

GREEN AMBITIONS AND RAW REALITIES:

Can we really fund the
energy transition?



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Marlow Global Big Picture Series:

This report is the first in a series looking at the geopolitical challenges and opportunities we face this century.





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EXECUTIVE SUMMARY

The race to secure and process critical minerals has generated interest beyond the industrial and extractives sectors, dominating headlines and raising awareness of their importance both to global security and to reducing our reliance on fossil fuels. This should be a significant opportunity to redesign the relationships between producing nations, the extractives industry, manufacturers, the tech sector and consumers. Done right, a well-designed industrial policy could reset the trajectory on both fronts.

However, a year on from the flurry of national policy initiatives aimed at stimulating the global clean energy markets, we are not much closer to securing the critical minerals needed for the green transition. While we note new bilateral partnerships around critical minerals, we are at the same time seeing collaboration, partnership and trust erode between nations and regions. This is leading to increased protectionism over the exploration, development, export, and ownership of these minerals, making it harder to attract significant capital to the upstream market. This report seeks to understand why.

To some extent, the decades-long under-investment into critical minerals exploration and the recent urgency to secure supply chains are two sides of the same coin. The Western world shied away from mining in the 1980s and 1990s as it sought to distance itself from an embattled extractives sector and the polluting consequences of refining and production. In exchange for access to OECD markets, it handed over production and manufacturing of most goods, including metals and minerals, to China, leaving the Red Dragon to march ahead. Today, estimates suggest that China is responsible for 90 percent of rare earth elements and dominates global mineral processing.

The West is scrambling to catch up, with varying degrees of success. Rising geopolitical tensions with China and the undeniable effects of climate change have propelled governments and communities into action, with multiple incentive packages, “friend shoring” agreements and new industrial policies.

It may therefore come as a surprise that critical minerals experts and mining companies are shaking their heads in despair. It should be an open market for critical minerals. The supply and demand are well-documented and yet few believe that the mines, supply chains and the technical expertise needed to extract and produce materials like copper, cobalt, lithium, nickel and rare earths, will be set up in time. Not all initiatives are backed by serious intent or knowledge to create a





coherent industrial and mineral policy. There are growing concerns about supply shortages, despite continuing massive Chinese investment.

The reasons are manifold. Exploration is a risky business, with long investment horizons from exploration to commercially viable production, often in politically unstable regions. Once the minerals are discovered, mining companies often have to contend with political, economic, and regulatory instability that make their investments uncommercial or impossible to manage.

Coupled with mining's mixed reputation, there are fewer incentives for Western funds to choose mining exploration over other investments. It is left to specialist investors and funds, the mining operators and forward-looking sovereign wealth funds such as Saudi Arabia's PIF – Ma'aden joint venture, who are willing to understand and take on the risks of exploration and mining. That could explain why despite the massive array of state incentives from the US, EU and others, upstream investment hardly gets a look in. The incentives in the OECD are not compelling enough, compared to the returns from the oil and gas industries.

The cyclical boom and bust narrative of the extractives sector has scarred many investors alongside the ever-increasing geopolitical volatility that has affected prices. Mining though is a high-risk waiting game. And with the industry's social and environmental past record, which needed major correction, investors and governments have looked to more lucrative investments. Since the arrival of a more disciplined approach to understanding, managing, and sharing above ground risks through the ESG frameworks, the industry has been cleaning up its act. Whether it is sustainable mining, domestic beneficiation, supply chain governance or decarbonisation, most mining companies now place ESG at the top of their priority lists.

However, the industry's reputation remains poor. Resource-rich countries, sitting on huge deposits of critical minerals, do not see mining companies as true commercial partners. Fuelled by popular anger that the benefits of the resources have not reached communities, mining companies are often targeted by governments. They are also convenient punching bags when politicians seek to deflect from their own failures to deliver for their people.

Nowhere seems to be immune. Over the past year, Namibia, Mexico, Chile, and Indonesia have imposed export controls over their minerals. Canada has clamped down on Chinese investment, leaving many mining companies listed on the Toronto exchange exposed.





Political risk guarantees are insufficient to protect against political interference or resource nationalism. International arbitration typically takes eight to ten years to resolve disputes. The WTO regime has lost its clout. And the convergence of the green transition agenda with national security has complicated the investment and operating upstream environment.

As critical minerals become a strategic priority for countries all over the world, there needs to be greater alignment between private and public partners. If investment fails to flow to exploration and development, there might not be enough minerals to power the green economy or meet national security requirements which have grown since the outbreak of the war in Ukraine. Unless we are willing to engage in serious discussions about demand management and downsizing the global economy by reducing consumption and growth, something needs to shift in the way we finance the green transition.





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INTRODUCTION

Critical minerals have once again become a priority for the international community, due to a confluence of environmental, energy security and national defence-related concerns. Economies, environmentalists, and armies need the same minerals to power fighter-jets, semi-conductors, wind turbines, solar panels, and electric cars. This perfect storm of demand creates the potential for big winners, but equally big losers. The competition is zero-sum.

This is not the first time that national security and critical minerals have converged. In the First World War, the US government published its first critical minerals classification.¹ There were only five on the list – tin, nickel, platinum, nitrates and potash. Today, there are over 30 critical minerals.

During the twentieth century, war continued to be a driver in determining which minerals and industries were critical. It also led to the development of a robust, domestic mining sector, particularly in the US. According to Jordy Lee at the Colorado School of Mines,² Congress passed the Defense Production Act during the Korean War, to regulate steel and mining, and once again during the Cold War to establish the aluminium and titanium industries.³

However, with the collapse of the Soviet Union and the rise of globalisation, the need for self-sufficiency seemed to disappear. Alongside the growing awareness of the environmental and social consequences of mining, many countries were happy to divest from their own industries and allow others, particularly China, to take on the bulk of mining and production.

China's success at exploiting its first-mover advantage gained by moving into mineral-rich jurisdictions – particularly in Africa – when no one else wanted to engage, has put it years ahead of its Western competitors. It now dominates every stage of the CRM supply chain. Importantly, the People's Republic's long-term industrial policy has strengthened its manufacturing capabilities, allowing

1 CSIRO, resourceful, Issue 27, Critical Minerals. <https://www.csiro.au/en/work-with-us/industries/mining-resources/resourceful-magazine/issue-27/history-of-critical-minerals>

2 Calderon, Jordy Lee, "How Critical Minerals became so critical", Milken Institute Review, 31 October 2022. <https://www.milkenreview.org/articles/how-critical-minerals-became-so-critical>

3 This was later reinforced with the Mining and Minerals Policy Act of 1970 and the National Critical Materials Act of 1984.

national companies to exploit domestic critical mineral reserves as well as those overseas.⁴

The Covid-19 pandemic and the invasion of Ukraine by Russia have fast-tracked these developments and exposed the fragility of mineral (and other) supply chains. These events have reminded the global community that countries can and do weaponise commodities, including CRM, to serve their own political, geopolitical, and economic agendas. While Moscow restricted its supply of hydrocarbons and grain against rival countries after the invasion, Beijing imposed CRM export bans to exercise leverage over other governments.

The last two decades have seen a remarkable shift in this dynamic. While Japan has stockpiled important minerals since the 1970s, it was the Chinese decision to cut off rare earth minerals in 2010 that prompted the country to diversify its supply of minerals and develop new technologies. Today, Japan has embarked on a critical minerals diplomacy tour of Africa, most recently signing a deal with Namibia in August 2023 for rare earth minerals.⁵ US is similarly engaged in joint ventures, including the most recent reports of a US-Saudi Arabia partnership to secure metals from Africa.⁶

Countries everywhere are now moving – albeit at different paces – to diversify their supply chains away from China and secure more reliable access to critical minerals supplies. The US Inflation Reduction Act of August 2022 and the EU Critical Raw Materials Act of March 2022 are just two examples of recent policy initiatives in this space.

The problem, as ever, is money. While many stakeholders argue that policy interventions by governments are necessary to enhance the growth of the CRM sector, progress is moving slowly and without the optimal level of support to encourage financing. Whether sufficient streams of non-Chinese capital will flow into CRM projects over the coming months, years and decades remains an open question.

4 Nakano, J. (2021) “The Geopolitics of Critical Minerals Supply Chains”. https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/210311_Nakano_Critical_Minerals.pdf?VersionId=DR03x5jlrwLnNjmPDD3SZjEkGEZFEcgt

5 Japan signs deal with Namibia to explore rare earth minerals, Reuters, August 8, 2023. <https://www.reuters.com/markets/commodities/japan-signs-deal-with-namibia-explore-rare-earth-minerals-2023-08-08/>

6 U.S., Saudi Arabia in Talks to Secure Metals for EVs. <https://www.wsj.com/world/middle-east/u-s-saudi-arabia-in-talks-to-secure-metals-for-evs-9719f5>



Coupled with finding investment are the political and commercial risks facing mining operators and investors as they look to explore for minerals and set up new mines. Experience teaches that Western governments and the international rules-based order are slow to intervene to stem political instability and resource nationalism.

Faced with an escalating climate emergency, China's perceived strategic threat, and an ongoing war in Ukraine, the question for the West is what can it do to mitigate these risks?



THE CRITICAL MINERALS LIST

The following raw materials listed in Annex II of the EU Critical Raw Materials Act* are widely accepted to be critical minerals:

1. Antimony
2. Arsenic
3. Bauxite
4. Baryte
5. Beryllium
6. Bismuth
7. Boron
8. Cobalt
9. Coking Coal
10. Copper
11. Feldspar
12. Fluorspar
13. Gallium
14. Germanium
15. Hafnium
16. Helium
17. Heavy Rare Earth Elements
18. Light Rare Earth Elements
19. Lithium
20. Magnesium
21. Manganese
22. Natural Graphite
23. Nickel – battery grade
24. Niobium
25. Phosphate rock
26. Phosphorus
27. Platinum Group Metals
28. Scandium
29. Silicon metal
30. Strontium
31. Tantalum
32. Titanium metal
33. Tungsten
34. Vanadium

* Proposal for a Regulation of the European Parliament and of the Council Establishing A Framework For Ensuring A Secure And Sustainable Supply Of Critical Raw Materials And Amending Regulations (Eu) 168/2013, (Eu) 2018/858, 2018/1724 And (Eu) 2019/1020. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX_percent3A52023PC0160

SECTION 1:

POLITICAL RISK

KEY TAKEAWAYS

- ▶ The primary burden of managing multinational, national and subnational political risk in the CRM mining space falls squarely on mining companies and their shareholders. If governments want to secure a predictable, long-term strategic supply of critical minerals that is not dependent on China then they must help shoulder or partially offset the heavy load carried by mining companies.
- ▶ Resource nationalism and protectionism are an ongoing feature of the extractives sector. Balancing the need for foreign investment and skills with domestic beneficiation, commercial or otherwise, is a difficult tightrope for resource-rich nations to walk. This often leads to popular discontent and political retaliation against investors.
- ▶ Managing political instability and public protests present sometimes impossible challenges for CRM mining companies. Serbia revoked licences for Rio Tinto's lithium project (where it had no equity stake), ostensibly in response to community-led mobilisation. Such large projects are essential if Europe is to expand its independent supply of critical minerals. At the same time, it granted Chinese-owned Zijin acquisition rights to Serbia's, and Europe's, largest copper mine and smelter. Western CRM mining companies must also contend with the risk that pro-investor administrations will be replaced by regimes that are hostile to their interests.
- ▶ A greater number of CRM-rich jurisdictions are likely to impose export controls on their raw ores over the coming years in a bid to capture more value from these minerals and stimulate domestic industrialisation and beneficiation. While Indonesia is embroiled in a WTO dispute with the EU over its ban on nickel-ore, other jurisdictions consider Jakarta's drive to expand in-country processing to be a model to emulate.
- ▶ The threat that foreign mining interests will be fully or partially nationalised or hit by negative regulatory reforms will likewise persist. The examples of Chile and Mexico are instructive, with mining investors in these countries facing considerable uncertainty. Aggressive, anti-private mining sector reforms in Mexico will make it more difficult for operators to raise finance.
- ▶ While intended to protect national interests, actions by OECD member states can unintentionally make it more difficult for mining companies to successfully exploit critical mineral reserves as planned. Informal mining is sometimes an easier route to reduce costs and maximise profits for some operators and regions.



INVESTORS CARRY THE FULL BURDEN OF POLITICAL RISK

The cost of managing above ground risks for mining companies is often equal to or exceeds below-ground risks. This is for the primary reason that minerals are often found in politically unstable and challenging environments in which the risk of state intervention⁷ (which harms the interests of investors) tends to be high.

To date, the burden of managing these risks, and the consequences for when these risks materialise, is carried exclusively by operating investors and their shareholders. The unintended consequence is that if a Western mining company is hamstrung in its commercial endeavour, significant investment will fail to flow – and the intention to reduce reliance on CRM supplies from China will fail to materialise as Chinese companies move in to fill the void.


Even if the money existed to invest, and the regulatory frameworks to incentivise investment were improved (see subsequent sections), mining companies would still face a range of ever-present risks in CRM-rich jurisdictions where political risk is elevated. They can be subjected to an overwhelming burden of pressures from political, economic, and regulatory instability, which make their investments uncommercial or impossible to manage. Such instability is largely driven by weak public governance and rule of law, which allow for significant pendulum swings and/or unpredictable government interventions. While companies are becoming disciplined in identifying and assessing ESG risks, they have been less successful in managing corporate affairs risks.

Over the decades we have seen retaliatory behaviour from host governments which has led to:

- exaggerated or fabricated tax bills;
- state-forced confiscation of a company's assets and/or property;
- the introduction of draconian legislation to “legalise” the confiscation;
- intimidation of employees of the company which in some cases includes imprisonment on made-up civil and criminal charges;
- intimidatory violence at the mine site, or in other public places against the company or its employees;

⁷ According to Peter Leon “the issue here for the West is that most of them (CRMS) are located in developing countries where governments tend to be more interventionist.”



- 
- preventing senior employees or executives from traveling based on manufactured criminal charges;
 - cancellation of visas/prevention of entry to the country targeting key company officials which might also prevent their ability to protect their assets;
 - manufactured ESG claims (especially environmental) against a company; and
 - aggressive media campaigning both in country and internationally, designed to agitate activist shareholders.

RESOURCE NATIONALISM AND PROTECTIONISM

The ESG movement (see Section 4) should be welcomed as a corrective factor to the exploitation and damage that some foreign mining companies have caused in resource-rich environments. Once standards are universally agreed, they should set expectations of how companies should behave, hold them to account and attempt to repair the mistakes of the past.

One of the biggest issues has been the economic benefits afforded to the host nation. Aly-Khan Satchu believes that it will be hard “for a foreign-owned company to own 100 percent of a product or an asset ever again”. Governments are rightly looking for an equitable share in projects.

It is when those demands for an equitable stake become needlessly restrictive on productions or returns, that the call for equity and fairness shift to resource nationalism and protectionism.

Olivia Lazard flags the risk of the ‘resource curse’ and calls for the need for there to be a unified understanding of what positive iterations of protectionism can do to benefit developing nations as they look to better capitalise on their domestic resources. Ultimately what we should be looking for is well-governed resource development.

Anton Mifsud-Bonnici believes that it is alarmist to raise red flags about rising protectionism and resource nationalism. He argues that all countries should be nationalistic up to a certain point. That’s the premise of the nation state. Where this becomes problematic is when it is exploited to distract from domestic political issues, provide cover for corruption, halt efficiency, development or trade, or when resource nationalism is weaponised as a political tool to reinforce an unaccountable exercise of political power and undemocratic processes.

As many jurisdictions, particularly in Africa, are disproportionately reliant on export revenues from extractives, the balancing act between the need for foreign investment and skills, and domestic beneficiation, becomes ever more difficult for politicians seeking [re]election.

COPING WITH CIVIL UNREST AND POLITICAL INSTABILITY


Managing political instability and disruptive protests over the long lifecycle of mining projects (which can take decades) will remain an ongoing challenge for CRM mining companies. The adverse impact of regular, disruptive protests has been especially evident in Peru. Over the course of 2022 and 2023 Las Bambas copper mine, owned by MMG,⁸ has had deliveries to and from its site in Peru's mountainous south disrupted on a large scale by roadblocks. The company was not able to transport an average of 25,000 tonnes of copper production per month during periods of suspension between February 2022 to February 2023. At the end of this period, Las Bambas' management announced that the mine was in 'care and maintenance mode,' which is in effect an enforced suspension of operations.

A concoction of political and socio-economic factors has accounted for the disruptive unrest around Las Bambas and other mines in the south.⁹ One important trigger was the removal from office of former President Pedro Castillo in December 2022 after he tried to shutter congress and rule by decree. Castillo's departure was particularly contentious in the copper-blessed south, given his profile as a champion of poor indigenous and farming communities, and his criticism of large extractive companies. Road blockages and violence have been driven by a sense that surrounding communities have not benefited from mining activities, expecting employment and compensation for dust and noise pollution.

Serbia presents another example of public mobilisation against a foreign mining company linked to critical minerals. In January 2022, the Serbian government cancelled the spatial plan for Rio Tinto's Jadar lithium-borates project and revoked its related licences. The move followed weeks of national protests – including in Belgrade – against the project over concerns related to the potential environmental and social impacts of mining lithium. Critics of the Jadar lithium-borates project

8 MMG is majority owned by China Minmetals

9 Peru's copper mine Antamina, which is co-owned by Glencore, BHP, Teck Resources Ltd and Mitsubishi Corp, has also been adversely affected by protest action along roads. It was attacked by protestors in January 2023. Freeport-McMoRan's copper mine has also been affected by protest action.



have focused on the government's lack of transparency on extractive and other projects, and its poor track record of regulating industry.

At a strategic and operational level, CRM mining companies cannot ignore the risk that pro-investor or benign governments will be replaced by regimes that are hostile to investors. This risk is most apparent in Francophone Africa, which has witnessed more coups or attempted coups than any other region in the world over recent years. Only one (namely Myanmar in 2021) of 18 coups recorded across the world since 2017 took place outside of Africa.

These coups draw attention to the possibility of sudden regime change in countries that suffer from any combination of the following: weak governance, rival political factions, abuse of power, corruption, and extreme inequality. Often the coups are initially welcomed as a response to the growing public exasperation towards the elites in power. However, as access to resources shift from one elite group to another, nothing changes. The West must not be complicit by rewarding poorly governed regimes in resource-rich jurisdictions. Instead, the global community should invest in winning hearts and minds on the street, by clamping down on corruption and boosting governance and democracy.

THE SPECTRE OF NATIONALISATION AND DAMAGING REGULATORY REFORM

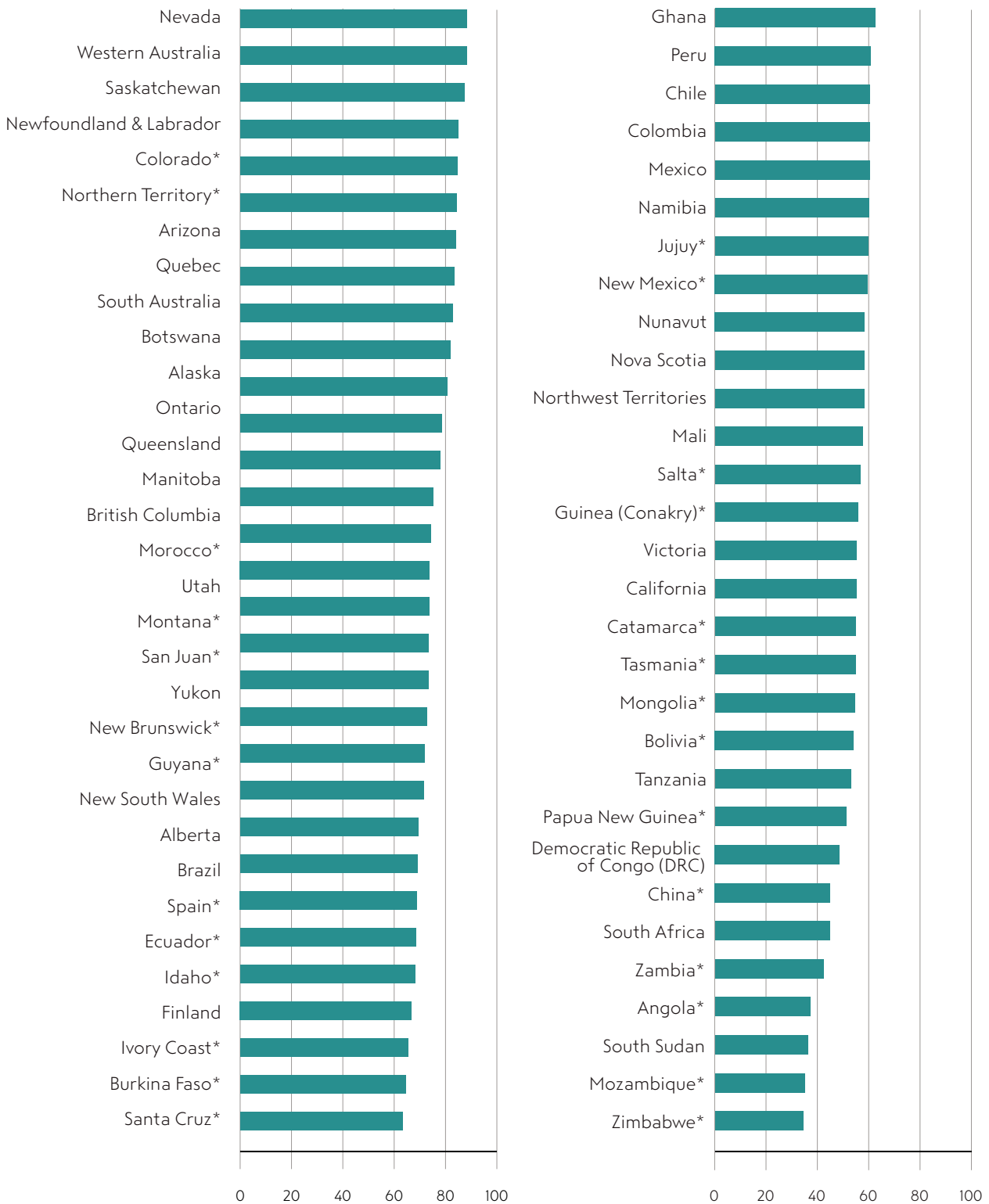
Nationalisation or semi-nationalisation of private interests constitutes another risk in certain CRM jurisdictions, not least Chile and Mexico. In April 2023, Chile's president, Gabriel Boric, announced that he would nationalise his country's lithium industry.¹⁰ While not terminating current contracts, the government intends to hand greater control of two large lithium mines controlled by lithium heavyweights Albemarle and SQM to the state mining company prior to the expiry of their contracts.¹¹ Chile's strong resource nationalism tilt has come on the back of the Mexican President Obrador's announcement in April 2022 that he would nationalise the country's lithium reserves. While the Mexican government intends to take a controlling stake in new joint ventures, existing mining concessions held by almost 12 foreign companies are under review.

¹⁰ Chile is the world's second largest producer of lithium.

¹¹ Chile's president has said that new lithium contracts would only be issued as public-private partnership, with projects controlled by the state. The president says nationalisation of lithium assets is intended to help Chile become a developed economy, for better wealth distribution and to protect the environment.



Figure 1: Investment attractiveness index

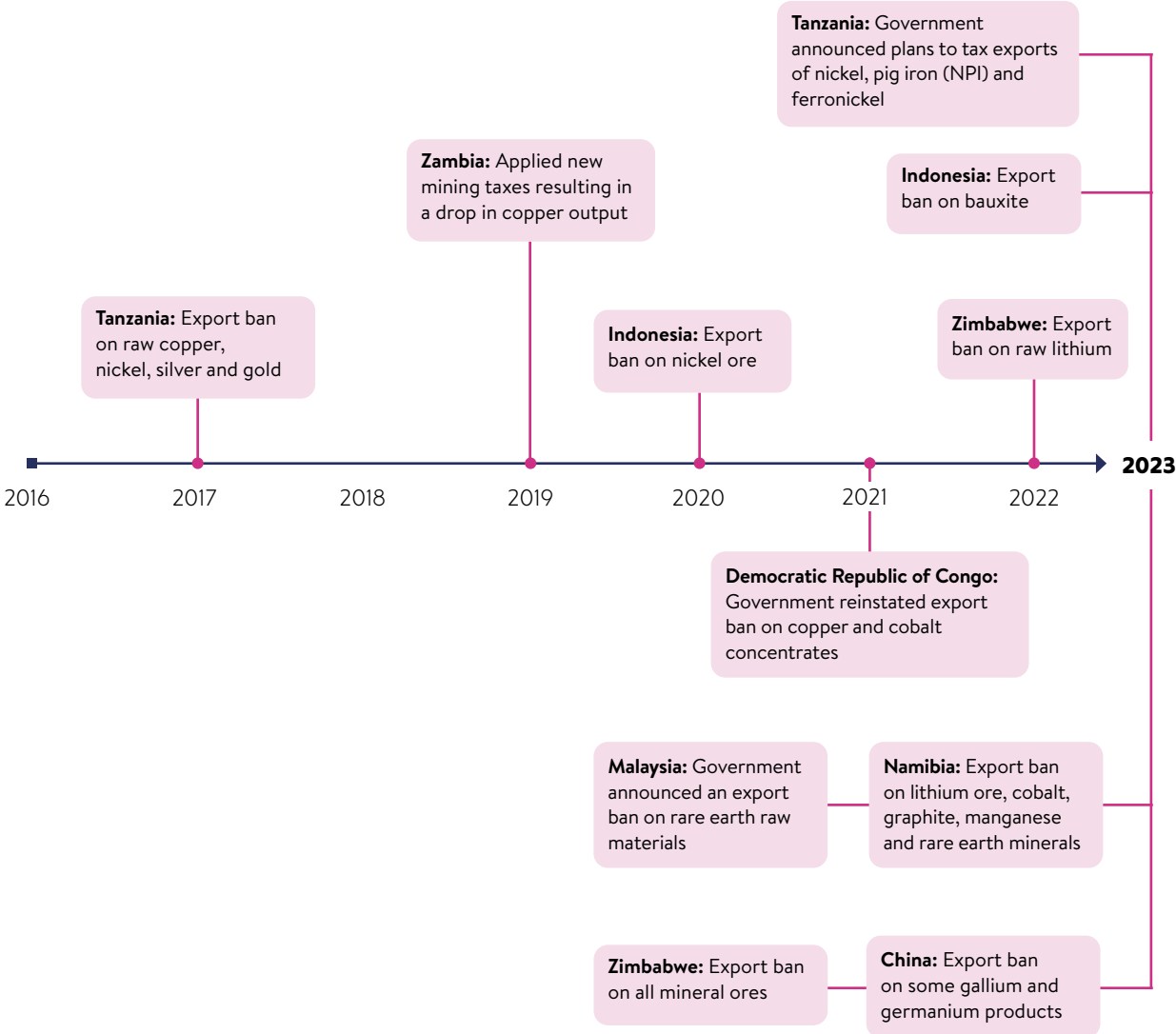


* Between 5 and 9 responses

Source: Fraser Institute Annual Survey of Mining Companies 2022.



Figure 2: Timeline of selected export bans and taxes



Mexico doubles as a leading contemporary example of multi-dimensional, negative regulatory reform being propelled by a populist president.¹² In addition to Obrador’s nationalisation drive, the president has shortened mining concession renewals from 50 to 25 years, restricted water use provisions, and limited rights to exploit certain minerals in mining concession areas. A regulatory reform that requires exploration activities to be conducted by the underfunded state-run Mexican Geological Service is particularly problematic for international mining companies, making it more difficult for them to secure finance. While entirely legitimate moves, taken together, they create an uncertain and difficult regulatory and investment climate for mining companies.

¹² President Obrador has criticised mining magnates for tax dodging and causing water stress.

Many officials in Africa's resource-rich countries are following developments in Latin America, and particularly in the immediate neighbourhood, with interest. The government of DRC is currently reviewing all its joint ventures with foreign investors. Robert Lukama, the head of DRC's state-owned Gécamines has indicated that the government wants to derive more value – in the form of beneficiation, revenue, and jobs – from mining contracts. It is unclear to what extent jurisdictions in sub-Saharan Africa and beyond have learned the lessons from the extreme form of resource nationalism applied by Zambia's former President Edgar Lungu (2015–2021), whose policies caused immense damage to the Zambian economy, leading it to become the first African country to default at the end of 2020. Despite new political leadership, Zambia is still dealing with the fallout.

EXPORT CONTROLS A THORN IN THE SIDE OF MINING COMPANIES

Export controls and full bans on the export of raw critical mineral ores are among the biggest challenges for mining companies and their financiers. The monetary disruption costs of having to cease exports from host countries and develop local processing facilities (whether independently or in partnership), can be immense and have the potential to undermine the best-laid business plans.

The reality is that most mining companies will negotiate with the host nation and come to an agreement or take legal action. US mining company Freeport-McMoRan is one example of a company which has extensive experience in such negotiations.¹³ Legal action and negotiations still consume time and resources, while perpetuating uncertainty. This is especially the case for mid-cap and smaller mining entities with fewer financial resources to tap.

The export controls trend is unlikely to subside over the coming months and years as CRM-rich jurisdictions seek to capture more of the value of their minerals through beneficiation. Their objective is to generate greater economic growth and more jobs often when demand for mineral commodities and prices are high, or when national elections are looming.¹⁴

13 Timothy Foden said that US mining company Freeport appears to negotiate with the Indonesian authorities – which try to shift the regulatory or business playing field on the company – every few years. “They make concessions and get back to business.”

14 Some governments which are still struggling to replenish their coffers in the aftermath of COVID-19 consider export bans on raw critical minerals as a legitimate way to boost government revenues.

Indonesia stands out as the trailblazer for other CRM-endowed countries.¹⁵ Since imposing a ban on the export of nickel ore in 2020¹⁶ and requiring businesses to purify or process the mineral domestically, the country has attracted USD billions-worth of foreign direct investment to nickel processing.¹⁷ This has caused Jakarta to expand the export ban to five other raw materials, albeit in a phased in fashion.¹⁸

Other countries have followed suit.¹⁹ In addition to the above-mentioned Tanzania, the list includes Zimbabwe (raw lithium and base mineral ores, December 2022) and Namibia (lithium ore, cobalt, graphite, manganese and rare earth minerals, June 2023). Namibia's decision came as a particular shock for mining investors. "The country was about as safe an investment destination you could get. Now people are spooked," Timothy Foden said. Mining companies with operations in other CRM-rich jurisdictions now wonder whether they will eventually be subjected to similar raw mineral export bans.

CRM CARTELS AND MINERAL SUBSTITUTION AS SOURCES OF UNCERTAINTY

Though discredited, talk of the potential establishment of critical mineral cartels to control prices is another source of uncertainty for upstream, midstream, and downstream CRM investors. An initiative by the governments of Bolivia, Chile and Argentina to explore the formation of an OPEC-type lithium cartel in Latin America is the chief example of cartel talk.²⁰ Critics point out that the cartel would fail on the basis that lithium has yet to become a major commodity like oil, and

15 Indonesia's success is qualified. Jakarta has been challenged by the EU at the WTO. The EU won an initial hearing, though Indonesia appealed the verdict. The Indonesian government has unsuccessfully argued that its export ban involves "an internal requirement regulating the sale and processing of nickel ore, rather than a border measure regulating the 'exportation ... of [a] product'".

16 Indonesia had imposed an export ban in 2014, which it partially reversed, only to reinstate a full ban in 2020. The government announced in 2022 that it would tax the export of nickel pig iron (NPI) and ferronickel.

17 The majority of this investment has come from China.

18 'Indonesia relaxes June export ban for five raw materials,' Nikkei, 24 May 2023. <https://asia.nikkei.com/Business/Materials/Indonesia-relaxes-June-exports-ban-for-five-raw-minerals>

19 Namibia and Zimbabwe have until now not been deterred by the threat of trade partners imposing reciprocal tariff suspensions and or other retaliatory measures in response to export bans on unprocessed minerals. These measures could be imposed in cases when the offending WTO member (in this case Namibia and Zimbabwe) refuses to comply with WTO rulings. Leon, P and Rachwal, N, "Beware pitfalls of resource nationalism: lessons from Indonesia", Business Day 10 August 2023. <https://www.businesslive.co.za/bd/opinion/2023-08-10-peter-leon-and-natasha-rachwal-beware-pitfalls-of-resource-nationalism-lessons-from-indonesia/>

20 As another example, the Indonesian government says it is exploring the possibility of forming a nickel cartel.

that Latin America's share of total production is expected to diminish over the coming decades as mineral extraction elsewhere gathers momentum. The foreign capital required to propel production will also flow to markets where the risk of nationalisation or semi-nationalisation is remote.

There is a risk that fledgling cartels will be formed and then fall flat.²¹ In an August 2023 article, the *Financial Times* cited John Baffes, head of the Commodities Unit at the World Bank, saying: "You may have some countries that come together, to create an environment that may be beneficial to them, such as keeping prices high...But that will be the seeds of failure, because more entities will come in, from outside of the group."²²

CRM-producing countries that would like to develop a cartel and companies that produce or process the same critical mineral face a common, inherent threat. This being that their critical mineral will eventually be substituted with alternatives. The risk of this is currently weak. However, the threat of substitution may become more pronounced in the future. Back in November 2022, Bosch and IBM announced that they were entering a partnership to deploy simulation technology and quantum computing to identify alternatives to critical minerals and rare earths.²³ While intended to reduce dependency on certain critical minerals, and the geographies where they are located, this kind of research has added another layer of uncertainty for companies and financiers looking at long-term investments.


A MATTER OF NATIONAL SECURITY BUT AT A COST FOR BUSINESS PARTNERS

Governments' use of national security concerns and their need to protect critical minerals supply chains as a justification to bar investments from specific countries might be the final straw. Canada stands out here, given its long-standing, but now debatable, reputation for having predictable national regulations. In November 2022, the Canadian government announced that it had ordered the divestitures of three Chinese investments in publicly traded Canadian mining companies. This

21 Bolivia, Chile and Argentina have been exploring the possibility of establishing a lithium cartel – inspired by OPEC – since July 2022. They reportedly want to also include Brazil and Mexico.

22 "The new commodity superpowers", *Financial Times*, 8 August 2023. <https://www.ft.com/content/0d2fba79-940f-4a28-8f4f-68f1e755200f>

23 'Bosch, IBM join forces to seek substitute critical minerals,' *Reuters*, 9 November 2022. <https://www.reuters.com/technology/germanys-bosch-partners-with-ibm-quantum-computing-2022-11-09/>



was based on national security review provisions in the Investment Canada Act.²⁴ The unprecedented decision starkly highlights how the scope of Canada's national security review process goes well beyond conventional defence and territorial matters to absorb strategic sectors of the economy.

While intended to protect Canada's national interests, the divestitures have been a source of disruption – of varying duration and intensity – for the Chinese companies' Canadian partners: Power Metals Corp, Ultra Lithium Inc and Lithium Chile.²⁵ Power Metals Corp managed to replace its Chinese shareholder less than a month after the divestiture order, while Lithium Chile announced a shareholder replacement in February 2023. Ultra Lithium was less fortunate, however. It was forced to sell its Verde lithium brine project in Argentina to Australia's Power Metals Ltd in exchange for a stake in the Australian company. Ultra Lithium says it would have been in a stronger position had Zangge Mining Investment not been forced to divest, given the technological expertise of the Chinese company.

Although each Canadian company survived the ordeal, Canada's reputation for having a predictable and stable regulatory environment has taken a blow. This has not been aided by a call in January by Dean McPherson, the head of business development for mining at the Toronto Stock Exchange, for the Canadian government to do more to help the Canadian companies plug the capital they had lost from the Chinese divestitures.

It is not just restrictions on foreign ownership that challenges mining operators and investors. New OECD supply-chain legislation and green taxonomies, designed to improve environmental and social standards, also limit investments and boost the informal mining sector as a way to cut costs and maximise profits. Anton Mifsud-Bonnici says that the rising demand for minerals has already unleashed a massive informal mining industry whose beneficiary owners not only frequently disregard basic safety, the environment and human rights, but erode public governance through organised corruption and criminalised violence. We should be mindful of the unintended consequences of new legislation.

²⁴ Sinomine (Hong Kong) Rare Metals Resources Co., Limited (Sinomine) had to divest its interests in Power Metals Corp (Power Metals) while Zangge Mining Investment (Chengdu) Co., Ltd. (Zangge) was required to divest its interests Ultra Lithium Inc (Ultra Lithium). Chengze Lithium International Limited (Chengze) was required to divest its interests Lithium Chile Inc (Lithium Chile).

²⁵ These JV projects were fortunately at early stages of exploration at the time of the Canadian government's decision.



LOOKING AHEAD

Mining companies have few supporting props to shoulder the full weight of political risk around the world. “Political risk insurance policies are in my experience useless,” according to Timothy Foden. “It is shockingly expensive. It can amount to USD 1m a year and many mining companies don’t take it out.” This might be an area in which Western governments can intervene – providing political risk insurance at a highly subsidised cost (or free) which might have the flow-on effect of potentially liable governments exercising their influence over a host state acting improperly. This could take the form of guarantees or lenders of last resort.

At the same time, Western policymakers have so far failed to adopt policies that provide a political risk safety net for CRM mining companies, their shareholders, and their financiers. This is a particular challenge for companies that are willing to take a risk by sinking capital in countries that are inherently volatile or unpredictable. More conservative, risk-averse mining companies would have more inclination to contemplate jurisdictions where political risk is inherently more acute if they enjoyed more support from their governments. The question is whether the West could or should support these risky endeavours.



SECTION 2: THE CHALLENGE OF FINANCE

KEY TAKEAWAYS

- ▶ It is far from certain whether sufficient capital will be made available to fund the number of upstream, midstream and downstream CRM projects required to reduce dependency on China and meet the needs of the energy transition. Investments into mining, refining and smelting will need to rise by up to USD 4trn by 2030, which is between approximately USD 300bn and USD 400bn per year.²⁶
- ▶ Financing has been constrained by the absence of a universally applied risk framework and universally applied performance standards to allow financiers to compare projects. The mining industry's uneven social and environmental track record also makes easing regulations for developments more complicated. This is a particular problem in high-risk, CRM-rich jurisdictions.
- ▶ Inadequate communication between mining companies and their potential sources of finance has exacerbated uncertainty over the viability of potential CRM projects. Money tends not to flow to areas where risks are poorly understood, and therefore hard to manage.
- ▶ The increased flow of private equity since 2020 marks a positive dynamic in the CRM sector.²⁷ This coincides with growing interest from automakers, equipment manufacturers and battery cell producers, several of whom are investing in the critical minerals value chain.
- ▶ Private finance, supported by financial government incentives, is unlikely to be enough to propel the CRM sector at a rate that will meet global demands. What is needed is a highly coordinated approach between private finance and consistent government funding, against a positive policy backdrop. Investment strategies need to be connected across the entire CRM value chain.

²⁶ “The net-zero materials transition: Implications for global supply chains” McKinsey and Company, 5 July 2023. See link: <https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-net-zero-materials-transition-implications-for-global-supply-chains>

²⁷ “Private equity funds emerging as major financiers for critical mineral projects: CMA” S&P Global Commodity Insights, 8 July 2022. <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/070822-private-equity-funds-emerging-as-major-financiers-for-critical-mineral-projects-cma>

SETTING THE SCENE

The global push to develop clean energy technologies amid rising environmental pressures has led to a spike in the demand for critical minerals. IEA data shows that global demand for lithium, cobalt and nickel jumped by 300 percent, 70 percent and 40 percent respectively between 2017 and 2022.²⁸ Investment in energy transition minerals and development jumped 30 percent last year alone, following a 20 percent bump in 2021, according to the IEA.²⁹

The growing need for critical minerals has been met with a jump in financing for miners. Between 2017 and 2022, green bonds rose from USD 150bn to USD 450bn. Green bonds are expected to spike another 30 percent in 2023.³⁰ The boost in funding has coupled with a growth in market capitalisation of the top 40 miners, from USD 400bn in 2003 to USD 1.2trn in 2022.³¹

While investment in critical minerals is expanding, there is a significant risk that it will fail to keep up with expanding demand over the coming decades. A range of challenges – including potential supply chain disruptions, project delays and the adoption of export restrictions in host countries – additionally threatens to hold up production, processing and refining activities. Patrick Schröder warns that growing global demand for some critical minerals such as cobalt and nickel could outpace the available supply by as early as 2030.


This potential shortfall in supply is not due to a lack of critical mineral reserves across the world. The risk derives from the highly fragmented nature of the CRM ecosystem – a reality that has restricted sources of financing and restrained the development of the sector. The lack of a comprehensive risk framework available to financiers and investors, uncertainty about how to measure and manage ESG risks, the legal and reputational backlash of getting those risks wrong, and complex or incomplete regulatory environments are some of the main factors that have held the sector back (see Section 4).

28 “Critical Minerals Market Review 2023”, IEA, 2023. <https://www.iea.org/reports/critical-minerals-market-review-2023>, License: CC BY 4.0

29 *Ibid.*

30 “Mine 2023: 20th edition the era of reinvention” PWC, June 2023. <https://www.pwc.com/gx/en/industries/energy-utilities-resources/publications/mine.html#critical-minerals>

31 *Ibid.*



Risk and market volatility have pushed investors to seek out safer investments, driving a surge in the price of precious metal prices, such as gold.³² Addressing the security concerns relating to the political and geopolitical risk associated with the sector is necessary to mitigate market fluctuation and drive investment. Investments into mining, refining and smelting will need to increase by up to USD 4trn by 2030 to meet global demand.³³

UNIVERSALLY APPLIED FRAMEWORK AND STANDARDS NEEDED TO ENCOURAGE FINANCING

The absence of a universally applied risk framework in the CRM sector and a limited understanding of the global CRM landscape are two of the primary factors that have discouraged commercial financing of mining projects.³⁴ The Democratic Republic of Congo (DRC) is a good example. Though sitting on the world's largest proven cobalt reserves, many Western mining companies and financiers have over previous years hesitated to touch the country due to its weak governance profile, accompanying scope for reputation damage and poor road and power infrastructure. Admittedly, the number of opportunities available to Western investors in the DRC has been limited by China's dominance of the market.

State intervention and price volatility are classified as other key concerns for financiers. Mining companies can have the rug pulled from beneath their feet if host governments decide to impose export restrictions as Zimbabwe, Namibia and Indonesia have done on unprocessed raw mineral exports (see Section 3). Offtake pricing volatility likewise remains a source of uncertainty for potential investors and financiers.

Another key challenge is the lack of a single, universally applied performance standard to allow financiers to compare projects against one another. Many potential and actual financiers depend on the Equator Principles and International Finance Corporation's Performance Standards to manage social and environmental

³² "Risk and opportunities for mining" KPGM Global Outlook 2021. <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2021/03/risk-and-opportunities-for-mining-2021-report.pdf>

³³ *Ibid.*

³⁴ Increased demand for critical minerals will drive a significant number of new projects and help propel the expansion of existing projects. With that comes a greater spectrum of risk, explain Jo Feldman and Lisa Koch. The lack of a universally applied risk framework will be felt even more starkly as the West seeks to ramp up its access to CRM supplies.

risks for individual projects.³⁵ Their task is complicated by the fact that it is the mining companies that decide which mining standards they report against when looking to secure finance.

A lack of dialogue between mining companies and potential sources of finance is another challenge that has perpetuated uncertainty over the viability of CRM mining projects. Mining and refining are often poorly understood by institutional investors, and innovative technologies are often subject to insurance premiums despite their promises of more efficient and 'greener' outcomes. Money tends not to flow to areas where risk and opportunities are poorly quantified and communicated. Olimpia Pilch makes the point that the lack of honest dialogue between mining companies and investors makes it challenging to shift negative perceptions of the sector.

Efforts to improve transparency and accountability in the sector have at least partly been undermined by what Jamie Strauss refers to as a legacy of failed risk management within the mining sector. Single tragic events – such as the 2019 collapse of a tailings dam attached to an iron ore mine in Brazil which killed 270 people – continue to haunt the sector.

Financing from the oil and gas (O&G) sector could help plug the capital deficit that characterises CRM development. However, significant investment is unlikely to come from O&G majors given the above-mentioned range of challenges. O&G companies have, to date, refrained from investing heavily in exploiting, processing and refining CRM. The CRM business case is not compelling enough for O&G companies to contemplate shifting away from hydrocarbons.³⁶

O&G executives are not convinced that the return on CRM investment will eclipse the return from hydrocarbons. Oil and gas still account for 55 percent of world energy consumption, with entire industries and economies dependent on the industry.³⁷ Ludivine Wouters makes the point that the payback time on a mining venture can be up to a decade; a timeframe that O&G company shareholders, like most investors, are typically less than enthused about.

35 As with the mining sector at large, sustainability-linked bonds – which have yet to really take off in the mining sector – do not have an established, universally accepted set of key performance indicators.

36 “Oil and gas majors step up efforts to diversify into lithium” Financial Times, 25 June 2023. <https://www.ft.com/content/7616a9f4-e0db-4d61-b189-9e81ddd8137b?sharetype=gift>

37 “Five ways oil and gas can lead the race to decarbonization” EY Americas, 6 December 2022. https://www.ey.com/en_us/oil-gas/five-ways-oil-and-gas-can-lead-the-race-to-decarbonization



Nonetheless, over the past two years, majors have made incremental incursions into the CRM sector. Notably, ExxonMobil acquired a second lithium project in Arkansas to the tune of USD 100m this summer. Norway's Equinor secured a stake in developer Lithium de France back in 2021.

CRMS ATTRACTING THE MOST INTEREST

Certain CRMs are attracting more investment than others. Minerals used in the construction of batteries for electric vehicles (EV) – including lithium, cobalt and nickel, among others³⁸ – are driving much of the activity and investment in the CRM market. A report from the International Energy Agency posits that the emergence of electric vehicle (EV) batteries will account for up to half of the rise in demand for clean energy technology minerals over the next two decades.

Geopolitical pressures, defence and energy security concerns have meanwhile placed certain minerals into the spending spotlight. Uranium stands out for experiencing a 60 percent jump in financing in 2022 amid renewed appetite for nuclear power due to uncertainty over Russian energy supplies and the drive by the West to reduce their reliance on Russian oil and gas as the conflict in Ukraine drags on.³⁹ The war in Ukraine has exposed the fragility of supply chains and highlighted the necessity of critical minerals for defence and national security purposes. The war has also depleted military stockpiles. We are likely to see NATO members compete with EV manufacturers in the race for key minerals.

LANDSCAPE FOR CRM FINANCING IS SHIFTING

Fresh sources of funding are emerging for critical minerals. A February 2021 article by McKinsey & Company claims that alternative financing options could pour approximately USD 800bn into the mining sector over the next ten years.⁴⁰ The flow of private equity into CRM development is increasing as traditional bank

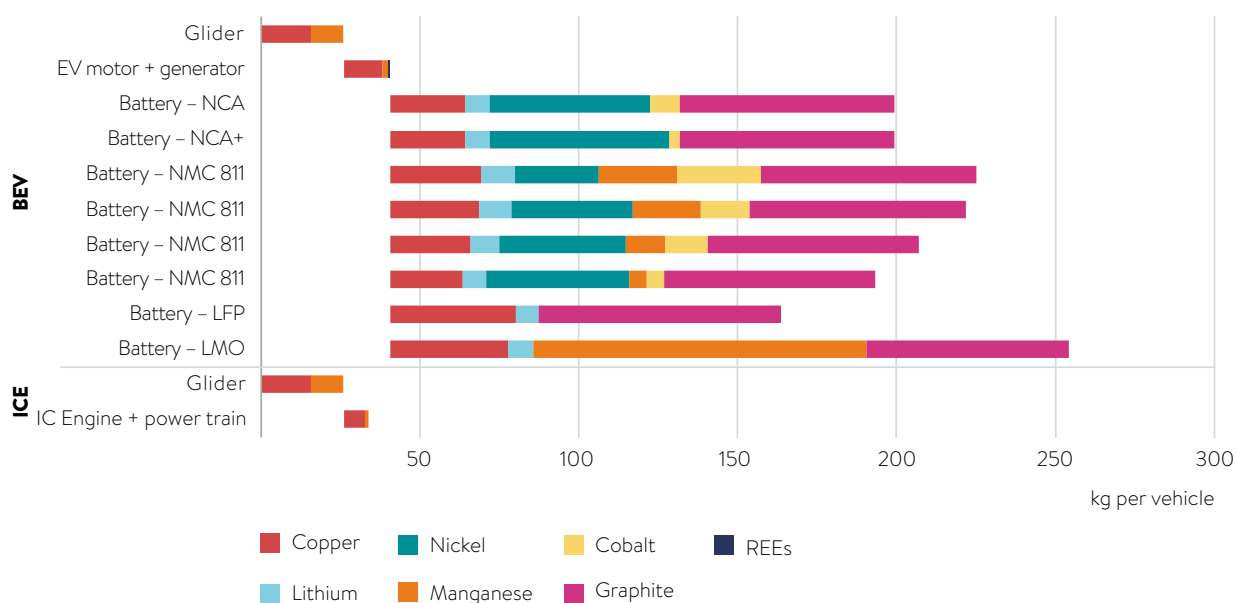
38 The minerals comprising an EV battery include aluminium, cobalt, lithium, manganese and nickel. According to a study conducted by the World Bank, the demand for these minerals could rise by over 450 percent by 2050, if green technology is deployed on a scale consistent with the Paris Climate Agreement.

39 "Critical Minerals Market Review 2023", IEA, 2023. <https://www.iea.org/reports/critical-minerals-market-review-2023>, License: CC BY 4.0

40 "Alternative financing in mining" McKinsey & Company, 24 February 2021. <https://www.mckinsey.com/industries/metals-and-mining/our-insights/alternative-financing-in-mining>



Figure 3: EVs use around six times more minerals than conventional vehicles



Note: For this figure, the EV motor is a permanent magnet synchronous motor (neodymium iron boron [NdFeB]); the battery is 75 kilowatt hours (kWh) with graphite anodes.

Source: The Role of Critical Minerals in Clean Energy Transitions, IEA.

financiers shy away from financing CRM projects due to risk concerns associated with the sector.⁴¹ However, the relatively short PE funds’ investment windows might struggle to account for the mining’s long ROI timeframes.


Despite this, as of 2021, more than 200 UK and international private equity and venture capital funds boasting⁴² more than USD 3.4trn in assets under management joined the UN Principles for Responsible Investment backed Initiative Climate International (iCI). The iCI fosters the engagement between private equity and venture capital firms and encourages their commitment to meeting climate-related targets.⁴³ One notable example comes from the Brazilian mining giant Vale,

41 “Private equity funds emerging as major financiers for critical mineral projects: CMA” S&P Global Commodity Insights, 8 July 2022. <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/070822-private-equity-funds-emerging-as-major-financiers-for-critical-mineral-projects-cma>

42 “Vale creates \$100 million venture capital arm to spur mining innovation” Mining.com, 8 June 2022. <https://www.mining.com/web/vale-launches-100m-venture-capital-initiative-to-invest-in-startups/>

43 “The path to Net Zero and the role of private equity and venture capital” BVCA, Accessed 16 August 2023.





which in June 2022 created Vale Ventures, a venture capital initiative valued at USD 100m launched to back mining start-ups. US based Resource Capital Funds' pitch to raise USD 250m for a new fund to finance mining companies is another.⁴⁴

Traders have likewise shown an appetite to finance CRM development, while automakers, equipment manufacturers and battery cell producers are increasingly investing in the critical minerals value chain. Take electric car manufacturer Tesla's plan to construct a new lithium refinery in the United States, or General Motors' investment in Lithium Americas (to the tune of USD 650m).

There has also been a surge in M&A transactions related to CRM and clean technologies, such as BHP's acquisition of OZ Minerals in May 2023, valued at USD 6.4bn. According to financial analysis conducted by PwC, copper was M&A's darling commodity in 2022, making up 85 percent of all CRM transactions and 56 percent of activity by Top 40 miners.⁴⁵ There has also been a bump in funding raised by critical minerals start-ups, which raked in a record USD 1.6bn in 2022, according to the IEA.⁴⁶ Interestingly, Rio Tinto's increased its ownership of Turquoise Resources in December 2022 from 51 percent to 100 percent for approximately USD 3.1bn.⁴⁷ This may indicate that mining companies are willing to take on more risk.

Public sector support for CRM projects is meanwhile increasing. Lisa Koch and Jo Feldman explain that critical minerals projects that might otherwise have been more difficult to finance may now be more likely to attract public sector support in the form of tax credits, grants, loans, or guarantees. This may help 'de-risk' (reduce the risk exposure) for projects and allow them to more easily attract commercial finance. Lower interest rates on government borrowings may also explain the jump in public sector funding for mining projects.

Private finance is on its own unlikely to be enough to propel the CRM sector strongly forward at a rate that will meet global, or Western, needs for decades to come. A combination of strong private finance, consistent government incentives

<https://www.bvca.co.uk/Our-Industry/ESG-and-Responsible-Investment/The-path-to-Net-Zero>

⁴⁴ "Resources Capital Funds Seeks \$250 Million for Mining Bets" WSJ Private Equity, 23 February 2023. <https://www.wsj.com/articles/resource-capital-funds-seeks-250-million-for-mining-bets-3661ff99>

⁴⁵ "Mine 2023 The era of reinvention" PwC, 2023. <https://www.pwc.com/gx/en/industries/energy-utilities-resources/publications/mine.html#financial-analysis>

⁴⁶ "Critical Minerals Market Review 2023", IEA, 2023. <https://www.iea.org/reports/critical-minerals-market-review-2023>, License: CC BY 4.0

⁴⁷ Rio Tinto prevails in USD3.3bn takeover of Turquoise Hill" Financial Times, 9 December 2022. <https://www.ft.com/content/953a78c7-5656-466c-80e0-a9f978ffb0c6>



all sitting within a positive policy and regulatory environment is required to support the development of the CRM sector.

Investments by sovereign wealth funds (SVF) into the mining sector are on the rise. Saudi Arabia's Public Investment Fund's (PIF) decision to sign an agreement forming a joint venture (JV) with Saudi-owned mining company Ma'aden, Manara Minerals, in January 2023 is one notable example. In July of the same year, it was reported that Manara Minerals would invest in Vale's base metals unit to the healthy sum of USD 3.4bn.⁴⁸ This is not the first instance of government-backed funds shifting towards clean energy projects. In June 2019, Norway's Government Pension Fund Global announced a divestment of USD 13bn from fossil fuel and coal.⁴⁹ Additionally, the European Raw Materials Fund, aimed at investment in critical minerals, was launched in June 2022 with a starting amount of USD 2.1bn.

The trend of sovereign wealth funds investing in mining projects may indicate a willingness to take on more risk than, say, private financiers. In August 2023, Barrick Gold CEO Mark Bristow openly slammed Western fund managers, such as BlackRock and Vanguard, for their "myopic" approach to investment which prioritises quick returns. Bristow cites PIF as an example to follow for its big-picture approach and readiness to fork out on seemingly risky ventures.⁵⁰

While there has been an increase in public sector support and government intervention to propel CRM development, challenging or fragmented regulatory and political environments threaten to undermine the industry. The US for one has proposed ambitious legislation in the form of the Inflation Reduction Act (IRA), which targets clean energy development, among other initiatives. However, Paul Kolbe notes that the policy's climate-related goals risk being swallowed by domestic political battles and partisan gridlock. Australia faces its own regulatory roadblocks, says Joel Coward, who cites delays found in the permitting and approvals process for mining projects.

48 "Vale sells 13 percent of its base metals unit for \$3.4bn" Mining Weekly, 28 July 2023. <https://www.miningweekly.com/article/vale-sells-13-of-its-base-metals-unit-for-34bn-2023-07-28>

49 "World's biggest sovereign wealth fund to ditch fossil fuels" The Guardian, 12 June 2019. <https://www.theguardian.com/business/2019/jun/12/worlds-biggest-sovereign-wealth-fund-to-ditch-fossil-fuels>

50 "Barrick chief slams 'myopic' western funds for focusing on quick returns" Financial Times, 15 August 2023. <https://www.ft.com/content/f7dd81b4-9d82-4856-bc91-f554487292d0>



OUTLOOK FOR THE CRM INVESTMENT SPACE

As private investors and government policymakers work (with varying degrees of effort and success) to develop or encourage the development of the critical minerals sector, the outlook for private capital remains uncertain. Few of the experts interviewed for this report are optimistic that financing will expand at the rate that is required to meet future demand. This is a real challenge for the industry, which has more limited financial capacity than most policy shapers and stakeholders realise: as of July 2023, the 100 largest mining stocks have a combined market capitalisation of USD 1.8trn, whereas Apple boasts a sturdy USD 3trn.⁵¹

Recent developments however have demonstrated promising cases of increased equity flow into the CRM sector. In August 2023 it was reported that TechMet, a US government-backed mining start-up had raised USD 200m in capital to accelerate the development of critical minerals projects. TechMet is on course to reach a valuation of over USD 1bn.⁵² Plotlogic, an Australian mining startup raised USD 28m in venture capital funding in July 2023, aimed at expansion in North America and Indonesia.⁵³ In another show of financing support, the UK Infrastructure Bank announced, in August 2023, an equity investment of approximately USD 30m in Cornish Lithium, a UK-based mineral exploration start-up. Cornish Lithium also received an investment of USD 7m from existing shareholder TechMet, raising its total influx of investment to USD 30m.⁵⁴

51 “Apple’s Market Cap is Higher Than the 100 Largest Mining Stocks Combined” Seeking Alpha, 23 July 2023. <https://seekingalpha.com/article/4619005-apple-market-cap-higher-than-100-largest-mining-stocks-combined>

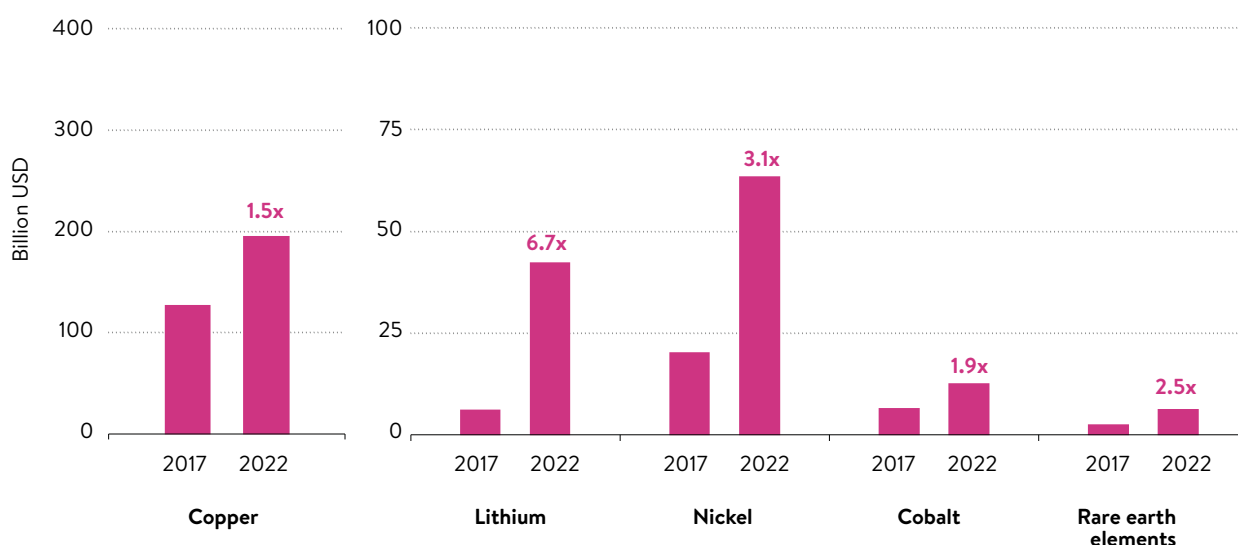
52 “US government-backed start-up on course to become mining unicorn” Financial Times, 15 August 2023. <https://www.ft.com/content/ea5f290f-eb90-4fe5-b76b-f7762299206f>

53 “Mining Tech Startup Raises \$28 Million Amid Critical Minerals Rush” Wall Street Journal, 30 July 2023. <https://www.wsj.com/articles/mining-tech-startup-raises-28-million-amid-critical-minerals-rush-96226c65>

54 “Bank invests to strengthen domestic lithium supply chain and boost Cornish economy” UK Infrastructure Bank, 8 August 2023. <https://www.ukib.org.uk/news/bank-invests-strengthen-domestic-lithium-supply-chain-and-boost-cornish-economy>



Figure 4: Market size for key energy transition minerals



Note: The market size for nickel includes both Class 1 (battery grade) and Class 2 nickel.

Source: Critical Minerals Market Review 2023, IEA. Analysis based on S&P Global.

We may see some positive shifts over the coming years – shifts that would help financiers get a better understanding of CRM mining risk. The adoption of the Initiative for Responsible Mining Assurance (IRMA) – Ready Standard, which covers exploration and development, by more mining companies could positively move the needle.⁵⁵

Uncoordinated initiatives are unlikely to be enough to turbo-charge the sector, however. Ensuring a consistent, strong flow of capital into CRM development and exploration will require a course correction in how investors and policymakers envision the transition to a mineral-led economy. Stronger, coordinated measures need to be put in place by both the private sector and governments to better understand, measure and manage the multiple risks associated with the development of the CRM sector.

⁵⁵ Anglo American, Business and Human Rights Resource Centre. <https://www.business-humanrights-org/en/companies/anglo-american/>





LOOKING AHEAD

It is understood that in the current climate, private finance alone will not be sufficient to propel the CRM agenda forward at a strong enough pace. What is needed is a combination of private funding and government intervention, existing within a robust policy apparatus that is designed to support the development of the CRM sector.

However, there is still a question mark hanging over the missing capital required to manage the energy transition. Securing the financing needed for CRM development will require a rewrite of the political and environmental risks associated with the sector. If we see an increase in political instability or even a stream of ESG litigation cases, we are likely to see Western investors turn away and new, emerging players take on the risk.

Western governments will likely panic as doubts become more pronounced about whether sufficient capital will be made available to fund CRM production and processing in the years to come. This will hopefully spur these governments to put in place or expand existing incentives for business.



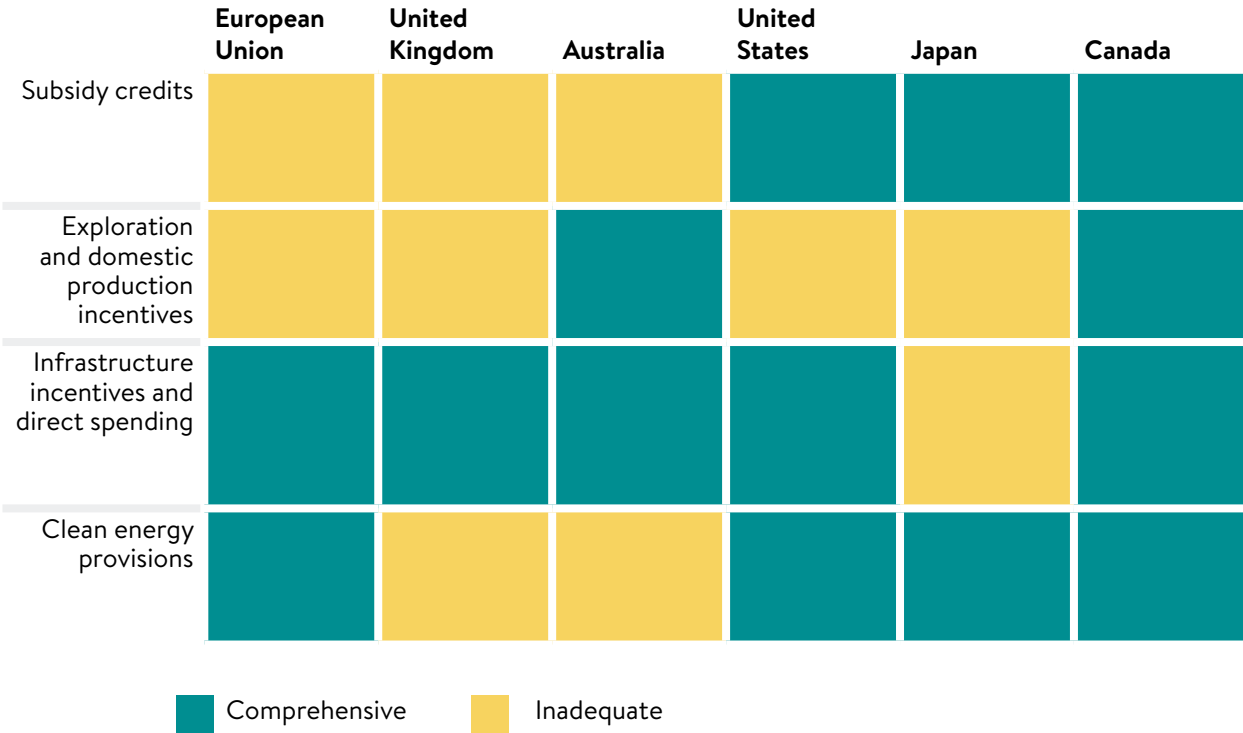
SECTION 3:

REGULATORY AND FISCAL INCENTIVES

KEY TAKEAWAYS

- ▶ The United States' Inflation Reduction Act (IRA) is the most ambitious incentives regime, designed to propel the development of critical minerals and renewable technologies. It outperforms Europe, Japan, the UK and Australia on multiple fronts, including spending. But the IRA is far from perfect: it is uncapped and arguably unaffordable.
- ▶ Other legislation covered by our research face their own range of problems. The EU's Critical Raw Materials Act is non-binding and its targets are aspirational. Sceptics doubt that the EU will be able to put strong legislation in place with real teeth given the need for consensus among the EU's 27 member states. The UK's platform is another laggard. It is hindered by push-back from cabinet members who remain wedded to the belief that free market forces will on their own drive the development of the clean energy sector.
- ▶ Western and other partners are working to boost collaboration, but the CRM agenda is complicated by competition and conflicting national interests. Countries are looking to protect or secure their long-term energy security and defence capabilities within a highly volatile global geopolitical environment. The most obvious manifestations of this are Russia's ongoing invasion of Ukraine and intense rivalry between the US and China.
- ▶ The CRM agenda of individual countries and their partners may also be disrupted by elections and potential changes in leadership. Whether likely or not, a Trump comeback in November 2024 could be detrimental to an already frayed rules-based international order and could undermine or derail collaboration with partners of the US on CRM.
- ▶ China can be expected to continue leveraging its monopoly over the CRM value chain. The People's Republic has a long track record of weaponising critical minerals to serve its geopolitical interests. In July 2023, Beijing announced export controls on gallium and germanium, which are used in semiconductors and solar panels, on national security grounds.
- ▶ Most of the experts we interviewed do not have a rosy outlook for CRM legislative and financial packages. Amendments to weak CRM regimes will likely progress in a slow and disjointed fashion. Siloed agendas and competing agendas are likely to hold the development of policy back.

Figure 5: How the critical minerals regimes of the EU, the UK, Australia, the United States, Japan and Canada compare.



Note:
 The classification of each category is based on our judgement which has been informed by conversations with a range of stakeholders and experts in the critical minerals space. Our qualification of “comprehensive” or “inadequate”, seen in the legend, is based on our assessment of each country’s or region’s policy as it relates to the whole mining value chain.

The following acts or pieces of legislation have been considered in our assessment of the regimes for each country or region.

- **The European Union:** The Critical Raw Materials Act (2023), The European Raw Materials Initiative (2008), The Conflict Minerals Regulation (2017), Global Gateway (2021–2017), InvestEU (2021–2027), The Corporate Sustainability Due Diligence Directive (2022), Net-Zero Industry Act (2023).
- **The United Kingdom:** Net Zero Strategy: Build Back Greener (2021), Resilience for the Future: The UK’s Critical Minerals Strategy (2022), Critical Minerals Refresh: Delivering Resilience in a Changing Global Environment (2023).
- **Australia:** Critical Minerals Strategy 2023–2030 (2023), Infrastructure Investment Program (2023)
- **United States:** Bipartisan Infrastructure Deal (2021), American Battery Materials Initiative (2022), Inflation Reduction Act (2022), CHIPS and Science Act (2022).
- **Japan:** Japan’s New International Resource Strategy to Secure Rare Metals (2020).
- **Canada:** The Canadian Critical Minerals Strategy (2022).

COMPARISON OF NATIONAL CRM AGENDAS AND HOW THEY ARE STIMULATING CRM DEVELOPMENT

Driven by defence-related concerns and the race to net-zero, a desire to reduce their dependency on fossil fuels and fears about the prospect of future supply chain disruptions (caused by pandemics or natural disasters), the West's policy landscape on critical minerals is evolving rapidly. Governments are pushing critical minerals to the top of their policy agendas. The visual on the previous page offers a high-level summary of how the most prominent national or regional (in the case of the EU) regimes perform against one another on critical minerals.

SUBSIDY CREDITS – WHICH JURISDICTIONS LEAD AND WHICH TRAIL


The United States is leading by a big margin on policy spending, having signed into law the Inflation Reduction Act (IRA) in August 2022, which is aimed at bolstering the country's supply chain resilience and incentivising domestic production of critical minerals. The IRA's cash-heavy package contains USD 368bn in subsidies for companies producing green technology, such as for critical minerals production, to smooth the transition to a greener economy. The funding dedicated to clean electricity tax credits, such as for geothermal or hydropower energy, is USD 161bn.⁵⁶

Certain commentators however warn that the IRA may have been too ambitious in its funding spree. Uncapped incentives do raise the question of how much will actually be available to back the IRA promises, particularly considering the breadth of the Act, says Ludivine Wouters. The rush for the IRA incentives both reflects this uncertainty and increases the amounts at risk, in terms of private investment as well as government incentives." Predictions by Goldman Sachs, Credit Suisse and the Brookings Institution state that the IRA's tax credits may eventually total an excess of USD 1tn in taxpayer money.⁵⁷

Japan also qualifies as a leader in subsidy credits. In April 2023, Japan's Ministry of Economic, Trade, and Industry announced plans to subsidise up to half the cost of mine development and smelting projects for lithium and other CRMs by Japanese

⁵⁶ "Breaking down clean energy funding in the Inflation Reduction Act" Mining.com, 1 June 2023. <https://www.mining.com/web/breaking-down-clean-energy-funding-in-the-inflation-reduction-act/>

⁵⁷ "Critics warn US Inflation Reduction Act could keep prices high" Financial Times, 24 April 2023. <https://www.ft.com/content/3f8cdb59-587b-4809-80a9-1f950d0f5bce>



companies.⁵⁸ Funding support for this initiative is made up of JPY 105.8bn (USD 788m) and will be provided by the Japan Organization for Metals and Energy Security.

Australia rests somewhere in the middle of the pack in its offering of subsidy credits and budgets for CRM projects. In June 2023, the CEO of Australian mining giant BHP reported that Australia's critical minerals strategy is not lacking in subsidies, but it must accelerate mine development and construction.⁵⁹ The challenge for Australia however isn't access to capital, but it is rather access to quality projects and expediting them successfully, says Joel Coward.

The United Kingdom stands out as the laggard in the group when it comes to policy spending. Despite projected spending on policies such as the British Energy Security Strategy, which is expected to leverage around GBP 100bn of private investment into the development of the UK's clean energy industry until 2030, the UK⁶⁰ is failing to keep pace with most of its Western partners on funding. This is because of pushback from cabinet members who remain wedded to the belief that free market forces will serve as a panacea and drive the development of the clean energy sector.

EXPLORATION AND DOMESTIC PRODUCTION – WHICH JURISDICTIONS LEAD AND WHICH TRAIL

The US leads the group of countries in its efforts to provide incentives for domestic production and manufacturing of products that absorb critical minerals. The IRA offers an Advanced Manufacturing Production Tax Credit (AMPTC) for businesses that manufacture and sell clean energy technology (which includes critical minerals) in-country. The AMPTC is equal to 10 percent of the cost of production for each clean energy component domestically produced and sold.⁶¹ However, the policy is sparse on exploration incentives. Ludivine Wouters explains that IRA incentives have not had the same notable effect on investment into exploration and mine development in the US as on processing,

58 “Japan to subsidize half of costs for lithium and key mineral projects” Nikkei Asia, 23 April 2023. <https://asia.nikkei.com/Economy/Japan-to-subsidize-half-of-costs-for-lithium-and-key-mineral-projects>

59 “Australia's critical minerals industry needs quicker permits, not subsidies – BHP” Mining.com, 26 June 2023. <https://www.mining.com/web/australias-critical-minerals-industry-does-not-need-subsidies-says-bhp/>

60 “Powering Up Britain: A plan for Britain's energy security” GOV.UK, 4 April 2023. <https://www.gov.uk/government/publications/powering-up-britain/powering-up-britain-energy-security-plan>

61 “Overcoming Critical Minerals Shortages Is Key to Achieving US Climate Goals” World Resources Institute, 3 May 2023. <https://www.wri.org/insights/critical-minerals-us-climate-goals>

manufacturing and renewables deployment. Policy implementation in the US is also challenged by the competing interests of state and federal governing bodies, explains Paul Kolbe. The policy ambitions of each state may not match the ones pitched at the federal level.

Next to the US, Canada is similarly leading on exploration and domestic production incentives. Canada's policy on CRM offers a 30 percent Critical Mineral Exploration Tax Credit (CMETC) for specific minerals.⁶² The tax credit, which is expected to cost USD 4.5bn over five years starting in 2023-2024, also targets machinery investments deployed for green energy manufacturing, as well as for CRM extraction and processing.⁶³

While the EU has produced frameworks to secure access to future supplies of CRM, the Union risks being left behind by many of its Western partners on exploration and domestic production. The European Commission introduced the Critical Raw Materials Act in March 2023. The Act outlines a set of benchmarks for domestic capacities including a pledge that at least 10 percent of the EU's annual consumption of strategic raw materials (SRM) – used for strategic purposes for defence or technology – must be produced domestically. It also sets a 65 percent limit on CRM imports from any single third-party country. However, these highly ambitious targets are non-binding, meaning that they can't be enforced. These targets are highly aspirational, and it is not clear how EU member states will implement the incentives or sanctions needed to effect change in supply chains, writes Peter Leon.⁶⁴

Some domestic projects in the EU are also struggling to take off due to legislative roadblocks.⁶⁵ Sweden, Finland and Portugal are expected to house the majority of new critical minerals mines, but issues around permitting and approvals could stagnate developments. Sweden is battling to receive an exploitation permit for its Luossavaara-Kiirunavaara Aktiebolag (LKAB) mine because the amount of oxides found in the reserve is too low.⁶⁶


62 The minerals specified in the CMETC include: copper, nickel, lithium, cobalt, graphite, rare earth elements, scandium, titanium, gallium, vanadium, tellurium, magnesium, zinc, platinum group metals and uranium. In order to qualify for the CMETC, one must prove that their expenditures will be incurred as part of an exploration project aimed at the list of specified minerals.

63 "Canada's 2023 budget targets critical mineral production with new tax credit" S&P Global Market Intelligence, 29 March 2023. <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/canada-s-2023-budget-targets-critical-mineral-production-with-new-tax-credit-74961435>

64 "The New Arms Race – EU Critical Raw Materials Act Highlights Intensifying Global Competition" Herbert Smith Freehills, 14 July 2023. <https://hsfnotes.com/energy/2023/07/14/the-new-arms-race-eu-critical-raw-materials-act-highlights-intensifying-global-competition/>

65 The language found in the EU's policy is murky around what qualifies as buy-in from local communities where SRM are located notes Diego Marin. This may become a problem when it comes to exploration and production (see Section 4).

66 Khan, Y. (2023) "Why Processing Sweden's Rare-Earth Haul Won't Be Easy" WSJ Sustainable Business. <https://www.wsj.com/articles/why-processing-swedens-rare-earth-haul-wont-be-easy-11675935006>



According to some experts, the slow pace of decision-making or even gridlock in Brussels may hamper the EU's goals more broadly. Ton Bastein makes the point that the EU suffers from a lack of agility not seen in Washington or Beijing because it is bound by the need for consensus from 27 member states. Peter Leon echoes this point, describing the “lack of clarity” that may prevent the EU from achieving a unified approach to CRM.⁶⁷ Conversely, in the case of the UK, Karen Hanghøj argues that post-Brexit the UK is more agile than before in its ability to make tailored and bespoke decisions. However, the UK's position will need to be strengthened by international engagement.

Japan likewise classifies as a jurisdiction that lags on exploration and upstream development. The country is low on onshore natural resources and has therefore been historically reliant on imports of CRM.⁶⁸ As a consequence, Japan's offering of subsidy credits, for mine development and smelting facilities as highlighted above, has improved in recent years to bolster its domestic capacities.

INFRASTRUCTURE INCENTIVES AND DIRECT SPENDING – WHICH JURISDICTIONS LEAD AND WHICH TRAIL

Infrastructure development appears to be a key priority for many countries. Alongside the US, Australia is leading the way in infrastructure incentives. Australia has laid out a substantial infrastructure agenda as part of its Critical Minerals Strategy 2023–2030. The government has introduced the Infrastructure Investment Program, a ten-year AUD 120bn investment (USD 81.8bn), to develop Australia's industrial landscape and attract large-scale investment. Australian federal treasurer Jim Chalmers recently alluded to business leaders that the government could not compete with the cash made available through the US IRA.⁶⁹

⁶⁷ “The New Arms Race – EU Critical Raw Materials Act Highlights Intensifying Global Competition” Herbert Smith Freehills, 14 July 2023. <https://hsfnotes.com/energy/2023/07/14/the-new-arms-race-eu-critical-raw-materials-act-highlights-intensifying-global-competition/>

⁶⁸ “The Geopolitics of Critical Minerals Supply Chains,” CSIS, Nakano, J. (2021). https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/210311_Nakano_Critical_Minerals.pdf?VersionId=DR03x5JlrwLnNjmPDD3SZjEkGEZFEcgt

⁶⁹ “Aus has no chance competing with Biden's IRA: Chalmers” ENB, 28 August 2023. <https://www.energynewsbulletin.net/policy/news/1458340/aus-has-no-chance-competing-with-biden-percentE2percent80percent99s-ira-chalmers>



The EU is also leading on the investment front for infrastructure projects. In January 2022, EU countries passed the Connecting Europe Facility (CEF) for trans-European energy networks in support of the green transition. The CEF proposes to invest over EUR 1bn (USD 1.12bn) in five infrastructure projects.⁷⁰

The Canadian government has made similar investments into infrastructure, forking out CAD 1.5bn (USD 1.14bn) for the development of CRM supply chains with a special focus on transport networks and priority deposits.

CLEAN ENERGY PROVISIONS – WHICH JURISDICTIONS LEAD AND WHICH TRAIL

The US is a leader in funding for clean energy provisions, including for CRM development. Included in the IRA's hefty budget are USD 51bn in credits for electricity produced from renewable sources and USD 22bn in residential clean energy credits for the adoption of green technologies, such as solar panels and heat pumps.⁷¹ The IRA is also projected to generate 5.9m new jobs in the clean energy and manufacturing sector in the coming decade.⁷²

Alongside the US, the EU is also strong on funding for clean energy. The EU is projected to spend EUR 800bn (USD 898bn) on subsidies for renewable energy between 2022–2031.⁷³ Additionally, under the EUR 800bn NextGeneration EU Covid-19 recovery programme, member states are required to commit at least 37 percent of spending to the green transition.⁷⁴

Japan has demonstrated engagement with multilateral partners to fortify its clean energy provisions. In March 2023, it was announced that Japan signed a trade agreement with the US on the CRM needed for EV batteries. The agreement

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- 70 “EU invests over EUR1 billion in energy infrastructure in support of the Green Deal” European Commission, 26 January 2022. https://commission.europa.eu/news/eu-invests-over-eu-1-billion-energy-infrastructure-support-green-deal-2022-01-26_en
 - 71 “Breaking down clean energy funding in the Inflation Reduction Act” Mining.com, 1 June 2023. <https://www.mining.com/web/breaking-down-clean-energy-funding-in-the-inflation-reduction-act/>
 - 72 Spengeman, S. (2022) “Inflation Reduction Act Benefits: Good Paying Jobs And Revitalized U.S. Manufacturing” Forbes. <https://www.forbes.com/sites/energyinnovation/2022/09/28/inflation-reduction-act-benefits-good-paying-jobs-and-revitalized-us-manufacturing/>
 - 73 “A global subsidy war? Keeping up with the Americans” Financial Times, 13 July 2023. <https://www.ft.com/content/4bc03d4b-6984-4b24-935d-6181253ee1e0>
 - 74 “Recovery plan for Europe” European Commission, 21 July 2020. https://commission.europa.eu/strategy-and-policy/recovery-plan-europe_en



requires the two nations to refrain from imposing export duties on lithium, cobalt, manganese, nickel and graphite.⁷⁵

The national strategies outlined here differ in their strengths and key characteristics, with some countries charging ahead with ambitious policies and others scrambling to keep pace. Ludivine Wouters offers a sobering perspective on the CRM landscape, arguing that any developments on policy are moot until a unified approach on how to jointly procure minerals is achieved.

THE ROLE OF MULTILATERAL AND BILATERAL AGREEMENTS

A notable number of countries have demonstrated their appetite to collaborate and forge multilateral and bilateral agreements in an effort to secure reliable supplies of CRM. The most prominent example of this is the Mineral Security Partnership, a US-led group of 12 nations plus the European Commission, established in June 2022. One of its primary intentions is to restrict China's role in the production of CRM needed for green technologies, defence and energy security purposes. On June 14 2023, it was reported that the group had produced a shortlist of 15 projects in the mining, processing and recycling of critical minerals over fears of China's ability to weaponise its supply chain.⁷⁶

The Critical Minerals Investment Partnership between Australia and India is another case of engagement, albeit at a bilateral level. In March 2023, the two countries reached an agreement to collaborate on CRM investment and develop new supply chains. Included in the partnership is an opportunity for India to lower its emissions and boost its manufacturing capacities, with a focus on EV production.⁷⁷ Similarly, the US and Japan signed a Critical Minerals agreement in March 2023 even though there is no free trade agreement between the two countries.

The EU has also demonstrated an interest in seeking economic partnerships with African countries of late. In June 2023, it was reported that the EU had agreed a trade deal with Kenya. The deal, known as the Interim Economic Partnership

⁷⁵ "US and Japan strike trade deal on critical minerals for electric car batteries" Financial Times, 28 March 2023. <https://www.ft.com/content/c8532c5e-abf2-4fba-9cc6-69a9726b3473>

⁷⁶ "US-led minerals partnership shortlists projects for green energy shift" Financial Times, 14 June 2023 . <https://www-ft-com.ezp.lib.cam.ac.uk/content/16927ddd-3cb9-4516-9934-eb94b032aea8>

⁷⁷ "Milestone in India and Australia critical minerals investment partnership" Ministry for the Department of Industry, Science and Resources, 10 March 2023. <https://www.minister.industry.gov.au/ministers/king/media-releases/milestone-india-and-australia-critical-minerals-investment-partnership>

Agreement, gives Kenya duty-free access to the EU market for all of its exports, including minerals.⁷⁸ Given the West's appetite to secure its own value chains, they now have to engage more comprehensively with the Global South. Africa's wealth of minerals, as seen in the DRC with its cobalt reserves and Namibia with lithium, means the West does not have many options beyond Africa, explains Peter Leon.⁷⁹

Africa's response to the increase in attention over its mineral wealth has seesawed between protectionism and constructive initiatives designed to support Africa's resource economy. Such as the African Minerals Development Centre which was adopted by the African Union Assembly in January 2016.⁸⁰

Latin America, another resource-rich region, is following a similar trend although traditionally it has been pragmatic. As of 2022, 60 percent of all identified lithium resources are located in Latin America. Chile, Bolivia and Argentina have been dubbed South America's "lithium triangle".⁸¹ In April 2023, however, Chile's President Gabriel Boric announced plans to nationalise the country's lithium industry in a strategic move to protect its economy and natural environment.⁸² Mexico also nationalised its lithium deposit in April 2022 in a push to restrict foreign exploitation from Russia, China or the US.⁸³

While efforts have been made to increase collaboration between international partners, the CRM agenda remains complicated by competitive behaviour and conflicting national interests. Countries are looking to protect or secure their long-term energy security and defence capabilities amid a fraught geopolitical environment – one defined by Russia's ongoing invasion of Ukraine and intensified friction between the US and China. These concerns have cast critical minerals as a matter of state intervention, says Patrick Schröder, where the weaponisation of energy policy clashes with global cooperation. This varies by country; the UK's

78 "EU agrees trade deal with Kenya as Brussels aims to boost Africa ties" Financial Times, 14 June 2023. <https://www.ft.com/content/6c3c33f2-11f3-4e8c-8f9b-811fe7d84355>

79 The investment landscape in Africa is peppered with risks and regulatory complications. Chief among them are crippling infrastructural issues which act as a drag on economic growth and hold back the development of mining operations. Companies seeking to invest or establish operations in Africa will therefore require an added level of understanding of the continent's fragilities, both economic and cultural, says Aly-Khan Satchu.

80 "African Minerals Development Centre" African Union, Accessed 17 August 2023. <https://au.int/en/amdc>

81 "Lithium: Here's why Latin America is key to the global energy transition" 10 January 2023. <https://www.weforum.org/agenda/2023/01/lithium-latin-america-energy-transition/>

82 "Chile plans to nationalize its vast lithium industry" Reuters, 21 April 2023. <https://www.reuters.com/markets/commodities/chiles-boric-announces-plan-nationalize-lithium-industry-2023-04-21/>

83 "Mexico's Lopez Obrador orders ministry to step up lithium nationalization" Reuters, 19 February 2023. <https://www.reuters.com/world/americas/mexicos-lopez-obrador-orders-ministry-step-up-lithium-nationalization-2023-02-19/>

regime on critical minerals is far weaker on security and defence than the US' IRA for example.⁸⁴

THE IMPORTANCE OF DOMESTIC POLITICS AND LEADERSHIP IN SHAPING THE CRM AGENDA

The relationship between individual leaders should not be overlooked as one of several factors which drive or enhance bilateral collaboration on critical minerals. The strong relationship between US President Joe Biden and Australia's Prime Minister Anthony Albanese, for one, has been highly influential in driving Australia's CRM goals, says Mike Rann. In May 2023, Australia and the US reached a joint agreement to coordinate policies in the interest of supporting Australia's critical minerals processing and investment industry.⁸⁵

Potential changes to leadership pose a challenge in other jurisdictions, however. The three-year election cycle in Australia and six Prime Ministers in 15 years may have impacted policy implementation and consistency. The US is another example of how leadership may change or derail its finely calibrated CRM agenda. The prospect of Donald Trump's re-election in November 2024, for example, may have a seismic impact on trade relations as well as on multilateralism. Trump may potentially support aspects of the IRA which are designed to generate more domestic jobs. His commitment to multilateralism, including initiatives on CRM, however, would be precarious, predicts Paul Kolbe.

Existing political movements whose values are incompatible with the green energy transition threaten to undermine CRM development, however. The Law and Justice Party (PiS), Poland's far-right populist government, recently demonstrated behaviour of this nature, when the climate minister, Anna Moskwa announced plans to appeal the EU's decision to ban the sale of fossil fuel cars across the bloc from 2035.⁸⁶ This obstructive stance towards the embrace of clean energy technologies could very well seep into Poland's attitudes towards CRM. According to Olimpia Pilch, however, Poland is an active mining nation where natural resources are

84 The IRA does not explicitly state that it has designed its capture of CRM specifically for defence purposes, but the legislation clearly prioritised energy security and defence in the face of China's growing threat.

85 "Australia wins U.S. support for critical minerals industry" Reuters, 23 June 2022. <https://www.reuters.com/markets/commodities/australia-gets-us-backing-critical-minerals-industry-2023-05->

86 "Poland to take 2035 fossil fuel car ban to top EU court, minister says" EURACTIV, 13 June 2023. <https://www.euractiv.com/section/road-transport/news/poland-to-take-2035-fossil-fuel-car-ban-to-top-eu-court-minister-says/>

valued. There has also been an increase in exploration. Poland is therefore arguably less likely to face opposition to critical mineral extraction.

Within Europe as a whole, green activists and other members of the green lobby may frustrate efforts to fast-track CRM mining ventures out of fear that the environment in affected areas will suffer as a result. Peter Leon points out that the green lobby in Europe is likely to oppose efforts to reduce permitting deadlines for new extractive and processing projects from 24 to 12 months.

Shifting political dynamics and ideological plates are not necessarily detrimental. The rise of the far-right Alternative for Germany party (AfD) for example is unlikely to adversely impact Germany's CRM strategy. AfD is pro-industry and pro-job development in Germany, so it is unlikely to try and divert the government's attention away from its goals on CRM, analyses Frank Schauff. Germany's political parties share the view that CRM development, and associated job creation, are necessary and that there must be a corresponding strategy for it.⁸⁷

THE CHINA FACTOR

While Western governments want to reduce their dependence on China for CRM, making the shift will be difficult. The geopolitical dynamics governing the critical minerals space are being driven largely by China's dominance in mining, as well as in processing and refining. Take lithium, for example. Lithium is a key component of the batteries that power electric vehicles and is frequently dubbed as "white gold" for EVs.⁸⁸ Australia mines 53 percent of the world's lithium supply, but 96 percent of Australian lithium is sent to China because that is where 56 percent of the world's lithium-processing facilities are located.⁸⁹ China is also benefiting from Russia's exclusion from most markets, taking full advantage of its access to Russia's vast reserves of essential minerals. In no position to barter, Russia must sell at the prices China sets.

⁸⁷ "German Chancellor visits three key Latin American countries in bid boost energy cooperation" euronews. 30 January 2023. <https://www.euronews.com/2023/01/30/german-chancellor-visits-three-key-latin-american-countries-in-bid-boost-energy-cooperation>

⁸⁸ The World Economic Forum (2023) "This chart shows which countries produce the most lithium". <https://www.weforum.org/agenda/2023/01/chart-countries-produce-lithium-world/>

⁸⁹ Sophia Kalantzakos (2020) The Race for Critical Minerals in an Era of Geopolitical Realignment, The International Spectator. <https://www.tandfonline.com/doi/abs/10.1080/03932729.2020.1786926>

China also dominates the recycling and refining segment of the CRM sector. In 2022, China's refining capacity expanded to 920m tonnes per year, or 18.4m barrels per day.⁹⁰ Patrick Schröder points out that China's strategic position in the downstream sector is reflected by its role in dealing with black mass – a by-product of lithium batteries that needs to be processed and refined and is crucial for reducing the carbon footprint of the battery supply chain.⁹¹ The process of breaking down black mass takes place predominantly in China. The People's Republic – which sits on the world's fourth largest proven lithium reserves – is therefore in a position of strength along the entire value chain.

Using critical minerals for geopolitical leverage, through hostile behaviour on trade, is a well-trodden path for China. Most recently, in July 2023, the Chinese government announced export controls on two metals (gallium and germanium) used in semiconductors and solar panels on national security grounds. In 2019, in the midst of a trade war, China threatened to ban exports of rare earth minerals to the US which would have held up the production of military equipment and clean energy technologies.⁹² Almost ten years prior, in 2010, the Chinese government blocked exports of certain critical minerals to Japan due to a dispute over the South China Sea. John Hughes warns of another scenario in which China reduces or closes down access to raw minerals or refined products if tensions with the West deepen.⁹³

China joined the WTO in December 2011 aided by the support of US lawmakers who campaigned for China's entry on the basis that it would help to alleviate poverty in China and boost US economic growth.⁹⁴ However, China has exploited WTO loopholes through currency manipulation and the use of state subsidies to boost its domestic manufacturing muscle.⁹⁵

90 “China takes top spot in global refining capacity but output lags U.S.” Reuters, 17 February 2023. <https://www.reuters.com/business/energy/china-takes-top-spot-global-refining-capacity-output-lags-us-2023-02-17/>

91 S&P Global (2023) “Black Mass: battery recycling to play a critical role in EVs globally”. <https://www.spglobal.com/commodityinsights/en/market-insights/podcasts/platts-future-energy/041823-black-mass-battery-recycling-ev-lithium-nickel-cobalt-manganese-price-assessment-supply-deficit>

92 Nakano, J. (2021) “The Geopolitics of Critical Minerals Supply Chains”. https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/210311_Nakano_Critical_Minerals.pdf?VersionId=DR03x5jlrwLnNjmPDD3SZjEkGEZFEcgt

93 Bradsher, K. (2010) “Amid Tension, China Blocks Vital Exports to Japan” The New York Times. <https://www.nytimes.com/2010/09/23/business/global/23rare.html>

94 “China joined the rules-based trading system – then broke the rules” POLITICO, 12 September 2021. <https://www.politico.com/news/2021/12/09/china-wto-20-years-524050>

95 “Ending China's 20-year WTO winning streak” POLITICO, 12 September 2021. <https://www.politico.com/newsletters/politico-china-watcher/2021/12/09/ending-chinas-20-year-wto-winning-streak-495395>

China's competitive behaviour on trade is also relatively unchecked, in part due to changes at the World Trade Organisation (WTO) that have weakened its power to act as an enforcer of trade rules, say Lisa Koch and Jo Feldman.

Despite Western concerns about China's control of CRM, there is merit in the argument that the streams of engagement between China and the West should remain open for enhancing collaboration. John Hughes suggests that an increase in knowledge and expertise sharing, such as through university partnerships, particularly on topics of mutual interest like action on climate change, could also aid in fostering a warmer engagement between China and the West.

If China posed less of a strategic threat, the logic to mitigating climate change in a globally unified fashion would be simple: we should supercharge efforts on EU regulation and combine competencies on US and Chinese technology says Olivia Lazard. However, China poses too much of a strategic threat to the West and the US in particular. It is unclear what incentive Beijing would have to collaborate extensively in a sector where it holds most of the cards.


TOO LITTLE TOO LATE

A legacy of muted engagement from Western industrial actors and governments has allowed China to dominate. Ton Bastein characterises the EU's CRM Act as "too little too late", citing the European Commission's lack of substantive financial contributions to stimulate activities. Peter Leon echoes this point, signalling the Act's lack of clarity and guidance on how its targets will be met.⁹⁶ Australia's policy is perceived in a similar vein, says Joel Coward, who conceives that it should have been released ten years prior.

In order to reduce their dependence on China, governments are now looking to amend or supplement their policy stances on CRM. The EU's policy on CRM is already evolving in light of feedback from the public on the proposed legislation.⁹⁷ The European Parliament will also vote on the EU Critical Raw Materials Act in October

96 "The New Arms Race – EU Critical Raw Materials Act Highlights Intensifying Global Competition" Herbert Smith Freehills, 14 July 2023. <https://hsfnotes.com/energy/2023/07/14/the-new-arms-race-eu-critical-raw-materials-act-highlights-intensifying-global-competition/>

97 "European Critical Raw Materials Act Feedback and statistics: Proposal for a regulation". https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13597-European-Critical-Raw-Materials-Act/feedback_en?p_id=31913581



2023. This may result in further changes to the policy.⁹⁸ Optimism for the UK's outlook is meagre and we are unlikely to see any further actional progress until the 2023 Autumn budget announcement, says Olimpia Pilch. The belief that free market forces will solve everything persists and is a roadblock to real change.

Even the IRA, which many observers use as a reference point to emulate, faces its problems. The IRA policy is turning out to be unmanageably expensive because it is composed of incentives for domestic investment that are, as we explained earlier in this section, uncapped. Policymakers in Washington are also nervous because the IRA is heavily focused on energy security and defence.

One year on from being signed into law, a mystery remains around how much the IRA legislation will actually cost. A study conducted in April by the University of Pennsylvania's Wharton School, in partnership with Goldman Sachs, estimates that the clean energy and climate portions of the IRA's final bill will exceed USD 1trn. A significant jump from their initial prediction which estimated a cost of USD 385bn.⁹⁹

LOOKING AHEAD

A clash of national interests has placed the CRM policy space at the centre of geopolitics. The result is a highly fractured and tense policy landscape. Things will likely continue to progress too slowly and in a disjointed fashion, with little chance of meeting the needs of the green transition.

Australia, for example, is hindered by lagging bureaucracy, where approvals at the state level for mining leases and other licences are difficult to obtain. The US faces its own difficulties due to a tense policy environment complicated by heated partisan gridlock. Paul Kolbe notes that the IRA is vulnerable to these tensions because it is associated with ESG and climate initiatives, an issue highly charged in the US.

⁹⁸ A refresher to the UK's CRM strategy was released in March 2023 which included the launch of an independent Task & Finish Group on Critical Minerals Resilience for UK industry, which will explore the CRM needed for businesses to bolster their supply chain resilience. Critical Minerals Refresh: Delivering Resilience in a Changing Global Environment" GOV.UK, 13 March 2023. <https://www.gov.uk/government/publications/uk-critical-mineral-strategy/critical-minerals-refresh-delivering-resilience-in-a-changing-global-environment-published-13-march-2023>

⁹⁹ "A Year into Biden's Climate Agenda, the Price Tag Remains Mysterious" Bloomberg, 16 August 2023. <https://www.bloomberg.com/news/articles/2023-08-16/total-cost-of-joe-biden-s-inflation-reduction-act-is-rising-one-year-later>



Proposed or existent legislation does not address the whole value chain and the immediate alternative is unclear. Laura Rich notes that there needs to be a greater understanding of the industry as an operating space, where the technical requirements – such as battery technologies, smelters, and refineries – are recognised and catered for. The smelters needed for copper, for example, take up to three to five years to build, explains Joel Coward.¹⁰⁰

The current trend of export controls – marked by the desire by resource-rich nations to gain greater value from their minerals – offers an opportunity for shrewd and agile investors with deep pockets to expand their business activities along the supply chain in host countries. More nimble governments in the Middle East and Asia, in particular the government of China, will be quick to fill this space, leaving many Western investors behind.

¹⁰⁰ The average copper mining project also takes around 17 years to develop from greenfield exploration to production. These lengthy timeframes, mixed with the aforementioned delays in gaining permits, stagnate the development of Australia's CRM sector.





SECTION 4: RESPONSIBLE MINING

KEY TAKEAWAYS

- ▶ Despite the commitment of many big, established miners to responsible mining, the industry's reputation continues to be tarnished by a legacy of bad or sub-optimal ESG practices.
- ▶ Weak governance is typically accompanied by weak human rights and environmental standards and practices, which can include community displacement from earmarked mining sites, pollution and forced labour.
- ▶ Some governments have played an important role in developing ESG standards and practices. Norway has fine-tuned its ESG reporting standards to transition from 'box ticking' towards more meaningful metrics and business-specific disclosures. However, as noted previously, the rise of large scale informal mining, unbound by ESG standards, continues to pose real harm to communities.
- ▶ Investment into the CRM sector is nonetheless hampered by a lack of international consensus on how to incorporate ESG as a single global standard. No single-source metrics are universally applied across the sector to effectively measure and compare ESG investment risk at national or subnational levels where conditions can vary significantly. It is hard to quantify 'social' and 'governance' performance in the same way as 'environmental' performance.
- ▶ The range of ESG metrics being applied by governments and companies is the result of conflicting or inchoate perceptions of ESG, different systems of governance and diverse public interests. A general lack of consensus between jurisdictions on how to implement regulations remains a chief stumbling block.
- ▶ Establishing a more unified stance towards ESG is not impossible. The escalating climate crisis is pushing companies and governments to adopt more stringent ESG standards. Corporates are also increasingly taking a leading role in developing ESG policy, driven by consumer and market demand.

ESG RISKS IN MINING

The mining industry suffers from a poor reputation following decades of controversies around human rights, the environment, public governance and social economic development. The rise of the ESG movement in recent years has only amplified this perception, as higher standards of accountability and transparency are pushing Western consumers and investors to be more aware of the risks associated with operating in high-risk jurisdictions.

Mining's tainted relationship with ESG is largely the result of the poor behaviour of certain, rather than all, mining companies in the sector. S&P Global Market Intelligence reports that 21 of the 30 largest mining companies by market capitalisation have pledged some level of net-zero greenhouse gas emissions target or are committed to reaching carbon neutrality.¹⁰¹ Companies such as BHP, Anglo American and Glencore are members of the International Council on Mining and Metals (ICMM), an organisation committed to “a safe, just and sustainable world.”¹⁰²

Despite the commitment of many big miners to responsible practices, the mining industry's reputation as a whole continues to be tarnished by a legacy of bad or sub-optimal ESG practices. For example, mining for copper and lithium in Chile has exposed parts of the country's already arid mining region to enormous water stress. It has deprived local communities of limited water resources and sparked continuous protests.¹⁰³ Local communities in Ghana have also battled with the consequences of illegal and artisanal mining, which have resulted in water pollution and other environmental hazards.¹⁰⁴

Community resistance to existing or planned mining operations is not confined to the Global South. We note the social backlash in northern Portugal, where permits are being awarded for the construction of a lithium mine by Savannah Resources. Local agricultural communities have filed legal action against the company for alleged invasion of their communal land, before any work has begun.¹⁰⁵

101 “ESG Insider Report” S&P Global, Accessed July 4 2023. <https://www.spglobal.com/esg/insights/featured/markets-in-motion/mining-and-esg>

102 ICMM, Accessed on 17 July 2023. <https://www.icmm.com>

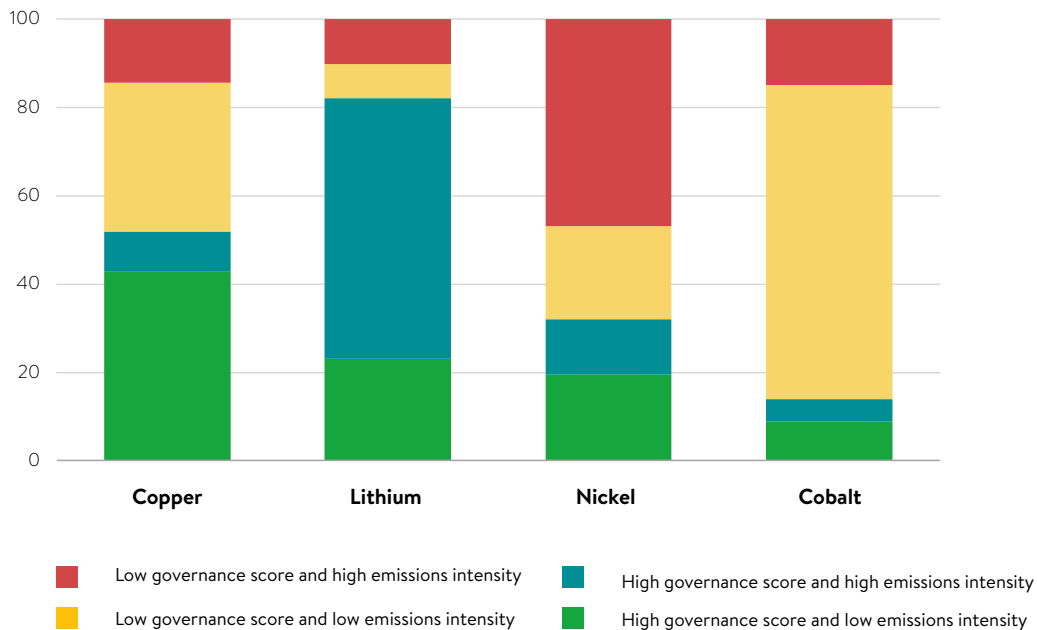
103 “Critical minerals supply and demand challenges mining companies face” EY, April 25 2022. https://www.ey.com/en_us/mining-metals/critical-minerals-supply-and-demand-issues#showref

104 “Ghana's battle with illegal artisanal and small-scale mining” LSE, 15 July 2019. <https://blogs.lse.ac.uk/africaatlse/2019/07/15/ghana-illegal-asm-artisanal-mining/>

105 “Portuguese community files legal action against Savannah Resources” Reuters, 22 July 2022 <https://www.mining.com/web/portuguese-community-files-legal-action-against-savannah-resources/>



Figure 6: Distribution of production of selected minerals by governance and emissions performance, 2019



Note: Analysis using the World Bank Worldwide Governance Indicator (as a proxy for governance) and electricity CO₂ intensity (as a proxy for emissions performance). Composite governance rank scores below 50 were classified as low governance and electricity CO₂ emissions intensity above 463 g CO₂/kWh (global average value in 2019) were classified as high emissions intensity.

Source: World Bank (2020), IEA (2020).

The ESG risks associated with certain CRMs can be more pronounced or varied than others. This can be largely explained by the territories where they are concentrated. The DRC, which boasts 75 percent of global cobalt production, stands out for its bleak track record on governance and its poor human rights profile. The latter is defined by child labour, weak site-safety standards for workers and involuntary displacement of communities to make way for mining operations.¹⁰⁶ By association with the DRC, cobalt and copper rank poorly on the ESG scoresheet.¹⁰⁷

¹⁰⁶ Baumann-Pauly, D. (2023) “Cobalt Mining in the Democratic Republic of the Congo: Addressing Root Causes of Human Rights Abuses”. <https://gcbhr.org/insights/2023/02/cobalt-mining-in-the-democratic-republic-of-the-congo-addressing-root-causes-of-human-rights-abuses>

¹⁰⁷ Cobalt is one of the key components found in electric vehicle batteries. According to a study conducted by the World Bank, the demand for these minerals is skyrocketing and could rise by over 450 percent by 2050, if green technology is deployed on a scale consistent with the Paris Climate Agreement. In spite of its liability on the ESG scale, cobalt is an essential to the development of green technology.



Entities dealing directly or indirectly with Mexico's lithium deposits risk becoming associated with organised crime because these deposits are located in territory controlled by drug cartels.¹⁰⁸ Afghanistan's rich lithium and chromite deposits have become linked to the Taliban, exposing any foreign powers or companies to reputational, financial and operational risk.¹⁰⁹

THE STATE'S ROLE IN DEFINING ESG STANDARDS AND PRACTICES

The state can play a critical role in ensuring investors apply strong ESG standards. The ESG agenda will resonate differently in particular countries or regions. Norway is commendable in this regard, having fine-tuned its ESG reporting standards in recent years to transition away from a "box ticking" approach and towards more meaningful metrics and business-specific disclosures. In 2019, the Norwegian government announced that it expects large companies to report on climate-related risk in adherence to the Task Force on Climate-Related Financial Disclosures, an initiative established in 2015 of which 31 nations are members.¹¹⁰

This attention to ESG is mirrored by the attitudes adopted by mining companies in Norway. Norge Mining, a Norwegian company focused on critical minerals, aims to "operate the most ecologically, socially and sustainable mine for Critical Raw Materials vanadium, phosphate and titanium."¹¹¹ But Norway has been in conflict with its indigenous Sami communities in the north over mining, Hanna Doller says, as has neighbouring Sweden.


This embrace of ESG stands in contrast to the hands-off approach of authorities in such high-risk jurisdictions as DRC and Myanmar. Poor governance is typified by bad pre- and post-licensing practices and/or failure to disclose the financial and business interests of public officials, among other shortcomings. The National Resource Governance Institute gave the DRC and Myanmar scores of 36 and 38

¹⁰⁸ "Organized crime threatens green minerals" Global Initiative Against Transnational Organized Crime, 14 December 2022. <https://globalinitiative.net/analysis/organized-crime-green-minerals-cop-27-climate-change/>

¹⁰⁹ "The world needs chromite and lithium. Afghanistan has them. What happens next?" *Los Angeles Times*, 3 November 2022. <https://www.latimes.com/world-nation/story/2022-11-03/afghanistan-mining-minerals-economic-hope>

¹¹⁰ "Environmental, Social & Governance Law Norway 2023" January 26 2023. ICLG.com <https://iclg.com/practice-areas/environmental-social-and-governance-law/norway>

¹¹¹ Norge Mining, Accessed on 18 July 2023. <https://norgemining.com>



out of 100 on its Resource Governance Index in 2021.¹¹² Conversely, Norway scored 86 out of 100. The state's attitudes towards ESG are directly correlated with the behaviour of most national private sector companies both when they invest at home and overseas.

THE IMPACT OF ESG ON THE CRM INVESTMENT SPACE

There is plenty of evidence to show that ESG has over recent years become a leading topic of debate across the investment landscape, with an increasing proportion of investors and governments demonstrating heightened sensitivity towards the impact of their operations. Between 2020 and 2021, the number of UN Principles of Responsible Investing (UNPRI) signatories jumped by 26 percent, from 2,701 to 3,940 signatories.¹¹³

However, the marriage of ESG and investment is hampered by a lack of consensus on how to incorporate ESG as a global standard. While ESG was originally introduced as a screening tool to generate risk-adjusted returns, it has become more heavily associated with delivering positive social impact. The conflation of these two goals, achieving returns and “doing good”, has contributed to the confusion and politicisation of the idea and the tool that is ESG.¹¹⁴

Another flaw is that ESG is still viewed by many as a buzzword term with no universally applied metrics to effectively measure and compare investment risk in countries and regions where conditions can vary significantly. Many companies also still view ESG as a box-ticking exercise, explains Philipa Varris. It is hard to quantify ‘social’ and ‘governance’ performance in the same way as ‘environmental’ performance. Joel Coward makes the point that you can offset carbon emissions, but not the cost of human slavery.

Community resistance to mining, or “Not In My Backyard” (NIMBY) sentiment, as a result of actual or perceived environmental damage, can slow or deter investment. Mining giant Rio Tinto had its mining licence revoked by the Serbian government in January 2022 for a lithium exploration project due to opposition from local

112 “2021 Resource Governance Index: Democratic Republic of Congo (Mining)” September 17 2021, NRGi. <https://resourcegovernance.org/analysis-tools/publications/2021-resource-governance-index-drc-mining>

113 PRI 2021 Annual Report, Accessed 19 July 2023. <https://www.unpri.org/annual-report-2021/how-we-work/building-our-effectiveness/enhance-our-global-footprint>

114 “Stuart Kirk: ESG must be split in two” Financial Times, 2 September 2022. <https://www.ft.com/content/4d5ab95e-177e-42d6-a52f-572cdbc2eff2>

communities who were protesting the environmental impact of the operations.¹¹⁵ Similar incidents of social resistance, as seen in the above-mentioned case of Portugal, may spook investors looking to invest in critical minerals.

While Western states and companies are positioning ESG as a selling point to host countries (through for instance the Minerals Security Partnership and the Critical Minerals Investment Partnership), China has sustained an altogether different approach. As indicated earlier in this report, Beijing has over the years actively sought to do business and successfully expanded its footprint in jurisdictions where ESG standards are weak. We don't expect a significant divergence from this trend.

There is no shortage of evidence to reflect that Chinese companies have not yet focused on social and environmental standards. An investigation in 2018 on the impact of Chinese companies mining for bauxite in Guinea revealed incidents of farmland exploitation and destruction of local water sources.¹¹⁶ Additionally, a report by the Business & Human Rights Resource Centre documented 102 human rights abuses incurred by Chinese overseas investment in green transitions minerals between 2021–2022. The highest number of violations, ranging from abuse against local communities and on workers' rights, were found in Indonesia, Peru, the DRC, Myanmar and Zimbabwe.¹¹⁷


THE PROSPECT OF ESG STANDARDS AND PRACTICES BEING ALIGNED BY WESTERN ACTORS

The range of ESG metrics being applied by companies and governments derives from conflicting or inchoate perceptions of ESG, different systems of governance, diverse public interests, in addition to a general lack of consensus between jurisdictions on how to implement regulations. While the same base-level principles will likely inform the development of similar ESG approaches in countries such as Australia, Canada, the US, the EU and the UK, there is a risk of over-regulating

¹¹⁵ Ambrose, J. (2022) "Serbia scraps plans for Rio Tinto lithium mine after protests". <https://theguardian.com/world/2022/jan/20/serbia-scraps-plans-for-rio-tinto-lithium-mine-after-protests>

¹¹⁶ "What Do We Get Out of It? The Human Rights Impact of Bauxite Mining in Guinea" Human Rights Watch, October 4 2018. <https://www.hrw.org/report/2018/10/04/what-do-we-get-out-it/human-rights-impact-bauxite-mining-guinea>

¹¹⁷ "Unpacking clean energy: Human rights impacts of Chinese overseas investment in transition minerals" Business & Human Rights Resource Centre, 6 July 2023. <https://www.business-humanrights.org/en/from-us/briefings/unpacking-clean-energy-human-rights-impacts-of-chinese-overseas-investment-in-transition-minerals/>



ESG. Laura Rich warns of the creation of an unintended “spaghetti bowl”¹¹⁸ of ESG standards with no consideration for jurisdictional requirements or conflicting interests.

States also need to have a greater understanding of the financial trade-offs and realities required to realise the green transition and embrace ESG practices. Government funding for subsidies and incentives to promote the development of green technologies, for instance, may strain public budgets. The jump to renewable energy could also spike energy prices, albeit in the short term, depending on the reliability and availability of renewable power sources.¹¹⁹ Policymakers will need to carefully consider these trade-offs and design mitigation strategies to manage the energy transition successfully.

Establishing a unified position towards ESG risk is not impossible. The EU taxonomy for sustainable activities, for instance, offers a classification system that provides clarity for companies and investors on which investments are environmentally sound.¹²⁰ In July 2023, the International Sustainability Standards Board announced the launch of the International Financial Reporting Standards Sustainability Disclosure Standards, aimed at helping companies to report on the sustainability risks and opportunities they face. The Global Reporting Initiative is also gaining steam as the EU confirmed in early September that GRI is “inter-operable” with its own European Sustainability Reporting Standards, so that companies do not need to apply more than one set of disclosure rules.¹²¹ It is too early to tell whether these frameworks balance qualitative and quantitative disclosures effectively.

The escalating urgency of the climate crisis is pushing companies and governments to adopt more stringent ESG standards. Corporates are also increasingly taking a leading role in developing ESG policy, driven by consumer and market demand, and informed by various global standards (which, as we point out, are not applied uniformly across the sector). Lisa Koch and Jo Feldman point out that trade and investment agreements between countries also promote regulatory consistency and harmonisation, which can also encourage greater policy alignment.

118 The original term “spaghetti bowl” refers to the confusion created by multiple bilateral trade agreements or FTAs outside of the WTO.

119 “Lessons for the energy transition from the 2021 energy crisis” World Economic Forum, October 4 2021. <https://www.weforum.org/agenda/2021/10/energy-transition-risks-crisis/>

120 “A Short Guide to the EU’s Taxonomy Regulation” S&P Global, 12 May 2021. <https://www.spglobal.com/esg/insights/a-short-guide-to-the-eu-s-taxonomy-regulation>

121 “Firms face simpler climate reporting under EU deal with GRI”, 5 September 2023. <https://www.reuters.com/sustainability/firms-face-simpler-climate-reporting-under-eu-deal-with-gri-2023-09-05/>



LOOKING AHEAD

We need to address the inconvenient paradox of the critical minerals agenda: mining to support the green transition must manage inherently acute environmental, social and governance risks. Without building consensus around how to assess, account for and mitigate those risks, the sector is likely to flounder despite widespread interest in critical minerals.

However, as the West dithers over ESG standards, less scrupulous operators and investors will likely move in. Instead of leaving the field open by divesting or avoiding new opportunities altogether, there will be increasing calls for mining companies and investors, to take greater ownership of the green transition. Some will suggest that we water down ESG standards. The right answer might lie in reaching consensus on the optimal conditions or standards that best protect rights holders without creating perverse incentives to meet urgent resource demand. Having a more mature debate about what the trade-offs are should help the sector charter a more sustainable path.





CONCLUSION

This report paints a bleak picture of the viability of the critical minerals agenda. We believe that the current investment, funding, and regulatory packages are insufficient to explore, mine and produce the critical minerals needed to power the green transition.

The funding gaps are real. We should not expect that the private sector alone will be able to, or will want to, fund new mines. The investment timelines are too long for many investors, and the risks from political instability, ESG concerns or NIMBYism, are too high.

While launching new legislative and financial programmes are a welcome move, they need to be accompanied by industrial packages that include major government and institutional funding for upstream investment. We also need to address the very real concerns that resource-rich nations are not getting their fair share. The likelihood of regimes imposing crippling taxes on miners or expropriating their assets diminishes if there are political and economic levers to wield.

To be clear, we are not suggesting that mining should be nationalised. But we are encouraging greater private-public partnerships, as well as bilateral and multilateral partnerships, that propel substantial investment and provide greater protection for upstream mining.

This year we have seen fires raging in Southern Europe and Canada, massive flooding in California, and Cyclone Freddy in southern Africa. Climate change is urgent. And while the recent flurry of green legislation has been boosted by national security imperatives, at some point these agendas will clash if supplies are limited: do we use the minerals we have to manufacture more EVs or do we replenish the depleted NATO stocks from the war in Ukraine?

We have to start having more open and realistic conversations about the future. It may be unfashionable to talk about demand management, but many experts believe it is time. The question is how politicians will frame national conversations about changing voters' lifestyles without risking their future political careers. Few people in the West want to hear that they will need to curtail their holidays or use public transport more often.



If we were to focus on three priorities, they would be:

1. De-risking investments through financial, economic, and political tools
2. Standardising ESG for greater clarity and transparency
3. Shifting government and institutional funding to upstream activities

As we look to the next decade, the demand for critical minerals is unlikely to abate. As things stand, it is unclear whether we will have access to large enough supplies. This isn't the time to sit back and watch what happens. We need to come together to collectively provide solutions so that the CRM market can flourish.





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