safe, efficient and effective manner, the ability of the Company to obtain all necessary financing on acceptable terms and when needed, the accuracy of the Company's resource estimates and geological, operational and price assumptions on which these are based and the continuance of the regulatory framework regarding environmental manners. Readers are cautioned that the foregoing list is not exhaustive of all factors and assumptions that may have been used. Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking information, there may be other factors that cause results not to be as anticipated, estimated or intended. There can be no assurance that such information will prove to be accurate, as actual results and future events could differ materially from those anticipated in such information. Accordingly, readers should not place undue reliance on forward-looking information. The Company does not undertake to update any forward-looking information, except in accordance with applicable securities laws.

General, Technical and Additional Information

The PEA is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability. Readers are cautioned that mineral resources are not economic mineral reserves and that the economic viability of mineral resources that are not mineral reserves has not been demonstrated. The estimate of mineral resources may be materially affected by geology, environmental, permitting, legal, title, socio-political, marketing or other relevant issues. The Company's current 2023 mineral resource estimate1 (the "2023 MRE") is classified in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum's "2014 CIM Definition Standards on Mineral Resources and Mineral Reserves" incorporated by reference into 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101"). Under Canadian rules, estimates of inferred mineral resources may not form the basis of feasibility or pre-feasibility studies or economic studies except for preliminary economic assessment as defined under NI 43-101. Readers are cautioned not to assume that further work on the stated resources will lead to mineral reserves that can be mined economically. The Company has defined inferred mineral resources in accordance NI 43-101 in respect of its deposits. An inferred mineral resource as defined by the CIM Standing Committee is "that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An inferred mineral resource has a lower level of confidence than that applying to an indicated mineral resource and must not be converted to a mineral reserve. It is reasonably expected that the majority of inferred mineral resources could be upgraded to indicated mineral Resources with continued exploration."

The reader is advised that the PEA summarized in this presentation is only a conceptual study of the potential viability of the Company's Separation Rapids' mineral resource estimates, and the economic and technical viability of the project and its estimated mineral resources has not been demonstrated. The PEA is preliminary in nature and provides only an initial, high-level review of the project's potential and design options; there is no certainty that the PEA will be realized.

Additional information regarding Avalon is filed under the Company's issuer profile on the SEDAR+ website at www.sedarplus.ca and readers are advised to refer to such documents for further information. All dollar amounts are in Canadian dollars unless otherwise denoted.

Industry Data

This presentation also contains or references certain market, industry and peer group data which is based upon information from independent industry publications, market research, analyst reports and surveys and other publicly available sources. Although the Company believe these sources to be generally reliable, such information is subject to interpretation and cannot be verified with complete certainty due to limits on the availability and reliability of raw data, the voluntary nature of the data gathering process and other inherent limitations and uncertainties. The Company has not independently verified any of the data from third party sources referred to in this presentation and accordingly, the accuracy and completeness of such data is not guaranteed.

Cautionary Note to US Persons

This presentation was prepared in accordance with Canadian standards for reporting of mineral resource estimates, which differ in some respects from United States standards. In particular, and without limiting the generality of the foregoing, the terms "mineral resources," "inferred mineral resources," "indicated mineral resources," "measured mineral resources," "mineral reserves," "proven mineral reserves," and "probable mineral reserves" used or referenced in this presentation are Canadian mineral disclosure terms as defined in accordance with NI 43-101 under the guidelines set out in the CIM Standards. These definitions differ from the definitions in subpart 1300 of Regulation S-K ("Subpart 1300"), based on the Committee for Mineral Reserves International Reporting Standards ("CRIRSCO"), which replaced the United States Securities and Exchange Commission's (the "SEC") Industry Guide 7 as part of the SEC's amendments to its disclosure rules to modernize the mineral property disclosure requirements. These amendments became effective February 25, 2019 and registrants were required to comply with the Subpart 1300 provisions by their first fiscal year beginning on or after January 1, 2021. Readers are cautioned not to assume that all or any part of mineral reserves and mineral resources determined in accordance with NI 43-101 and CIM Standards will qualify as, or be identical to, mineral reserves and mineral resources estimated under the standards of the SEC applicable to U.S. companies under Subpart 1300. While

the definitions in Subpart 1300 are more similar to the definitions in NI 43-101 and the definitions in the CIM Standards than were the Industry Guide 7 provisions due to the adoption in Subpart 1300 of terms describing mineral reserves and mineral resources that are "substantially similar" to the corresponding terms under the definitions in the CIM Standards, including the SEC now recognizing estimates of "measured mineral resources", "indicated mineral resources" and "inferred mineral resources" and amending its definitions of "proven mineral reserves" and "probable mineral reserves" to be "substantially similar" to the corresponding definitions under the CIM Standards that are required under NI 43-101, the definitions in Subpart 1300 still differ from the requirements of, and the definitions in, NI 43-101 and the CIM Standards. Investors are cautioned that while the above terms are "substantially similar" to the corresponding definitions in the CIM Standards, there are differences in the definitions in Subpart 1300 and the CIM Standards. Accordingly, there is no assurance any mineral resources or mineral reserves that the Company may report as "inferred mineral resources," "indicated mineral resources," "measured mineral resources," "proven mineral reserves," and "probable mineral reserves" under NI 43-101 would be the same had the Company prepared the mineral resource or mineral reserve estimates under the standards adopted under the standards of the SEC applicable to U.S. domestic companies under Subpart 1300. Investors are also cautioned that while the SEC recognizes "inferred mineral resources," "indicated mineral resources," and "measured mineral resources" under Subpart 1300, investors should not assume that any part or all of the mineralization in these categories will ever be converted into a higher category of mineral resources or into mineral reserves. Mineralization described using these terms has a great amount of uncertainty as to its existence, and great uncertainty as to its economic feasibility than mineralization that has been characterized as reserves. Accordingly, investors are cautioned not to assume that any measured mineral resources, indicated mineral resources, or inferred mineral resources that the Company reports are or will be economically or legally mineable. Under Canadian rules, estimates of "inferred mineral resources" may not form the basis of feasibility or other economic studies, except in limited circumstances. Readers are also cautioned not to assume that all or any part of an inferred mineral resource exists. The term "resource" does not equate to the term "reserves". Accordingly, information contained in this corporate containing descriptions of the Company's mineral deposits may not be comparable to similar information made public by United States companies subject to the reporting and disclosure requirements under the United States federal securities laws and the rules and regulations thereunder.