



Shape the future  
with confidence

# Top three risks and opportunities facing the battery minerals sector


■ ■ ■  
The better the question. The better the answer. The better the world works.

The battery minerals (lithium, nickel and cobalt) sector is going to be extremely volatile as it scales production to meet surging demand from the energy transition for use in energy storage and electric vehicle batteries.

According to a recent EY [report](#), the energy transition is driving long-term demand for battery minerals, but mining companies are facing several challenges in bringing reliable supply online, including:

- 1 Geopolitics: Rising government participation
- 2 Capital: Balancing capital discipline with growth
- 3 New projects: overcoming complex barriers

How can companies mitigate the impact of these risks and find opportunities amid the disruption?



## Geopolitics:

# Rising government intervention as countries seek to de-risk supply chains and create domestic value

## The risks

New governments, in the wake of the 2024 election super cycle, are shifting their focus to governing and implementing new policies. The new US administration has already withdrawn from the Paris Agreement and the likely reversal of climate incentives may result in a lower outlook for battery mineral demand. The trade tariffs on imports will likely result in reciprocal trade measures. Battery material supply and pricing are likely to be affected, particularly as

refining of these metals is concentrated in China.

The battery minerals market faces significant challenges due to low commodity prices, near-term oversupply, rising competition and market illiquidity, which makes the market highly sensitive to policy changes and tariffs. Additionally, high levels of government debt may lead to increased taxation on miners as governments seek additional revenue sources.

## The opportunities

Despite these risks, a robust outlook for battery mineral demand is driving investment in the mining and processing of battery minerals.

### ■ Capitalizing on domestic processing potential.

Governments are incentivizing in-country processing to support self-sufficiency efforts. Brazil, for example, has allocated US\$815m to support sustainable and innovative extraction and processing of battery minerals.<sup>1</sup> Saudi Arabia is also investing US\$100b to establish itself as a mineral processing centre.<sup>2</sup> The National Lithium Strategy in Chile promotes public-private partnerships to develop sustainable extraction projects, aiming to double production by 2035.<sup>3</sup>

### ■ Achieving supply chain resiliency through

**international partnerships.** Countries are entering into strategic partnerships with resource-rich nations to ensure a consistent supply of battery minerals. For instance, the UK has established a partnership

with Indonesia for mining, processing, manufacturing, and recycling of minerals to ensure security of supply.<sup>4</sup> Furthermore, countries are collaborating with national institutions to derisk investment in new projects in new geographies. India, for example, has formed a joint venture, Khanij Bidesh India Ltd. (KABIL), through its three central public sector enterprises, to explore acquisition opportunities for mineral assets in Argentina, Australia and Chile.<sup>5</sup>

- **Increasing commitment towards carbon-efficient supply chains.** Low carbon producers are pushing for a green premium. The LME declined to set a 'green' premium on nickel as the market was not yet large enough. Canada, Australia, Germany, France, Japan, the UK and the US have, however, committed to the Sustainable Critical Minerals Alliance, embracing stringent ESG mining standards.<sup>6</sup> Miners can also take advantage of markets that will reward lower carbon supply chains.



## Capital: Balancing capital discipline with growth

### The risks

Under the IEA's Net Zero Emissions Scenario, the mining industry must invest at least US\$792b by 2050 to satisfy rising demand.<sup>7</sup> During 2024, prices of major battery minerals declined by 20-25% y-o-y and mining companies are re-assessing their capital expenditure.<sup>8</sup> This coupled with the oversupply of lithium and nickel, combined with slower global economic growth, is making it difficult for miners to

secure capital. Consequently, companies are re-evaluating their expansion and investment strategies. To ensure the success of the energy transition and the journey towards net-zero emissions, it is crucial to incentivize investment in battery minerals projects. Securing capital will be critical to securing supply – and the world's transition to a new energy system.

### The opportunities

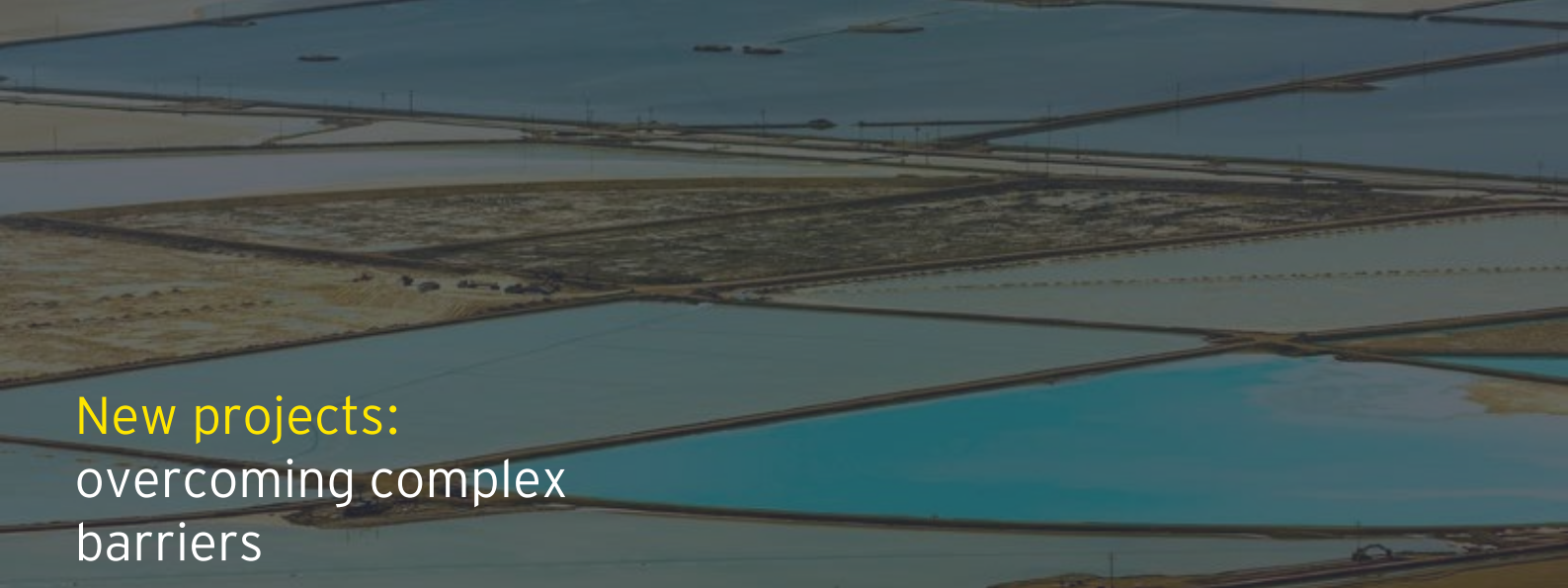
Miners are exploring alternative sources of capital to ensure ongoing development.

- **Integration along the value chain.** Miners are increasingly partnering with battery manufacturers and automotive companies through offtake agreements, joint ventures and strategic alliances. For example, Volkswagen Group's battery company, PowerCo, and Patriot Battery Metals entered into a strategic partnership to jointly develop the Shaakichiwaanaan Project and a lithium conversion facility.<sup>9</sup>
- **New business models.** Miners are collaborating with adjacent industries for mutual benefit. Major oil and gas players are diversifying into the battery value chain

through collaboration with prominent players. For example, Saudi Aramco has a joint venture with Maaden to extract lithium and advance direct lithium extraction (DLE) technologies.<sup>10</sup>

- **Accelerate growth through mergers and acquisition.** Major players are focusing on acquiring energy transition minerals, while smaller companies are targeting early-stage projects with high potential. Rio Tinto to acquire Arcadium Lithium for approximately US\$6.7b, as part of its strategy to be a global leader in lithium production. It will integrate the diverse assets, geographical footprint and financial strength of both companies into a standalone unit – Rio Tinto Lithium.<sup>11</sup>





## New projects: overcoming complex barriers

### The risks

New projects are being developed differently. ESG considerations are front of mind, with a greater focus on sustainability and local consultation. Obtaining a License to Operate requires engaging a diverse array of stakeholders, including government authorities, industry groups and local communities, often all with differing expectations. Miners

are experiencing long delays to obtain permits, navigate overlapping red tape from different authorities and mitigate litigation risks. Inflation, lower ore grades and access to infrastructure mean the capital intensity of projects is increasing. Higher taxes and royalties are an additional barrier.<sup>12</sup>

### The opportunities

- **Invest into emerging technologies:** Mining companies are embracing technology to make battery minerals extraction safer and more efficient. Pilbara Minerals, for example, has set up the world's largest lithium ore sorting plant using TOMRA Mining's sensor-based sorting technology that enhances lithium recovery and energy-efficient processing.<sup>13</sup> Direct Lithium Extraction (DLE) is significantly boosting lithium recovery rates from 40-60% to 70-90%, unlocking previously untapped sources like geothermal brines and reducing land and water usage compared to traditional methods.<sup>14</sup> For instance, Volt Lithium achieved a 90% lithium recovery rate at lower concentrations of 34 mg/L at its pilot project in Alberta, Canada.<sup>15</sup>
- **Implementing digital in capital project design:** Essential tools for optimizing capital projects, such as Building Information Modeling (BIM) and Advanced Work Packaging (AWP), have changed the way new projects are being conceived. In our experience,
  - BIM enhances collaboration, improves design accuracy by up to 20%.
  - AWP increases productivity by better planning reducing overruns by 15%, ensuring smoother project execution.
- **Modularization strengthens these benefits** by using off-site construction package, which improve time by up to 15%. This approach enhances flexibility, facilitates larger projects to be built timely and cost-effectively, reducing waste and environmental impact. Despite requiring careful planning and logistics, modularization significantly boosts efficiency and competitiveness in the sector.
- **Explore new mining frontiers:** There is an inflow of fresh capital from emerging regions such as MENA. For example, Titan Lithium is investing over US\$1b to develop a lithium processing facility in the UAE's Khalifa Economic Zone, positioning it as a pivotal hub for minerals processing.<sup>16</sup> Emerging space technologies that identify and monitor mineral deposits on Earth can also open new business opportunities.
- **Accelerate approvals:** As governments investment in the energy transition increases, mining companies can explore potential incentives and work closely with the government to establish clear and efficient regulations for advancing battery mineral projects.



The longer-term outlook remains robust as the energy transition accelerates.

Despite current low prices and rising production costs posing short-term challenges, the sector is embracing new opportunities to build sustainable supply. This positions it as a key player in the global move towards a greener, more resilient future.

**What do you see as the biggest risks and opportunities for the battery minerals sector in 2025?**

Join the conversation by leaving a comment below.

This publication contains information in summary form and is therefore intended for general guidance only. It is not intended to be a substitute for detailed research or the exercise of professional judgment. Member firms of the global EY organization cannot accept responsibility for loss to any person relying on this article.

1 "Brazil Invests \$815 Million to Transform Global Strategic Minerals Market", Discovery Alert, January 2025, accessed 2 February 2025

2 "Saudi Arabia reveals \$100 billion mining investment", CNBC, January 2025, accessed 2 February 2025

3 "The future of electric vehicles and lithium demand in Chile," InvestChile Blog, accessed 3 February 2025

4 "Critical Minerals: UK - Indonesia memorandum of understanding", UK Government, November 2024, accessed 2 February 2025

5 "KABIL is exploring opportunities for acquisition of overseas critical minerals assets in Argentina, Australia and Chile", Press Information Bureau - Government of India, July 2024, accessed 2 February 2025

6 "Australia's push for higher ESG standards in critical minerals industry," Mining Technology, accessed 3 February 2025

7 Global Critical Minerals Outlook 2024," IEA, May 2024, accessed 29 January 2025

8 EY analysis of S&P Market Intelligence data

9 "Volkswagen and PowerCo Make Strategic Investment in North American Lithium Company Patriot Battery Metals", Volkswagen Group, December 2024, accessed 2 February 2025

10 "Aramco plans transition minerals JV with Ma'aden", Saudi Aramco, January 2025, accessed 2 February 2025

11 "Rio Tinto to acquire Arcadium Lithium", Rio Tinto, December 2024, accessed 2 February 2025

12 EY analysis of S&P Market Intelligence data

13 "TOMRA Mining's advanced sorting technology used in the world's largest lithium ore sorting plant at Pilbara Minerals' Pilgangoora Operation", Company website, January 2025, accessed 2 February 2025

14 "Direct lithium extraction: is the hype justified by the reality?," Wood Mackenzie, accessed 2 February 2025

15 "Volt Lithium achieves 90% recovery at pilot project," Mining Magazine, accessed 2 February 2025

16 "Titan Lithium to set up lithium processing plant in UAE," Global Mining Review, accessed 2 February 2025

# How EY's Global Mining & Metals team can help you

The transition to a low-carbon future demands that mining and metals companies reshape their role in what will be a new energy world. Bolder strategies that embrace digital innovation can help overcome productivity and cost pressures, create long-term value and secure a stronger LTO. EY's Global Mining & Metals team brings together the breadth of experience and talent needed to approach the entire transformation process. By considering four key pillars of change – structure and culture, customers, technology, and skills and capabilities – we can help you adapt for today and reap the opportunities of tomorrow. And together we can build a better working world.

## EY contacts

### EY Global Mining & Metals Leader

Paul Mitchell  
[paul.mitchell@au.ey.com](mailto:paul.mitchell@au.ey.com)

### EY Americas and Canada Mining and Metals Leader

Theo Yameogo  
[theo.yameogo@ca.ey.com](mailto:theo.yameogo@ca.ey.com)

### EY EMEA and UKI Mining and Metals Leader

Lee Downham  
[lee.downham@uk.ey.com](mailto:lee.downham@uk.ey.com)

### China and Mongolia

Libby Zhong  
[libby.zhong@cn.ey.com](mailto:libby.zhong@cn.ey.com)

### Brazil

Afonso Sartorio  
[afonso.sartorio@br.ey.com](mailto:afonso.sartorio@br.ey.com)

### Africa

Wickus Botha  
[wickus.botha@za.ey.com](mailto:wickus.botha@za.ey.com)

### Japan

Andrew Cowell  
[andrew.cowell@jp.ey.com](mailto:andrew.cowell@jp.ey.com)

### Chile

Alicia Dominguez Varas  
[alicia.dominguez@cl.ey.com](mailto:alicia.dominguez@cl.ey.com)

### India

Vikram Mehta  
[vikram.mehta@srb.in](mailto:vikram.mehta@srb.in)

### Oceania

Michael Rundus  
[michael.rundus@au.ey.com](mailto:michael.rundus@au.ey.com)

### United States

Kaki Giauque  
[kaki.giauque@ey.com](mailto:kaki.giauque@ey.com)

### Nordics

Magnus Ellström  
[magnus.ellstrom@parthenon.ey.com](mailto:magnus.ellstrom@parthenon.ey.com)

## EY | Building a better working world

EY is building a better working world by creating new value for clients, people, society and the planet, while building trust in capital markets.

Enabled by data, AI and advanced technology, EY teams help clients shape the future with confidence and develop answers for the most pressing issues of today and tomorrow.

EY teams work across a full spectrum of services in assurance, consulting, tax, strategy and transactions. Fueled by sector insights, a globally connected, multidisciplinary network and diverse ecosystem partners, EY teams can provide services in more than 150 countries and territories.

## All in to shape the future with confidence.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. Information about how EY collects and uses personal data and a description of the rights individuals have under data protection legislation are available via [ey.com/privacy](https://ey.com/privacy). EY member firms do not practice law where prohibited by local laws. For more information about our organization, please visit [ey.com](https://ey.com).

### How EY's Global Mining & Metals team can help you

The transition to a low-carbon future demands that mining and metals companies reshape their role in what will be a new energy world. Bolder strategies that embrace digital innovation can help overcome productivity and cost pressures, create long-term value and secure a stronger LTO. EY's Global Mining & Metals team brings together the breadth of experience and talent needed to approach the entire transformation process. By considering four key pillars of change – structure and culture, customers, technology, and skills and capabilities – we can help you adapt for today and reap the opportunities of tomorrow. And together we can build a better working world.

The views of the third parties set out in this publication are not necessarily the views of the global EY organization or its member firms. Moreover, they should be seen in the context of the time they were made.

© 2025 EYGM Limited.  
All Rights Reserved.

BMC Agency  
GA 164505

EYG no. 003036-25-AUNZ  
ED None

This material has been prepared for general informational purposes only and is not intended to be relied upon as accounting, tax, legal or other professional advice. Please refer to your advisors for specific advice.

[ey.com/miningmetals](https://ey.com/miningmetals)