

# **Advancing Ontario's Energy Transition: The Lake Superior Lithium Project**

## **Executive Summary**

Avalon Advanced Materials is on the cusp of launching Ontario's first lithium processing facility at its strategic site in Thunder Bay on Lake Superior. With the opportunity to break ground as early as 2027, the Lake Superior Lithium Project is ideally positioned for funding. This initiative aligns with Canada's Critical Minerals Strategy by enhancing supply chain resilience, fostering economic growth, and supporting the transition to a green and digital economy.

The Lake Superior Lithium Project stands out because of its advanced project phase, strategic location and existing infrastructure, and it boasts unique partnerships that will help transform the landscape of the mining industry. These features underscore the unique importance of the Lake Superior Lithium Project, and the critical need for robust support. As we continue to advance our project, we invite prominent ambassadors to join us in advocating for the necessary funding to bring this transformative initiative to fruition.

## **Introduction**

The global lithium market is projected to grow from USD 38.2 billion in 2022 to USD 230.4 billion by 2031, with a CAGR of 22.1%. This escalating demand is driven primarily by vehicle electrification. As industries worldwide accelerate towards a more sustainable future, the market dynamics for lithium will undergo changes.

Recent strategic acquisitions in the lithium sector, such as Rio Tinto's \$6.7 billion purchase of Arcadium—even amid lower lithium prices—highlight the industry's confidence in the enduring value and escalating demand expected by 2030.

The Lake Superior Lithium Project aims to capitalize on this growth, by establishing a strategically located facility that supports North America's lithium supply chain. Our aim is to harness the global momentum by consolidating the resource supply from the upcoming operational mines (such as Green Technology's Seymour Mine which is set to be in production by 2025). With the right support, funding approvals, and streamlined permitting, Avalon can significantly accelerate the timeline of the Lake

Superior Lithium Processing Facility, positioning both Canada and its people to capitalize on the growing demand for critical minerals.

## **Competitive Advantages and Unique Value Proposition**

### **1. Site Location and Existing Infrastructure:**

- Strategically located at a provincial midpoint between the resources of the north and downstream EV battery and automotive manufacturing hubs in the south.
- Key advantages of the site:
  - Industrial Zoning: The site is fully zoned for industrial use, ensuring minimal delays in project approval.
  - Utilities: Water, sewage, hydro, and natural gas infrastructure are already in place.
  - Transportation Infrastructure:
    - Rail: Direct access to a rail spur connected to the CN railway line
    - Port Access: The site has immediate access to a deep-water port, and a port warehouse.
    - Road Access: Proximity to the TransCanada Highway and unrestricted road access.
  - Environmental Benefits: The site has existing environmental permits, including a closed landfill.
  - Community Support and Workforce Availability: Located near Thunder Bay, the site offers access to a skilled workforce and a community that will benefit from the economic opportunities this facility will provide.
- Why this is important:
  - Quick implementation: ready to use-infrastructure, site selection and verification, accelerates project start-up, minimizing delays.

- Cost-efficiency: reduced need for new infrastructure lowers capital expenditures.
- Resource allocation: Freeing up additional resources that can be redirected toward community considerations, such as local workforce development, environmental stewardship, and community engagement initiatives.
- The projects location will create high-quality, well-paying jobs for local residents, including Indigenous Peoples.

## **2. Advanced Phase of the Project:**

- The Lake Superior Lithium Project is in an advanced phase. Avalon has successfully completed a Preliminary Economic Assessment (PEA), demonstrating the economic viability of its project. The economic viability of the Project was further solidified by an economic impact assessment showcasing the tangible benefits our project will deliver. The company is ready to advance to the next phase of the project.
- Why this is important:
  - The advanced status reduces uncertainty and further accelerates the project timeline.
  - Provides crucial validation for the projects positive impact at local, regional, provincial, and national levels.
  - Market Readiness: faster go-to-market execution.
  - First-Mover Advantage: earlier completion of our Project positions Thunder Bay, and Canada to capture a larger market share as lithium demand surges.

## **3. Resource Security and Supply Chain Integration:**

- Avalon aims to consolidate lithium feedstock from nearby mines, as well as international, ensuring a steady, secure supply of raw materials.
- There are nearby mines that are set to become operational just in time to support the launch of our processing facility.

- Active negotiations with several companies for feedstock supply, including a strategic partner prepared to invest \$50 million to support the consolidation of these resources.
- Why this is important:
  - Ontario's lithium industry is fragmented, with several companies pursuing parallel, but separate projects. The ability to consolidate and coordinate with these companies will create a seamless integration between mining and processing operations, which helps develop Canadian value chains and reduces dependency on foreign inputs.

#### **4. Sustainability Initiatives**

- Partnership with Metso Corp: Collaborating with leading technology expert in sustainable solutions, this will expedite both the construction and operational phases of the processing facility ensuring efficiency and environmental responsibility.
- Solar Farm: plans to incorporate a solar energy park to power the facility, contributing to Avalon's goal of achieving NetZero emissions.
- By-product repurposing plans (analcime): initiating a strategy to repurpose analcime, a by-product of lithium hydroxide processing, for use as a sustainable concrete additive.
- Indigenous Reconciliation
- Why this is important:
  - Contributes to Canada's climate action goals
    - Commitment to NetZero: By integrating renewable energy sources and technologies that reduce emissions and harmful products, the facility aligns with Canada's climate action goals and reinforces its position as a leader in environmentally responsible mining practices.
    - Waste-free initiatives: reduces the environmental footprint of the facility but also enhances operational efficiency, aligns with global sustainability standards
  - Metso Corp partnership brings unparalleled expertise in sustainable construction and operations. Their experience ensures a smooth,

efficient build and operational setup, accelerating timelines and guaranteeing adherence to best environmental practices.

## **5. Advanced Technology Adoption:**

- Avalon intends on investing in cutting-edge technology, automation, and AI-driven processes, our facility is set to enhance productivity, support sustainability initiatives. These innovations allow for optimized production, as well as allow us to create reskilling programs that will ensure our workforce (and future students) can leverage new technologies effectively, preparing them for the future of industrial work.
  - The following are technology initiatives of the Lake Superior Lithium project
    - Digital traceability & reporting
      - Material tracking using IoT devices
      - IoT for ESG
    - Safety, Security, Surveillance & Operator Assistance
      - Security, surveillance, and access control using Edge AI
      - Gen AI for plant/operator worker assistance and maintenance
    - Communication infrastructure for operations
      - 5G for the processing plants
    - Operations Management
      - Digital twin at Technology Innovation Centre
      - Solar Energy Park
      - NetZero tracking dashboard
- Why this is important:
  - Avalon's training programs and focus on technological innovation will create inclusive career opportunities for marginalized communities to align with Canada's diversity and inclusion objectives.
  - Canada as a leader in digital transformation: modernizing the mining industry and showcasing the benefits of advanced technology adoption.

- Future-proofing the workforce: upskilling and reskilling programs, training workers (and students) on new technologies, making their jobs more valuable and future-proof. Ensures the workforce sustains high-paying jobs and long-term employment in a competitive, tech-driven economy.
- Safer work environment: AI-driven security and predictive maintenance ensures the safety of our workforce.
- Increased productivity and satisfaction: automation frees workers from routine tasks, boosting productivity and job satisfaction.
- Sustainability and environmental impact reduction: by implementing technologies to help track and reduce environmental impact, driving Canada’s progress towards net zero.
- Advanced technologies and sustainability measures enhance the economic

## 6. Demonstrated Economic Impacts:

The Lake Superior Lithium Project represents a strategic infusion into Canada's mining sector. Please note that there are several potentially significant additional economic benefits that were not quantified in the below findings.

Metrics	Local	Regional	Provincial	National
<b>Construction Phase</b>				
<b>GDP (million)</b>	\$698 to \$718	\$721 to \$765	\$733 to \$836	\$754 to \$878
<b>Labour Income (million)</b>	\$125 to \$137	\$139 to \$165	\$152 to \$212	\$164 to \$234
<b>Person-Years of Employment <sup>(1)</sup></b>	945 to 1,133	1,153 to 1,553	1,312 to 2,232	1,490 to 2,589
<b>Operational Phase</b>				
<b>GDP (billion)</b>	\$21.3 to \$21.4	\$25.4	\$26.2 to \$26.5	\$31.0
<b>Labour Income (billion)</b>	\$0.851 to \$0.915	\$2.9	\$3.4	\$5.4 to \$5.6

<b>Person-Years of Employment <sup>(1)</sup></b>	9,866 to 10,911	42,724 to 43,426	49,767 to 52,176	77,412 to 79,874
<b>Total Impacts (2027-2058)</b>				
<b>GDP (billion)</b>	\$22.0	\$26.0	\$27.0 to \$27.4	\$31.6 to \$32.0
<b>Labour Income (billion)</b>	\$0.975 to \$1.0	\$3.0	\$3.6 to \$3.7	\$5.6 to \$5.8
<b>Person-Years of Employment <sup>(1)</sup></b>	10,811 to 12,044	43,877 to 44,979	51,078 to 54,408	78,903 to 82,464

(1): Person-Years of Employment refers to the amount of work provided by one person employed full-time for one year, used to measure total labor input over time for a project or activity.

Why this is important:

- The economic impact of the Lake Superior Lithium Project will generate significant GDP growth on local, regional, provincial, and national levels. This ensures the sustained growth of Canada’s economy and helps strengthen the country’s position as a leading player in the critical minerals sector.
- By creating thousands of person-years of employment, the project will provide stable, well-paying jobs for Canadians, contributing to long-term economic stability and prosperity.

**Role of the Ambassadors**

To ensure the success of this pivotal project, we are seeking support from the prominent ambassadors who can advocate for our project at local, regional, provincial, and national levels. Ambassadors can assist through outreach to the following:

- **FedNor**
  - Giuseppe Buoncore
    - [giuseppe.buoncore@fednor.gc.ca](mailto:giuseppe.buoncore@fednor.gc.ca)
- **Engage Local Government**
  - Thunder Bay City Council
    - Mayor:
      - [ken.boshcoff@thunderbay.ca](mailto:ken.boshcoff@thunderbay.ca)
    - Councillors

- [Rajni.Agarwal@thunderbay.ca](mailto:Rajni.Agarwal@thunderbay.ca)
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    - Chair of the Board
  - Jason Thompson
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  - Jamie Crozier
    - Thunder Bay Hydraulics
  - Jen Duggan
    - Vice Chair
    - Carol's Cakes & Bakery
  - Jeff Heney
    - Venshore Mechanical
  - Maria Holland
    - RBC

- Katie McCormack
  - Impala Canada
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