Quebec: The most effective Aluminum ecosystem in the world

$1.72 B
PROJECT NPV (AFTER TAX)

32.8%
PROJECT IRR (AFTER TAX)

BEST
QUEBEC, top mining jurisdictions

75%
of Aluminum Production Market
With lowest CO2 footprint

PLAN NORD Infrastructures Program
- Roads
- Rails
- Power
- Infrastructures
What is Scandium?

**Scandium**: is a chemical element with the symbol Sc and atomic number 21. It is a silvery-white metal that belongs to the transition metals group of the periodic table. Scandium is relatively rare in nature and is considered a rare earth element.

**Metal Properties**: Scandium is a lightweight metal with a density similar to aluminum. It has a high melting point and is relatively soft, making it easy to shape. Scandium is also a good conductor of electricity and heat. Scandium-aluminium alloys provide lightweight, high-strength and corrosion resistant equipment parts.

**Applications**: Scandium-aluminum alloys are utilized in the manufacturing of high-performance component for aerospace, aircraft, missiles, and satellites. The green energy technology is also requiring these alloys in EV frames and battery kits as well as wind turbine technology.
Multiple Market Drivers - Scandium Market Severely Undersupplied

Scandium demand projections show a very significant need for new mining capacity.

To meet 2040 demand, current capacity needs to increase by a factor of over 50.

Source: Internal EY Internal Market Study 2022
Strategic Plan and Milestones

1- **Exploration**: Geology, Geophysics and Drilling. This milestone is completed and proved an important upside for the project as only 10% of the property has been explored.

2- **Mineral Resources & PEA**: WSP Canada, calculated that the project has an aftertax NPV(10%) of C$1.7-billion and an IRR of 32.8%, operate for 25 years, generating C$608-million a year in revenue from the sale of scandium-Aluminum master alloy (ScAl) and rare earth element (REE) hydroxide concentrate.

3- **Strategic Partners**: Canadian and US government agencies, Aluminum ecosystem, EV, Space & Aeronautics, Defense, etc., will increase market certainty and reduce shareholders exposure to risks and dilution.

4- **Product Development**: Marketing, specific product demand and offtake will increase the certainty of the financial model and at the same time improve the financing conditions.

5- **Detail Engineering**: Detail engineering of the mining facilities as well as the processing facilities with the Strategic Partners will be important to optimize CAPEX and OPEX.

6- **Financing + Construction + Production**
**Crater Lake Scandium Project**

**Preliminary Economic Assessment**

$1.7Bn NPV showing very considerable upside

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>ANNUAL IMPACT</th>
<th>Life-of-Mine IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Metal Revenues</td>
<td>$608.0 million</td>
<td>$15.2 billion</td>
</tr>
<tr>
<td>After-Tax Cash Flows</td>
<td>$250.4 million</td>
<td>$6.3 billion</td>
</tr>
<tr>
<td>Net Present Value&lt;sub&gt;(\alpha-t/10%) (\text{a-t/10%})</td>
<td>---</td>
<td>$1.72 billion</td>
</tr>
<tr>
<td>Internal ROR&lt;sub&gt;(\alpha-t) (\text{a-t})</td>
<td>---</td>
<td>32.8%</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>$381/t of mill feed</td>
<td>---</td>
</tr>
<tr>
<td>Concentrate Value</td>
<td>$1,100/t CAN(*)</td>
<td>---</td>
</tr>
<tr>
<td>CAPEX (Direct &amp; Indirect)</td>
<td>---</td>
<td>$712 million</td>
</tr>
<tr>
<td>Contingency (25%)</td>
<td>---</td>
<td>$159 million</td>
</tr>
<tr>
<td>Minimum Mine Life</td>
<td>---</td>
<td>25 years</td>
</tr>
</tbody>
</table>

With an LOM operating margin of 63.8%, the **CAPEX payback period (after-tax)** estimated at ~3.0 years from the start of production.

*PEA Study available at:* [https://imperialmgp.com/site/assets/files/5267/211-11382-00-tcr-1000-g-001_ra_crater_lakescandium_pea.pdf](https://imperialmgp.com/site/assets/files/5267/211-11382-00-tcr-1000-g-001_ra_crater_lakescandium_pea.pdf)
## Crater Lake Scandium Project, Quebec

### TGZ Mineralized Zone (43-101)

**Projection Looking East**

- **Indicated resources**
- **Inferred resources**
- **Pit shell**

### RESOURCE ESTIMATE TABLE

<table>
<thead>
<tr>
<th>Category</th>
<th>Cut-off NSR ($/t)</th>
<th>Tonnage (Mt)</th>
<th>NSR total ($/t)</th>
<th>Sc2O3 (g/t)</th>
<th>Dy2O3 (g/t)</th>
<th>La2O3 (g/t)</th>
<th>Nd2O3 (g/t)</th>
<th>Pr2O3 (g/t)</th>
<th>Tb4O7 (g/t)</th>
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</thead>
<tbody>
<tr>
<td>Indicated</td>
<td>110.1</td>
<td>11.8</td>
<td>426</td>
<td>275.9</td>
<td>66.4</td>
<td>605.5</td>
<td>596.9</td>
<td>160.1</td>
<td>11.7</td>
</tr>
<tr>
<td>Inferred</td>
<td>110.1</td>
<td>15.9</td>
<td>414</td>
<td>268.4</td>
<td>66.1</td>
<td>606.9</td>
<td>595.6</td>
<td>159.8</td>
<td>11.6</td>
</tr>
</tbody>
</table>
Experienced Management Team

**Pierre Neatby**
President and CEO
- Over 30 years in the base and strategic metals business
- 20 years with Noranda
- 9 years in rare earths with Avalon
- International experience (London, Madagascar) working with consumers in all continents.
- Specific experience in the aluminum business

**Ms. Isabelle Gauthier, CPA**
CFO, Corporate Secretary
- Extensive expertise in public companies, primarily in the mining sector including consolidation of foreign entities, M&A, reverse takeover, spin-out and financial reporting.
- Over 20 years of accounting, transactional and reporting experience.
- Past Senior Manager within the firm Raymond Chabot Grant Thornton

**Dr. Luc Duchesne**
Vice-President, Corporate Development
- 30 years of strategic marketing and project management, bridging science with business
- 15 years of senior level management and technical experience for government and industry
- Demonstrated expertise in relationship-building in Academic and Government circles, particularly regarding advanced material applications
- Obtained his PhD from University of Guelph

**Dr. Mark Gallerneault, P.Eng.**
Technical Advisor, Alloy Development
- Dr. Gallerneault has extensive industrial R&D experience related to solidification and modelling of light metal alloy systems
- He holds numerous patents and has published a substantial collection of scientific papers, in addition to having co-founded a successful materials research company, Alcereco
- Previously served as Director of Novelis’ (Alcan) Global Technology Centre

**Pierre Guay, P.Geo.**
Technical Advisor, Exploration
- Over 25 years experience in exploration, mine development and production
- Led the Quest Minerals’ team as Manager of Exploration that developed the Strange Lake rare earth deposit
- Formerly an Area Geologist with Vale Inco Exploration for 19 years
Highly Respected Board of Directors

Jeff Swinoga, MBA, CPA
Chairman of the Board
- Formerly EY Canada’s National Mining and Metals Co-Leader
- Held CEO/CFO positions for intermediate to large companies with 25 years of experience in the minerals sector and finance
- Extensive international experience in mine project financing in North/South America and Africa

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President and CEO
- Over 30 years in the base and strategic metals business
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- Specific experience in the aluminum business

Alain Bureau, P.Eng.
Director
- 20 years of experience in mining and project construction throughout the Americas
- Graduated with high honours in Mechanical Engineer from the Royal Military College of Canada
- Has received numerous important industry acknowledgements, including TSX’s Top 10 exploration companies award in 2012 and the prestigious PwC’s Top performing mining explorers award in 2013

Nick Nikolakakis, MBA
Director
- Over 26 years of financial management, strategic and capital planning, finance and accounting mining sector experience, having raised over $2 billion in capital.
- Holds a B.Eng in Mining Engineering from U of Waterloo and an MBA from U of Toronto.

Philippe Cloutier, P.Geo.
Director
- Over 25 years of experience in mining exploration and development business
- Currently President & CEO of Cartier Resources Inc., a Quebec-based exploration company
- Previously worked with Noranda Inc., Aur Resources Inc. and SOQUEM
- Part of the exploration team that discovered the Bell-Allard South mine in Matagami.

Brooke DeLong
Director
- A communication and change management leader with more than 20 years of corporate and operations experience within the mining industry
- A trusted advisor on communications, change management and global governance matters through her current role as Director, Change Management & Internal Communications at Centerra Gold Inc.
- Was previously the Manager, Communications with Vale

Pierre Neatby
President and CEO
- Over 30 years in the base and strategic metals business
- 20 years with Noranda
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- International experience (London, Madagascar) working with consumers in all continents.
- Specific experience in the aluminum business
Scandium’s Unique Characteristics Drives High Demand Growth

**Key Applications:**
- Solid oxide fuel cells (SOFCs)
- Scandium-aluminum alloys: aerospace, automotive aerospace industries
- Ceramics
- Electronics
- Lighting: in metal halide lamps

**Key data**
- Pure Scandium metal is at around 14,000 $/kg
- Scandium oxide is priced at $2,000-$2,500 US/kg
- The world production of scandium (as scandium oxide) is in the order of 30-35 tonnes per year
- Current demand is about 50% higher, and expected to increase dramatically

Source: Scandium Aluminium Europe Final Program Results, SEP 2021
Global Political Tension Pushing N Am and EU to Secure Domestic Sc/REE Supply

Need of alternative material supply sources to mitigate this risk

Chinese conflict with Japan led to REE embargo and demand destruction due to high global prices

COVID-19 Pandemic led to disruption of global PPE supply chains

Escalating political tension between U.S. and China

US-China trade dispute led China to threaten limits to REE exports to the US causing brief price spikes

Russia’s invasion of Ukraine causes broad-based commodity price disruptions. Led to Energy Security issues in the EU.

China and Russia are important suppliers of critical materials such as rare earths (scandium), refined titanium, nickel, battery chemicals (lithium, cobalt) – puts into doubt the stability of global supply chains: “Continental” supply chains are favoured.
Scandium Provides Superior Strength

Adding scandium to aluminum increases strength by up to 800%

EV Revolution Driving Demand for Scandium

Scandium enables the lighter construction of critical vehicle components, including batteries, reducing fuel use, increasing range, reducing the carbon footprint, driving demand.

Source: NEMAK Corporate Presentation – AUG 2021
Scandium Alloys Enables Lighter Aircraft

Air travel accounts for 3% of Worldwide GHG: at current trends, air travel emissions will triple by 2050 (Intl. Civil Aviation Organization, 2018)

➢ AIRBUS SA has patented scandium-aluminum alloys for both the welding of aircraft structures and as AM (3D printing) powders as a platform lightweighting product.

➢ In use as welding versus rivets for assembly, this would reduce weight by 20% and generate a **$10-$15 million NPV fuel saving over aircraft operating life.**

➢ Each A320 neo requires on average 500-600 kg of scandium or 1.5 % of current global annual production.

➢ Boeing estimates that AM use would contribute to significant reductions in aircraft weight as well as **reducing manufacturing costs by up to $US3.0 million per aircraft*.**
Scandium - an Important Fuel Cell and Hydrogen Production Enabler

The EU considers Scandium to be a critical material in hydrogen production because of the element’s very high hydrogen absorption properties and its resistance to decomposition of the fuel.

Solid Oxide Fuel Cell (SOFC) benefits include high efficiency, long-term stability, fuel flexibility, low emissions and relatively low cost.

Scandium major use is in the SOFC’s Scandia-Stabilized electrolyte, allowing lower operating temperatures and longer cell life vs Y-stabilized ($700^\circ C$ vs. $1000^\circ C$).

Bloom Energy Corp (NYSE:BE) is largest consumer of Sc in Western markets and is focused on building microgrids to support EV growth.

Scandium addition in Metal Hydrides for Hydrogen Storage are workable. Cost of Scandium would not be as prohibitive as once thought. Sc-Al would be less than USD$6/kg. Current tank costs are circa USD$100/kg for Composite Materials.

Palladium is also a key input material for Scandium Thin film alloys. Scandium/Magnesium Thin film alloys doped with Palladium can be used as a Hydrogen membrane barrier.

* 20% of EVs will be powered by fuel cells by 2030 = 6 million vehicles (Bloomberg, 2019)
Pierre Neatby
President and CEO

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