

***Sustainable Battery Value Chain  
Showcase Series***

**DUE DILIGENCE &  
PROMOTING  
ESG PERFORMANCE**

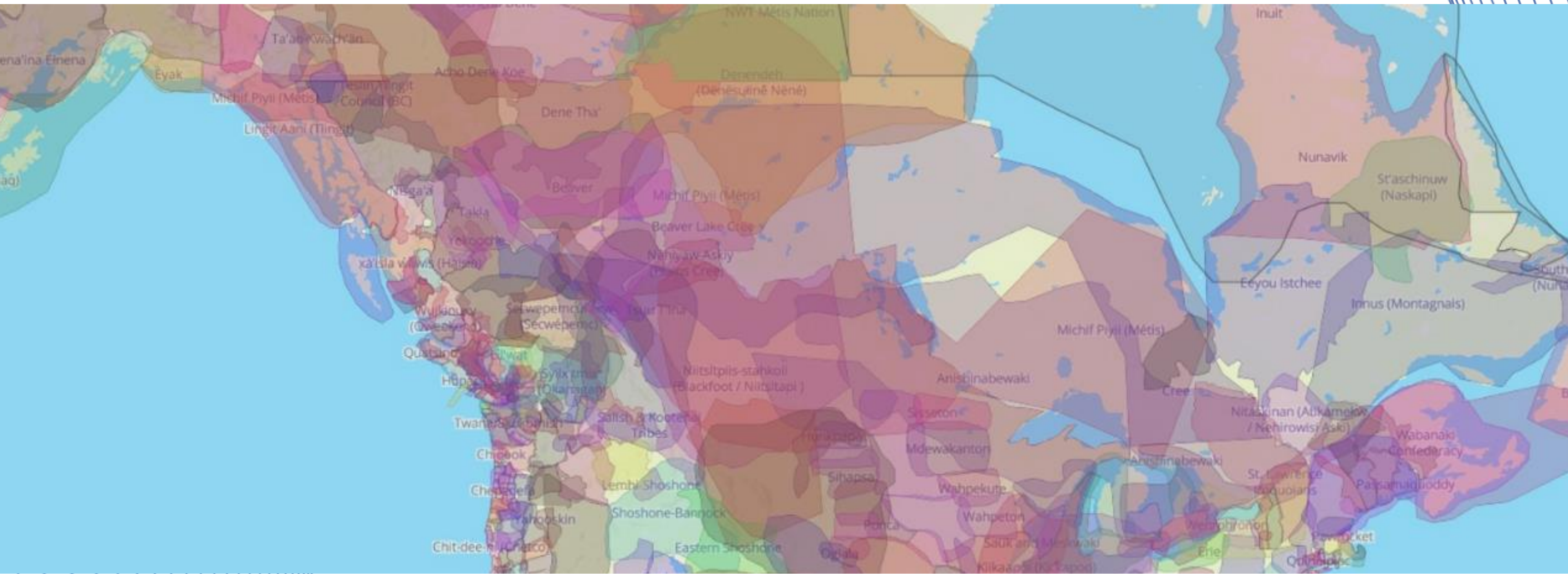
KarChi Lee, Benchmark Mineral Intelligence

Matthew McCulloch, Norda Stelo

Stephan Theban & Michelle Gluck, SLR Consulting



# Land Acknowledgement





**This technical symposium is made possible by financial contribution from the Mining Sector Team at NRC IRAP (National Research Council – Industrial Research Assistance Program).**

**If you would like to connect with NRC IRAP, please contact Peter Howell:**

**[Peter.Howell@nrc-cnrc.gc.ca](mailto:Peter.Howell@nrc-cnrc.gc.ca)**



## **Stephan Theban**

*SLR Consulting*

Managing Principal,  
Mining Sector Lead



## **Michelle Gluck**

*SLR Consulting*

Senior ESG Consultant  
Team & Regional Sustainability Lead



## **Matthew McCulloch**

*Norda Stelo*

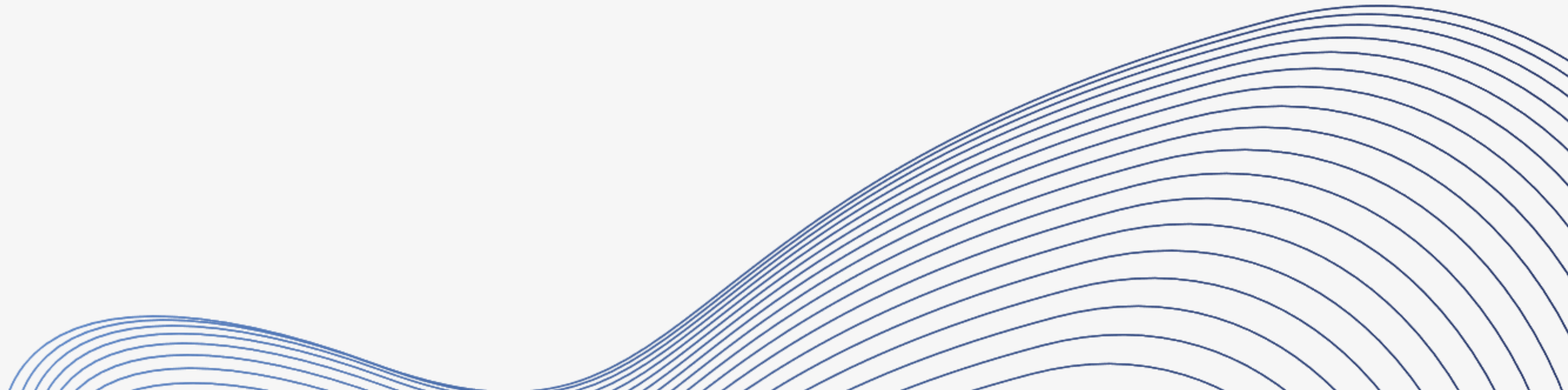
Director, ESG &  
Decarbonisation



## **KarChi Lee**

*Benchmark Mineral Intelligence*

Sustainability Analyst



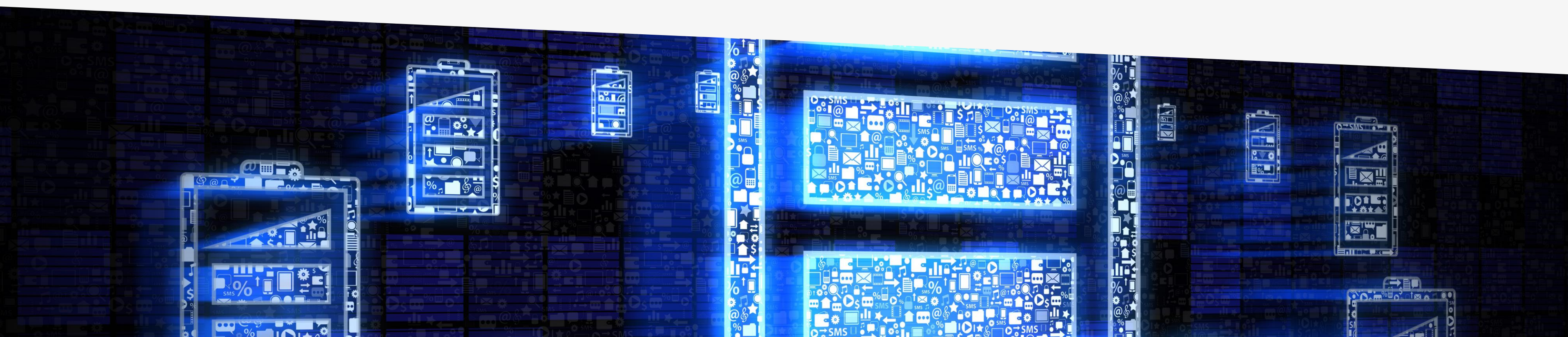
# Join Us, for the Rest of the ESG Series...

## **Sustainability Disclosures & Access to Capital**

January 2025  
Timing to be Announced

## **Battery Regulations & Producer Responsibility**

January 2025  
Timing to be Announced



# Thank You!



## BMAC

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Battery Metals  
Association of Canada

# Contact Us

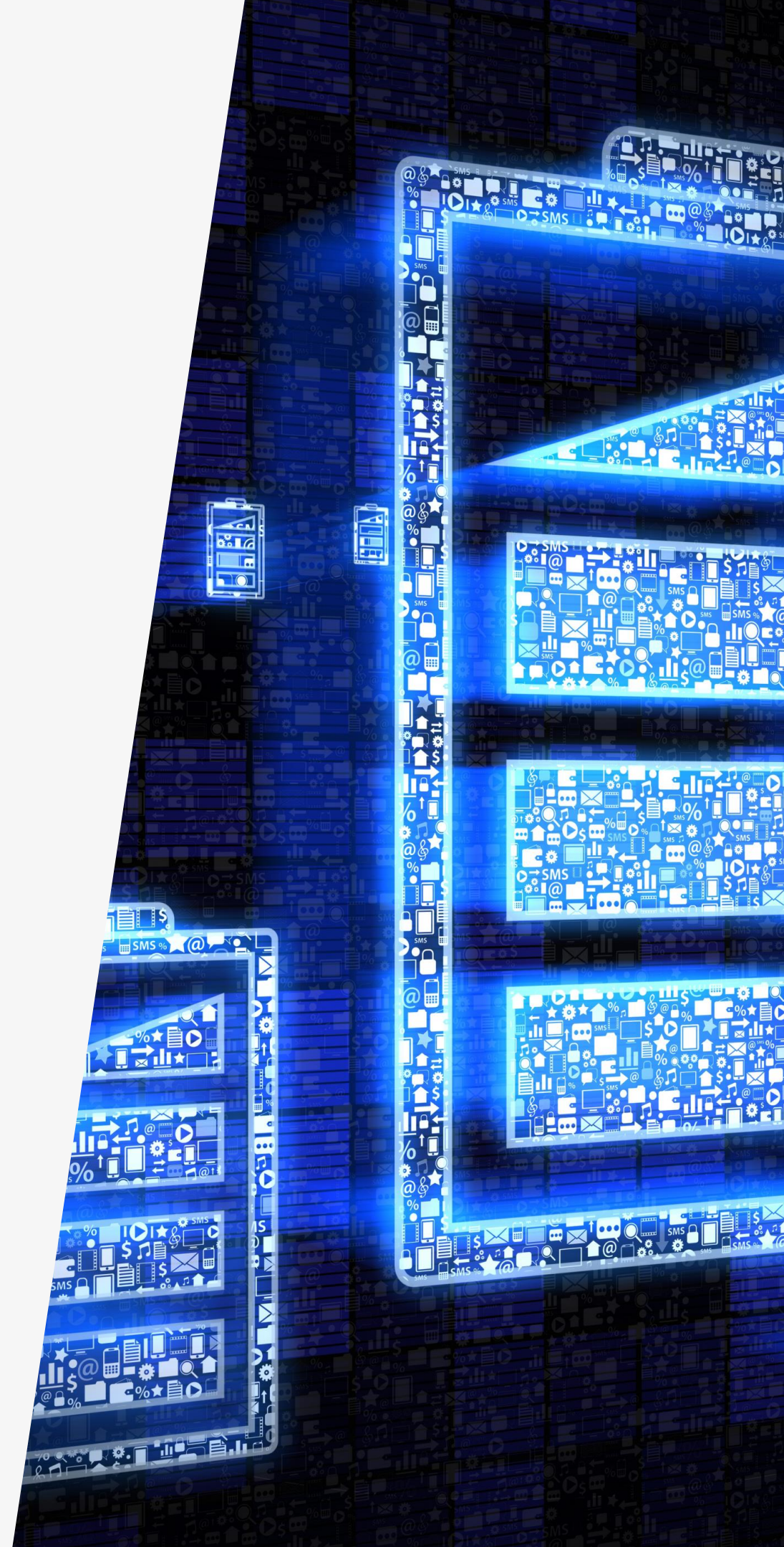
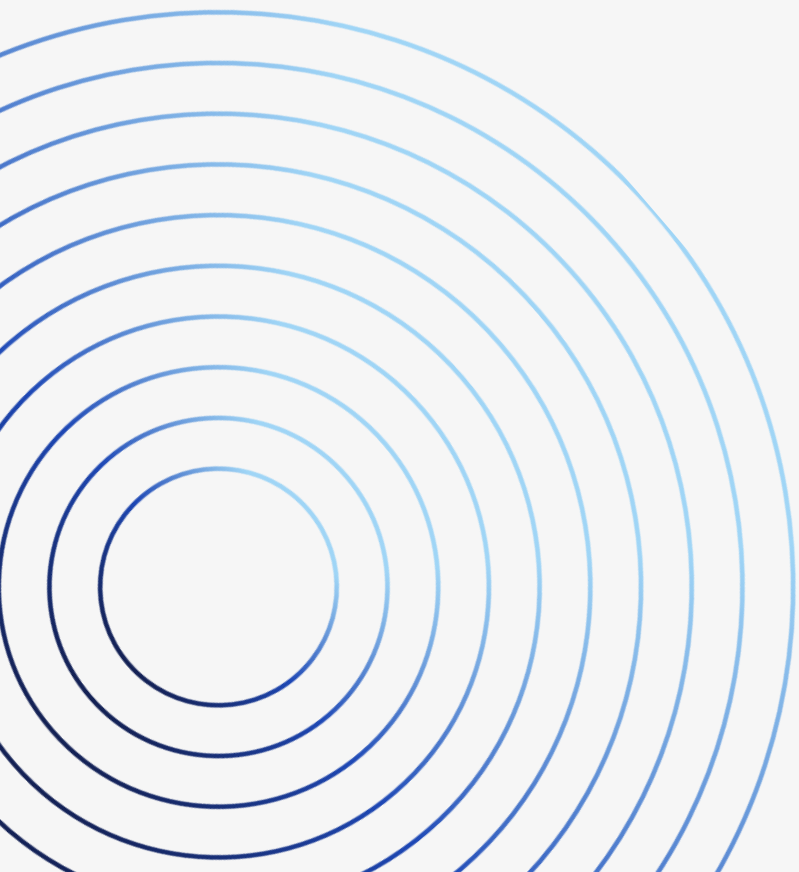
Find us here for more information about the  
Battery Metals Association of Canada:



[info@bmacanada.org](mailto:info@bmacanada.org)



[www.bmacanada.org](http://www.bmacanada.org)



# A Sustainable, Traceable & High-Resolution Canadian EV Battery Supply Chain

Webinar: December 4th, 2024

Battery Metals Association of Canada

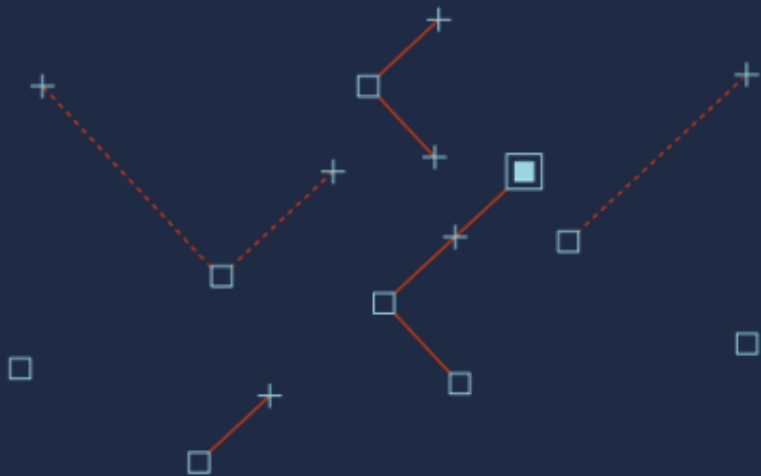
**BMAC** | Battery Metals  
Association of Canada





# We are Norda Stelo

In an ever-changing world, we serve as a proactive partner invested in the delivery of **engineering consulting and construction projects** since 1963.



# Norda Stelo

## 18 offices

- Quebec (11)
- Ontario
- Newfoundland and Labrador
- British Columbia (2)
- Alberta
- Utah
- New Caledonia

## +900 professionals

## 7 business sectors

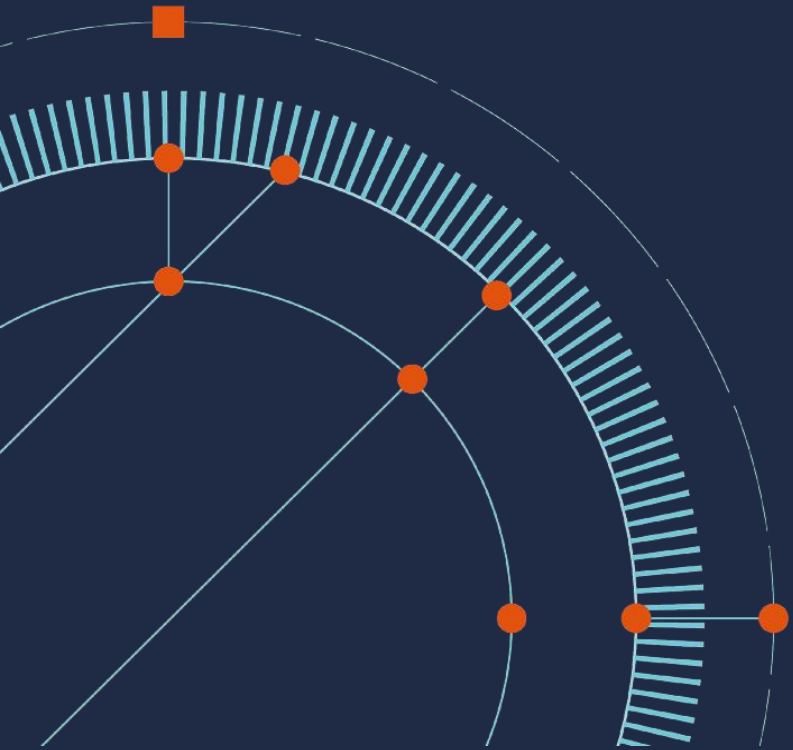
- Energy
- Manufacturing and Processing
- Railways
- Mining and Metallurgy
- Ports
- Roads
- Sustainable Communities





- First major engineering firm in Canada to receive B Corp Certification
- Impact Business Model
- Net Zero through innovation

# Our Centres of Excellence



Environment, Climate Change and Community



Electricity



Railway



Asset Integrity and Reliability Management



Automation, Robotics and Industrial IT



Building



Mechanical and Material Handling



Geology



Mining Engineering



Smart Mobility



Bridges



Ports and Coastal



Processes



Roads



Structure



Civil Engineering Works



Piping and Pressure Vessels

# Initiative Overview

## Vision

To build a Canadian battery supply chain that provides new sourcing opportunities and marketing-related information to supply chain leaders while securing our position as the leader in ESG performance of EV battery production globally.

## Objective

To build a framework over time that quantifies and traces the carbon and ESG performance of a Canada-centric EV battery supply chain.

## Desired Outcome

To strengthen and build a Canadian-centric supply chain over time through increasingly improved performance with high transparency and traceability.



1. Provide **critical insights** into Scope 3 emissions as well as opportunities for improving performance of supply chain.
2. **Strengthen relationships** to support growth of a secure Canadian-centric battery supply chain.
3. Provide a new platform with **higher levels of transparency** and visibility with performance-related data that will support access to markets including meeting the 2027 EU Battery Passport.
4. Incrementally facilitate development of a **green premium** for both critical minerals and a battery itself.
5. **Improve reputation** and/or avoid future reputational damage.
6. Facilitate access to **new investment dollars** and potential future Canadian federal and provincial government financial support.
7. **Support comparative analysis** of other supply chains.



Value Proposition to  
Supply Chain Actors?

# Features and Scope

## Unique features:

- Tracing and visualizing supply chain data: Optchain.
- Piloting high resolution asset/equipment level data: Stelar.

## Core activities:

- Supply chain industry engagement.
- LCA system design and development.
- Supply chain traceability system deployment.
- Facility level data gathering and integration.
- LCA system modelling and reporting.
- Comparative LCA data research.
- Critical review as per ISO 14040 standards & communication of results.



STELAR



## **Stelar : Proven Asset Management Platform**

Stelar is a platform based on asset integrity and reliability engineering practices capable of helping to plan capital investments for an organization by taking into account asset health, maintenance and growth budgets in addition to GHG and broader environmental aspects.



# Stelar Structure: Integrating Carbon



**Collect and centralize** all data relating to the state of assets, including GHG



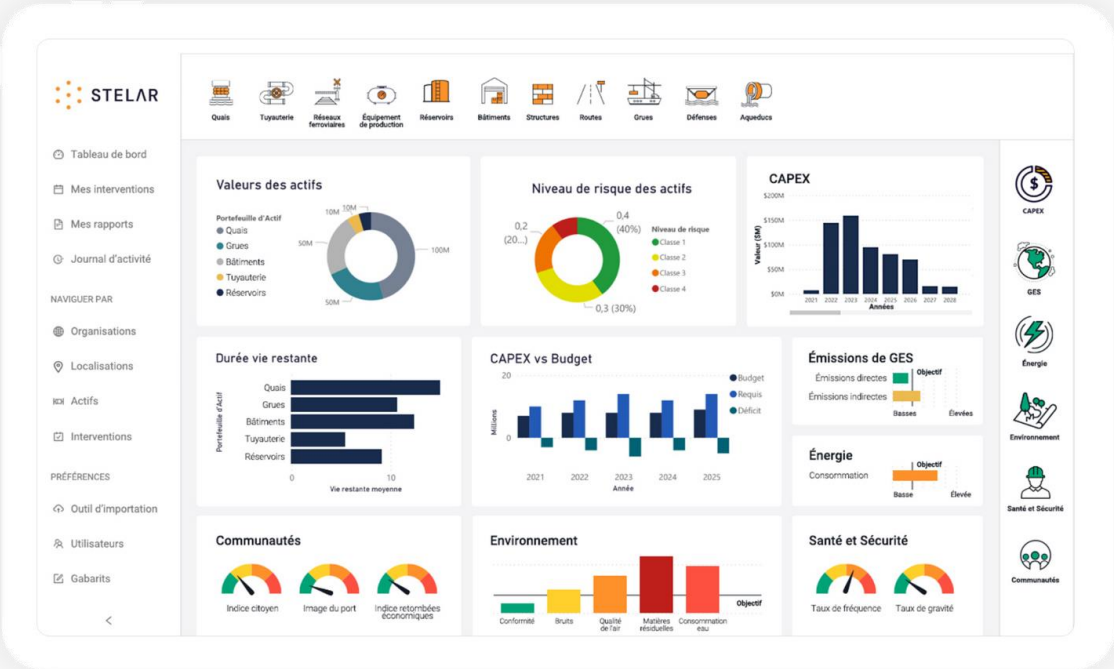
**Analyze and calculate** fault severity, asset health status, GHG performance



**Prioritize and budget investments** based on risk over time and carbon footprint (replace vs. maintain)



**Visualize and assess** the overall condition of the asset base + GHG performance



- Traceability Performance >
- Carbon Tracking >
- Emission Factor
- Product Carbon Footprint**
- Operational Overview
- Scenario Analysis
- Supply Chain Visibility >
- Reporting >
- Administration >
- Battery Passport >

### Product Carbon Footprint

11/01/2024 - 11/15/2024



### Key Performance Indicators

<p><b>Average carbon footprint</b> <span style="float: right;">⚠ Last update: 11/15/2024</span></p> <p>9824kg CO2e/Battery Increased 2.2% since last period</p>	<p><b>NMC battery</b> <span style="float: right;">Last update: 11/15/2024</span></p> <p>10523,2kg CO2e/Battery Decreased by 1.2% since last period</p>	<p><b>Scope 3 per battery (NMC)</b> <span style="float: right;">⚠ Last update: 11/15/2024</span></p> <p>9436.3kg CO2e/Battery Increased 2.5% since last period</p>
<p><b>Scope 2 per battery (NMC)</b> <span style="float: right;">Last update: 11/15/2024</span></p> <p>185kg CO2e/Battery Decreased by 0.8% since last period</p>	<p><b>Scope 1 per battery (NMC)</b> <span style="float: right;">Last update: 11/15/2024</span></p> <p>132,8kg CO2e/Battery Decreased by 1.4% since last period</p>	

## Compare Product

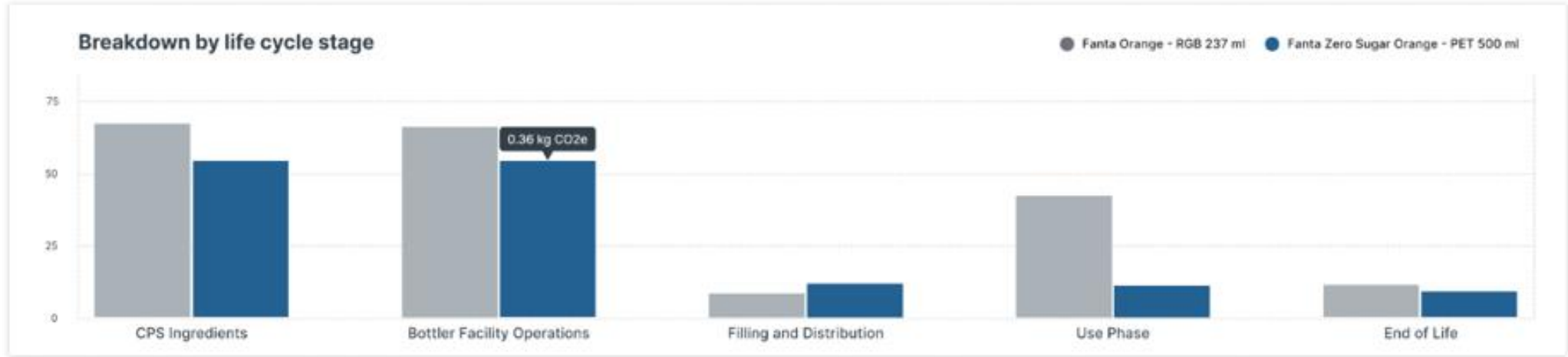
Select the products you would like to compare

Year	Product 1	System Boundary 1	Year	Product 1	System Boundary 1
2023	Fanta Orange - RGB 237 ml	Cradle-to-Grave, ISO 14040...	2023	Fanta Zero Sugar Orange -P...	Cradle-to-Grave, ISO 14040/...
<b>Product Carbon Footprint</b> <b>0.12 kg CO2e</b>		<b>Carbon Footprint Per Unit of Meas...</b> <b>0.50 kg CO2e/kg</b> <i>40% Lower</i>	<b>Product Carbon Footprint</b> <b>0.41 kg CO2e</b>		<b>Carbon Footprint Per Unit of Meas...</b> <b>0.83 kg CO2e/kg</b>
<b>Water Consumption</b> <b>0.237 liters</b>		<b>Primary Data Share</b> <b>9%</b> <i>75% Lower</i>	<b>Water Consumption</b> <b>0.5 liters</b>		<b>Primary Data Share</b> <b>12%</b>

Select products to compare – dashboards are automatically generated.

You can also compare aggregated product portfolio using predefined Tags.

Select Compare Product



# Dashboard

Product:  System Boundary:  Period:

<b>Total Carbon Footprint</b> <b>0.181 kg CO2e</b> 4% Better	<b>Carbon Footprint per Liter</b> <b>0.551 kg CO2e</b> 4% Better	<b>Primary Data Share</b> <b>20%</b> 20% 11% Better	<b>Highest Contributing Category</b> <b>Packaging</b> 30.2% of total carbon footprint
<b>Total Water Footprint per Liter</b> <b>0.15 m3</b>	<b>Water Footprint per Liter</b> <b>0.45 m3</b>	<b>Highest Contributing Process</b> <b>Beverage</b> 75% of total water footprint	<b>Highest Contributing Category</b> <b>Beverage</b> 75% of total water footprint



**Key features:**  
Track the Primary Data Share progress in your dashboard.

# PACT Methodology for Product Carbon Footprints



**1. Materials Extraction  
(Upstream)**



**2. Materials Processing  
(Upstream)**



**3. Components  
Manufacture**



**4. Product Manufacture**

Raw Materials for  
Battery Components

Raw Materials for  
Battery Pack

Raw Materials for  
Passive Cooling System

Other anode graphites and  
conductive additives

Collector

Binder

Electrode solvent

Battery chemistries for  
cathode (Li-NMC)

Lithium salt

Organic electrolyte solvent

Other electrolyte  
components

Anode Electrode  
Coating

Cathode Electrode  
Coating

Polyolefin Separator

Casing

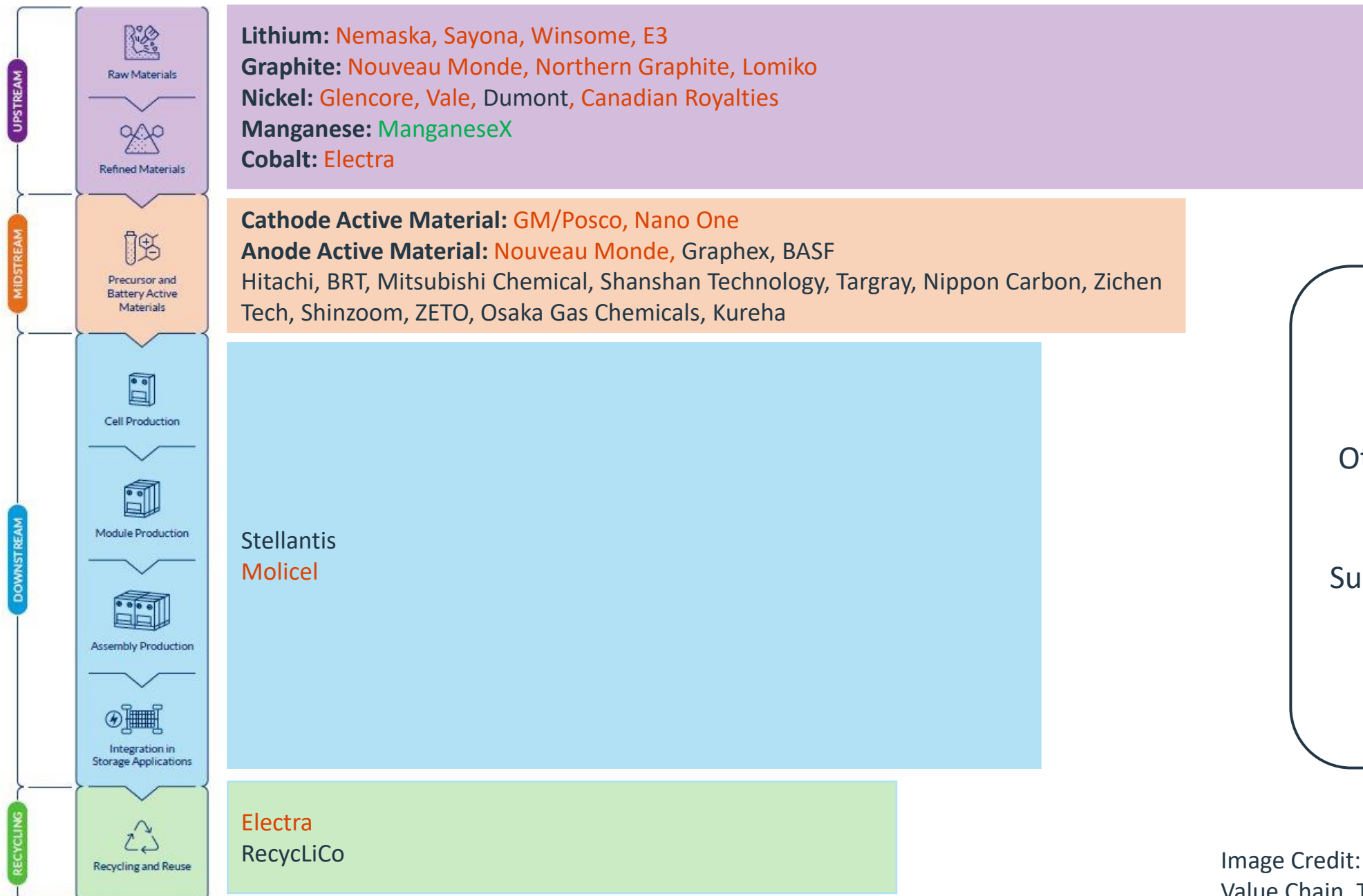
Electrolyte

Battery pack  
components

Passive cooling  
system

Lithium-ion battery cell

Lithium-ion battery pack



Other companies to be approached?

Support in engaging?



A promotional banner for an ESG webinar. The top half features a dark blue background with several glowing blue circuit board patterns. Below this, the text 'ESG WEBINAR SERIES 2/4' is prominently displayed in bold black font. Underneath, a blue rounded rectangle contains the text 'DUE DILIGENCE & PROMOTING ESG PERFORMANCE'. To the right, there are logos for BENCHMARK, SLR, NORDA STELO, and BMAC (Battery Metals Association of Canada). At the bottom left, a calendar icon indicates the date '04 DEC' and a clock icon indicates the time '9 AM PDT/12 AM EST'.

**ESG WEBINAR  
SERIES 2/4**

DUE DILIGENCE & PROMOTING ESG PERFORMANCE

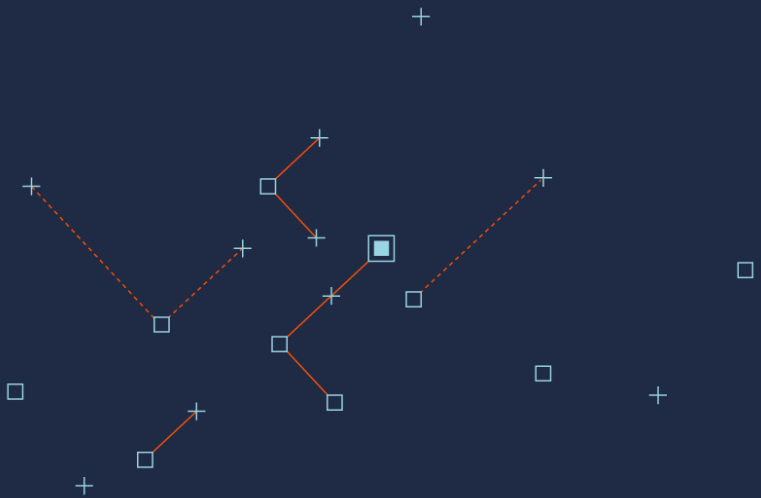
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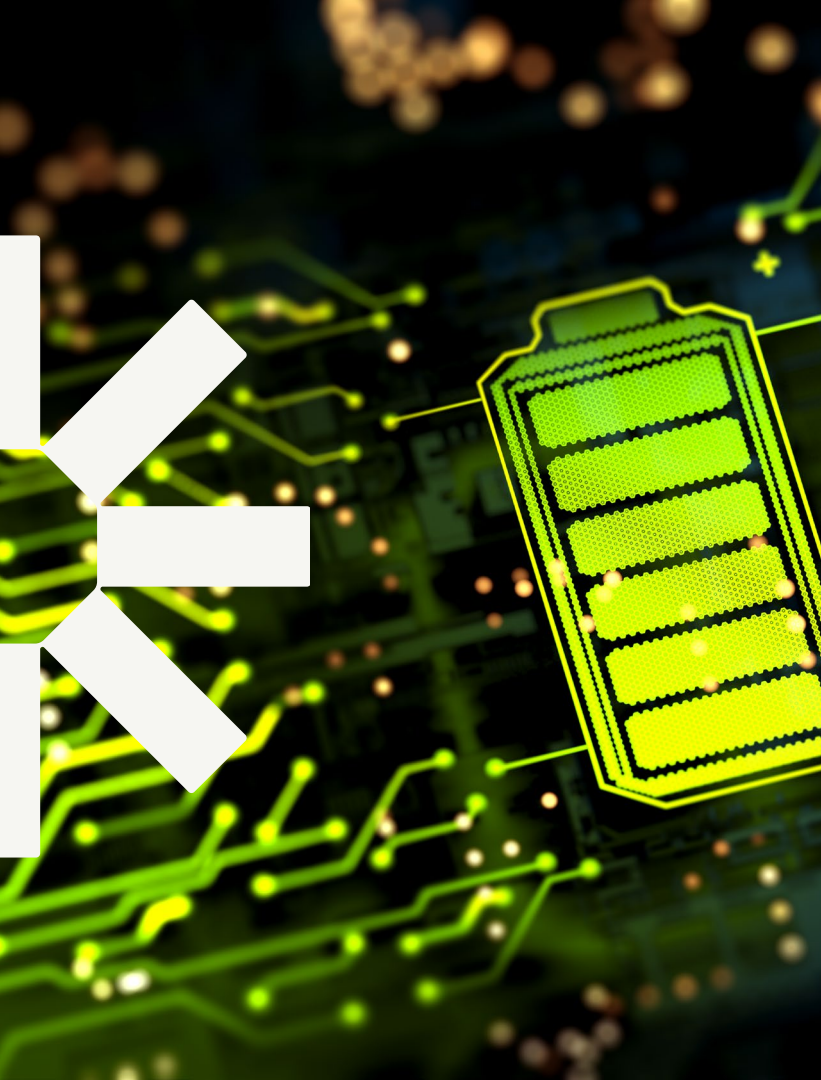
BENCHMARK  
SLR NORDA STELO  
BMAC | Battery Metals Association of Canada

## Ideas?

What ideas are there to help ensure this initiative is designed to be as impactful as possible?

How can this be designed to be compelling to supply chain actors?





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# Due Diligence and Promoting ESG Performance

**Michelle Gluck, P. Geo., EP**  
Senior ESG Consultant,  
ESG Advisory Team Lead

**Stephan Theben**  
Managing Principal,  
Mining Sector Lead

**BMAC**

Battery Metals  
Association of Canada

SLR

December 4<sup>th</sup>, 2024



# Agenda

Due Diligence and  
Promoting ESG  
Performance

01

## ESG Context & Drivers

- a) Why is ESG Important Anyway?
- b) ESG Challenges for Canadian Producers

02

## ESG in the **Canadian Mining Industry**

- a) The Canadian ESG Advantage
- b) Current Practices

03

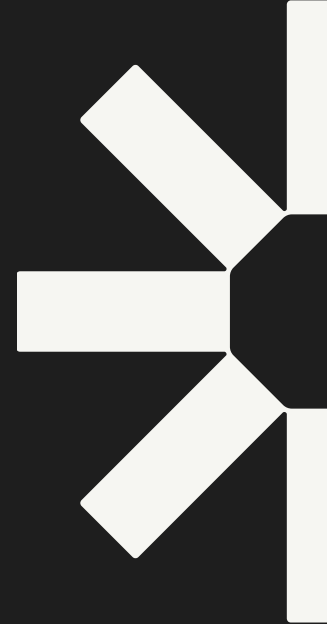
## How can Producers Demonstrate **Strong ESG Performance?**

- a) SLR's Proposed Tool
- b) Proposed Indicators
- c) Potential Applications and Benefits



# ESG Context & Drivers

- a) Why is ESG Important Anyway?
- b) ESG Challenges for Canadian Producers





# Why is ESG Important Anyway?

ESG imperatives continue to shape the future of the mining sector—**why does this matter?**

## ESG PERFORMANCE IS GROWING IN IMPORTANCE FOR INVESTORS

Investors are increasingly considering ESG factors when making investment decisions in mining and minerals processing operations

**Companies with strong ESG practices are often seen as more attractive prospects to investors**

## ESG MANAGEMENT IS GOOD RISK MANAGEMENT

Every company faces ESG-related issues, some of which are material and have the potential to cause financial or reputational damage

**Companies that do not manage these issues are at increased risk of experiencing an ESG-related incident or controversy**

## MAINTAINING COMPLIANCE IN A HEAVILY REGULATED SECTOR

The mining sector is heavily regulated. Adhering to ESG standards and frameworks helps companies comply with regulations and avoid legal issues

In addition, **ESG tracking and reporting is being increasingly required by regulations, investors, and consumers**

## STRENGTHENING COMMUNITY RELATIONS

**Strong ESG practices can improve relationships with local communities and Indigenous groups,** which is essential for maintaining a social license to operate

## PROVIDING A COMPETITIVE ADVANTAGE

**ESG is not just a regulatory requirement—it is a strategic imperative**

Companies that integrate ESG factors into their operations can enhance their resilience and competitiveness and are better positioned for long-term success



# ESG Challenges for Canadian Producers

- Stakeholders and rights holders are becoming **increasingly sophisticated in their knowledge, understanding, and expectations regarding the ESG performance of Canadian mines**
- Consumers and end users of manufactured products **now scrutinize the origins of the raw materials contained in these products** and their respective carbon footprints
- **There is now a demand for assurance** that metals and minerals are sourced in environmentally, socially, and fiscally responsible ways

Mining companies need to be **“Future Assured”**—that is, relevant, positioned, and prepared for the evolving complexities of sustainable development—**but how do these companies go about this?**



# ESG in the Canadian Mining Industry

- a) The Canadian ESG Advantage
- b) Current Practices







# The Canadian ESG Advantage

Canada has advantages that it can leverage to position itself as an ESG leader in mining

## CANADA IS A **WORLD LEADER** IN ESG STANDARDS RELATED TO MINING

Canada has robust environmental and social regulations that promote **sustainable and ethical practices** in mining, processing, and production

We are actively involved in the advancement of important initiatives that promote sustainable mining practices, such as Towards Sustainable Mining

## CANADA IS WELL-POSITIONED TO LEAD **THE ENERGY TRANSITION**

Canada has significant amounts of many of the **world's most critical minerals** and an abundance of **clean power**

In addition, we have the workers, businesses, and communities that know how to scale up the exploration, extraction, processing, manufacturing, and recycling of those critical minerals

## CANADIAN MINING COMPANIES ARE **COMMITTED TO INNOVATION**

Canadian mining companies are **adopting advanced technologies** to optimize resource use, including water recycling, energy-efficient processes, and reducing **greenhouse gas emissions**

Mining companies are increasingly including biodiversity and ecosystem protection initiatives in their operations

## CANADA PLACES A **STRONG EMPHASIS ON SOCIAL RESPONSIBILITY**

Canadian mining companies understand that the success of our critical mineral development is tied to the active participation of **local communities and Indigenous Peoples**

This is achieved by integrating diverse perspectives through ongoing and meaningful engagement, collaboration, and benefits-sharing



# Current Practices

- Canadian securities regulators require that any public disclosure of scientific and technical information regarding mineral projects **must comply with National Instrument (NI) 43-101**
- There are **numerous ESG standards and frameworks** applicable to the mining sector, both in Canada and globally
- Many companies, especially junior mining companies, are overwhelmed by the number of ESG standards and frameworks and are **often uncertain of what they should be focusing on**
- Existing ESG standards and frameworks **are largely focused on the performance of operational sites**, not sites in development or pre-operational

How can we ensure that **ESG performance is considered, evaluated, and documented as early as possible** for Canadian mining projects?



ICMM



RESPONSIBLY  
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Initiative for Responsible  
Mining Assurance

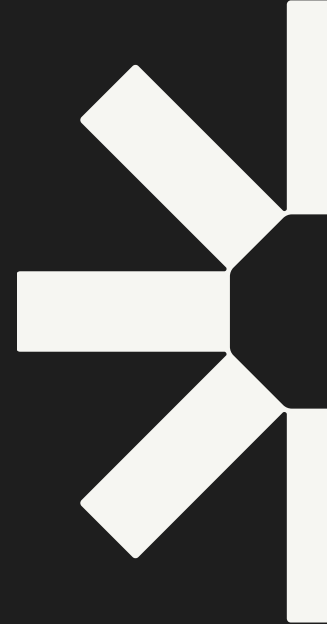


WORLD  
GOLD  
COUNCIL



# How can Producers Demonstrate Strong ESG Performance?

- a) ESG Evaluation & Guidance Tool
- b) Proposed Indicators
- c) Potential Applications and Benefits





# ESG Evaluation & Guidance Tool

- SLR has developed a tool to **assess the ESG performance of both Canadian mining projects and operational mine sites at all project stages**
- The tool will help companies evaluate their project or site's "**current state**" and provide a roadmap of how to get to its "**desired state**"—**a step-by-step tool outlining indicators that need to be achieved to get from point A to B**—taking a project from **meeting** the minimum standards to **exceeding** standards
- The tool will be applied at the project/site level, but will consider policies and commitments made at the corporate level
- ESG performance evaluated against a **standard of care for each indicator at each project stage**—that is, what are the minimum expected requirements for a particular indicator at a particular stage?



# Indicators: What's Important?

- What indicators should be evaluated to obtain a **comprehensive and relevant view of the ESG performance of a Canadian mining project or operational mine site**?
- What does the Canadian mining sector currently accept as **"best practice"**?
- Consider guidance published by **TSM, The Copper Mark, IRMA**, and others—what topics are important? Is anything missing?
- Existing standards and frameworks (e.g., TSM, The Copper Mark) intend to evaluate the **"current state"** of the target project/site
- SLR's tool intends to evaluate the **"current state"** (where the target project/site currently is) as well as the **"desired state"** (where the project/site would like to be and what is needed to get there)

SLR's tool can be thought of as a **"roadmap"** to help companies identify a mining project or mine site's starting point (A) versus its end point (B), and **identify what is needed to get from point A to B**



HOW CAN PRODUCERS DEMONSTRATE STRONG ESG PERFORMANCE?

# Proposed Indicators for Evaluation



## ENVIRONMENT

- Environmental Approvals, Permits & Policies
- Air Quality & Noise Vibration
- Climate & Greenhouse Gases (GHGs)
- Energy Management
- Water Management
- Mineral Waste Management
- Biodiversity & Protected Areas
- Non-Mineral Waste Management
- Mine Closure & Rehabilitation



## COMMUNITY

- Engagement with Interested Parties & Social License
- Archaeological & Cultural Heritage
- Land Acquisition & Resettlement



## WORKFORCE

- Human Rights
- Fair Labour & Working Conditions
- Occupational Health & Safety



## GOVERNANCE & ETHICS

- Business Ethics & Integrity
- Transparency & Disclosures
- Responsible Sourcing



## ECONOMICS

- Finance
- Revenue & Payments
- Transparency



# Potential Applications

Currently, SLR is proposing that the tool could be used in two ways: **self-evaluation** and **independent (third party)**

## SELF-EVALUATION

- A mining company can use the tool to conduct a **self-evaluation** of its **ESG performance** for a specific project or site
- Process can be used to **gain insight, inform decision-making and strategic planning**, and for **continuous improvement**
- Following completion of its self-evaluation, the mining company can—if it chooses—contact SLR for review and to verify its self-evaluation

## INDEPENDENT (THIRD PARTY)

- A mining company can contact SLR to conduct an **independent evaluation** of the **project/site against the indicators in the tool**
- Process relies on **information and documentation provided to SLR** by the mining company
- SLR evaluates the information and documentation **against the standard of care**
- Process will require minimal effort from the mining company



HOW CAN PRODUCERS DEMONSTRATE STRONG ESG PERFORMANCE?

# Potential Benefits

Why should Canadian mining companies consider using a tool like this?

**Reporting is already required, so why not take it one step further?**

Canadian mining companies are already subject to performance audits and standardized public disclosure, **so why not go one step further and use the tool to provide a more holistic snapshot of the project or site's ESG performance?**

Doing so will demonstrate a **strong commitment to ESG**, which will help to build trust with investors, consumers, and other stakeholders and rights holders

**It encourages strategic planning and continuous improvement**

The tool can be used as a **strategic planning tool** for projects and to **encourage continuous improvement** for operational sites

**Evaluating and documenting a project or site's "current state" versus its "desired state" encourages performance transparency, holds a company accountable to its commitments, and provides a clear roadmap of the steps that need to be taken for a project or site to successfully achieve its desired state**

**It allows for easy transition to existing ESG standards and frameworks once the site is operational**

Evaluating and documenting the ESG performance of a project as early as possible **will allow for easy transition to existing, more robust ESG standards and frameworks** (such as TSM and ICMM) **once the mine site is operational**





Making  
Sustainability  
Happen

SLRCONSULTING.COM



**Michelle Gluck, P. Geo., EP**  
**Senior ESG Consultant, Team Lead**

M +416 669 6213

E [mgluck@slrconsulting.com](mailto:mgluck@slrconsulting.com)



**Stephan Theben**  
**Managing Principal, Mining Sector Lead**

M +416 947 0907

E [stheben@slrconsulting.com](mailto:stheben@slrconsulting.com)