The Data Deficit: Canada's "Critical Minerals" Dilemma

Closing Information Gaps for a Resilient, Responsible Mineral Future

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1. Executive Summary

Canada has positioned itself as a major future supplier of "critical minerals" deemed essential to clean energy technologies, digital infrastructure, and national defence.[1] Federal and provincial strategies emphasize accelerated exploration, expanded mining, and integration into allied supply chains.[2] In exploring ways to broaden Canada's strategy — by identifying opportunities to reduce demand for "critical minerals" through efficiencies, substitutions, and planning, and diversifying supply through recycling, re-mining, and repurposing — we learned that Canada faces a significant data deficit.

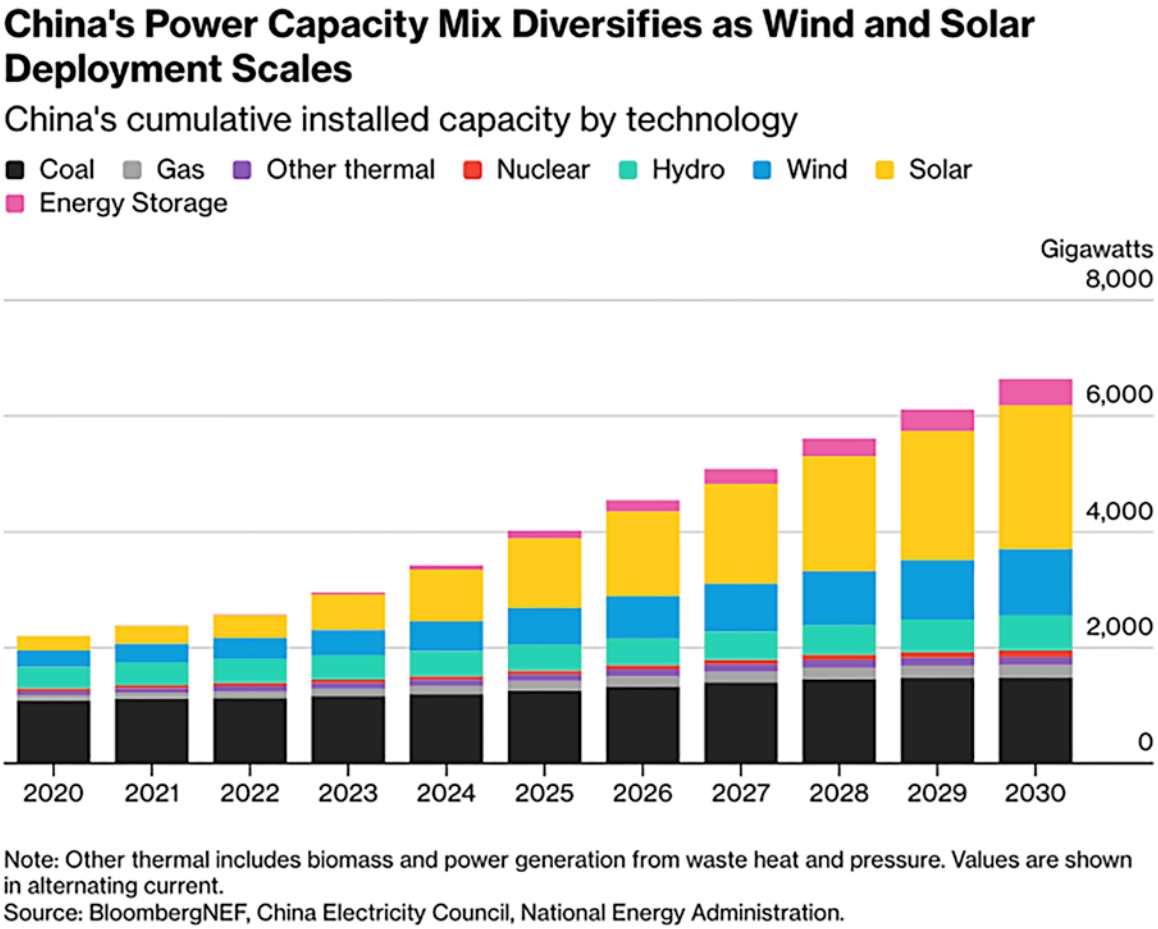
For this report, we set out to develop a snapshot of actual metal use in Canada for some of the priority "critical minerals" (namely lithium, cobalt, copper, and nickel) — how much is produced domestically, how much is imported, what are the recycling rates, what is the current use across different sectors (such as construction, transportation, and energy), and how much Canada contributes to these priority elements for the global energy transition. Our goal was to identify opportunities to achieve secure supply chains and enable the low-carbon energy transition while also reducing harmful environmental and social costs that come from mining.[3] This can be accomplished by reducing demand, finding efficiencies, exploring opportunities for material substitutions, and sourcing supplies from recycling, reusing or re-mining. But to know how to do that and put the right policies in place, we need data around existing domestic demand and sectoral consumption and use.

What we found is that publicly available information on domestic consumption, post-production flows, recycling, secondary recovery, and end use — including civilian, export, and military applications — is deeply fragmented or entirely absent for most minerals classified as "critical".[4] As a result, policy decisions rely heavily on global projections, industry disclosures, or international datasets that may not reflect Canada's specific material realities.[5] This data scarcity is not merely a technical limitation — it represents a strategic vulnerability that undermines evidence-based decision-making.

Canada remains largely a "mine and ship" jurisdiction. With minimal processing capacity[6] and a lack of manufacturing in Canada, as well as poor traceability and data collection, our "critical minerals" strategies focus heavily on expanding extraction while doing little to secure Canadian supply or meet our national climate targets. With a shortage of minerals, there are choices that need to be made about where and how to use our critical minerals supply. While other uses may be targeted (such as defence or tech), the failure to address green energy infrastructure will have long

term costs to society, the economy and ecosystems. Other governments, such as China or the EU, are being much more strategic, informed by data, to target the energy transition. In essence, our governments in Canada are predominantly supporting the rapid expansion of mining for export markets for whatever end use.

Canada is being short-sighted by focusing its strategy almost entirely on extraction, especially with limited data, sectoral analysis, investments across the supply chain, and policies to find efficiencies and alternative supply sources. The result is an inability to ensure mineral development strategies will meet Canada's strategic needs, have social license with communities and First Nations informed consent, and adequate policies and investments to support increased circularity to reduce social and environmental impacts. Moving forward, Canada needs to address its data gaps and broaden our "critical minerals" strategy with a focus on supporting a more sustainable and secure future.



Note: Other thermal includes biomass and power generation from waste heat and pressure. Values are shown in alternating current.
Source: BloombergNEF, China Electricity Council, National Energy Administration.

China has been strategically investing in renewable energy and the mining materials needed for more than two decades.

2. Introduction: Assessing Canada's Mineral Data Gap

2.1 Purpose and Scope

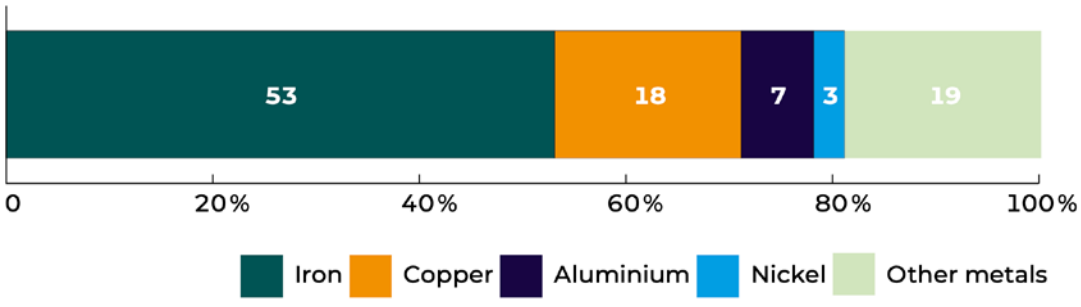
This report set out to assess supply and demand in Canada for four of the priority "critical minerals"[7] that are required for the energy transition — namely lithium, cobalt, nickel, and copper. Given industry and government focus on extraction and new mines, our goal was to get a snapshot of actual metal use in Canada for these transition minerals — domestic production, trade balance, demand across different sectors (such as construction, transportation, and energy), recycling capacity, and Canada's contribution to these priority elements for the global energy transition.

In learning more, we were hoping to identify ways to reduce demand for these transition minerals to alleviate the shortage from other industrial sectors, and explore substitutions or supplies from recycling or reuse, to avoid relying solely on new extraction. We were unable to do so, however, because Canada lacks the nationally specific data required to answer these questions.

For example, if we knew how much of the domestic demand for these metals was for the transportation sector and manufacturing vehicles, we would likely find that we need to create policies not just to incentivize electric vehicle adoption, but to incentivize Canadians into both smaller vehicles and onto public transit.[8] We also likely need more policies to re-use EV batteries and create demand for recycled materials by mandating a portion of recycled content into domestic battery production. These are being put forward in other jurisdictions.[9,10] While conversations are happening around improving data and the circular economy,[11] right now Canadians don't know how much domestically mined materials go toward the transportation sector nor what other sectors, like construction, are using.

While production figures and import/export data are generally available, tracking material flows beyond extraction is weak. This makes it difficult to verify supply security, domestic need, or strategic resilience in a world competing for the same "critical minerals". International datasets and industry estimates are frequently used in place of domestic data, obscuring Canadian-specific realities.

Figure 7 – Share of metals in the consumption of metallic raw materials in the transport equipment category in 2019 Source: Own figure based on ifeu, 2023 and Lutter et al., 2022



This data from Germany led to the conclusion that reducing the number of new car registrations by 30 percent per year could reduce the demand for iron, aluminium, copper, and nickel by almost 31.2 million tonnes by 2050. *Source:* Reducing metal consumption: Practical suggestions for the raw materials transition, *PowerShift, 2024.*

2.2 "Critical Minerals" and Policy Assumptions

The concept of "critical minerals" has gained prominence amid geopolitical tensions, climate commitments, and supply-chain disruptions. Over the past several years, Canada has introduced a suite of policies aimed at accelerating the development of "critical minerals",[12] while also directly funding infrastructure and fast-tracking mining projects.[13,14]

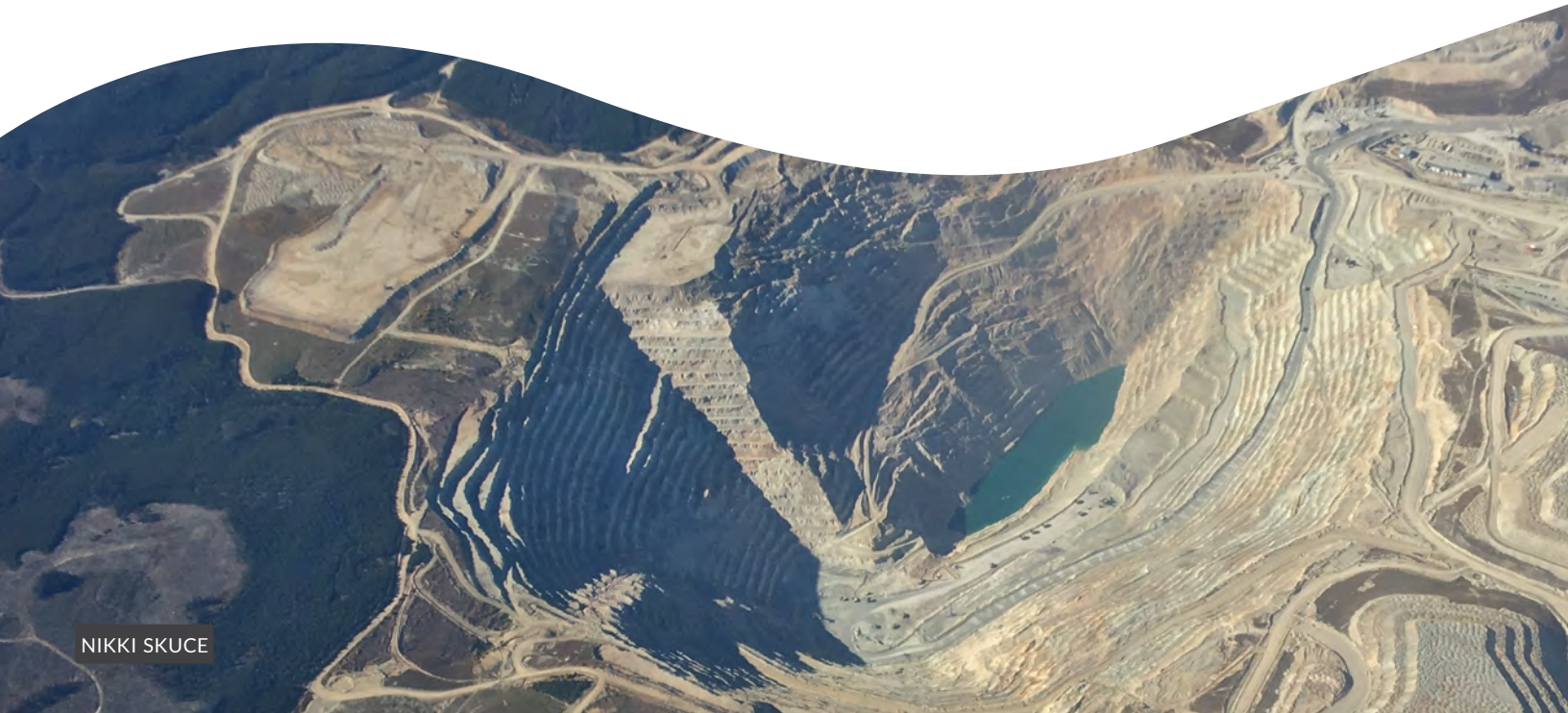
The federal *Canadian Critical Minerals Strategy* identifies 34 minerals deemed essential to clean energy technologies, digital infrastructure, and national security, and prioritizes six of them — lithium, nickel, cobalt, copper, graphite, and rare earth elements (REEs).[15] Criticality is not an objective or static characteristic.[16]

2.3 Critical gaps

How nations define criticality is fundamentally political, strategic, and institutional.[17] Decisions about which minerals are deemed "critical" reflect industrial policy objectives,[18] trade relationships,[19] military and security considerations,[20] and private-sector investment interests as much as clean energy priorities.[21] Without transparent, standardized data, it is unclear whether Canada's definition and priority list of "critical minerals", as well as policies, respond to actual national needs, rely on strategic assumptions and industry projections, or are simply following global trends.[22]

Minerals are sometimes labeled "critical" because systems that depend on them are vulnerable to disruption due to limited or concentrated processing, lack of substitutes, poor recycling, or reliance on few suppliers.[23] Assessing these risks requires comprehensive data across the value chain — production, domestic use, substitution, recycling, secondary recovery, and stockpiling — which Canada currently lacks.[24]

International institutions increasingly recognize that mineral security depends as much on demand-side measures — efficiency, substitution, durability, and recycling — as on extraction.[25] By ignoring these factors, Canada's policy decisions default to mining expansion rather than addressing the real sources of vulnerability that make minerals "critical" in the first place.



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3. The "Critical Minerals" Context in Canada

3.1 Policy Drivers and Global Pressures

Canada's "critical mineral" strategy is designed to support:

- The transition to clean energy technologies, such as electric vehicles (EVs), wind turbines, and solar panels.
- The digital economy, which relies on advanced electronics, batteries, and semiconductors.
- Military applications and national security, where access to stable mineral supplies is considered strategically important.[26]

This has led to accelerating permitting and project development at both federal and provincial/territorial levels.[27] But these ambitions exist within a highly dynamic global market. Supply chain disruptions,[28] export restrictions from major producers,[29] and geopolitical tensions can all reshape which minerals are genuinely "critical" at any given time.[30] For example, lithium and cobalt are concentrated in a small number of producing countries—the Democratic Republic of Congo for cobalt;[31] Australia and Chile for lithium.[32,33] High-grade nickel, which is crucial for electric vehicle batteries, is predominantly sourced from regions like Russia and Indonesia (where the majority of the world's nickel is refined).

Processing and refining are even more concentrated, with China refining roughly 90 percent of rare earths and 60 to 70 percent of global lithium and cobalt,[34] raising concerns about supply reliability for Canada's domestic and export-oriented industries. Even if Canada increases mining of lithium, for example, it has no commercial-scale refineries, meaning raw materials would need to be exported for processing (likely to China). China also dominates the production of photovoltaics, EV batteries, and increasingly semi-conductors.[35]

3.2 Security vs Transition Drivers

The transition to renewable energy and away from fossil fuels is an urgent imperative, but many of the priority minerals needed for the energy transition are also used for defence purposes — and Canada has pledged to more than double its military budget.[36] Many of the same transition minerals needed for wind turbines are also critical for missile production.

- **Transition-driven:** Initially, many countries focused their "critical minerals" strategies on achieving net-zero by 2050,[37] emphasizing clean energy, EV batteries, renewable infrastructure, and emissions reduction. The priority minerals needed for the energy transition face some vulnerabilities due to concentrated supply and processing. However, without tracking domestic manufacturing needs, consumption, and recycling, Canada cannot determine whether increasing extraction genuinely supports low-carbon needs or primarily serves export demand for other purposes.

  Canada also lacks systems to track and prioritize mineral demand for socially beneficial industries (i.e. away from military purposes and toward renewables and EVs). While Canada's "critical minerals" strategy

has mostly focused on mining and enabling infrastructure, it has made major investments in some EV battery production and recycling facilities in an attempt to address the whole value chain for that one sector.[38]

- **Security-driven:** Increasingly, "critical minerals" strategies are also focused on military and weapons applications,[39] national defence, aerospace,[40] electronics,[41] and strategic industrial capacity.[42] The purchase of just one F-35 requires approximately 120 lbs of cobalt and 920 lbs of rare earth elements.[43] Data scarcity obscures military end uses, such as alloys, naval components, or secure communications. Interestingly, Canada's strategy originally focused on integration and supply for U.S. military purposes.[44] Its recently announced Defence Industrial Strategy now includes increasing demand for Canadian minerals and metals for domestic manufacturing in defence supply chains,[45] and its recently announced "First and Last Mile Fund" is for projects that significantly contribute to critical minerals "for energy and defence".[46]

Some mining subsidies for military use are more explicit: both the B.C and federal governments recently announced support for the Wicheeda Rare Earth Elements Project,[47,48] whose proponent, Defense Metals, has connections to the U.S. CIA and administration.[49]

Source: "Canadian critical minerals support North American defence," Government of Canada (2025)

3.3 Data Limitations and Strategic Risk

The International Energy Agency (IEA) projects sharp increases in demand for Canada's six priority "critical minerals" (lithium, nickel, copper, cobalt, graphite, and REEs) under clean energy scenarios.[50] However, these bullish projections are based on scenarios with assumptions about global electrification, technologies staying fairly constant, and climate policies enacted that lack Canada-specific detail. Canada's reliance on them to justify domestic mining expansion highlights a key problem: global projections cannot replace domestic transparency, sector-specific data, and verified supply security.[51]

Canada faces systemic information gaps: domestic consumption and industrial use are poorly tracked; post-production flows (recycling, tailings, secondary markets) are largely opaque; and supply chain traceability is limited, especially given limited domestic processing capacity, making it difficult to assess how our current strategy meets our needs. Without addressing these gaps, Canada risks overestimating domestic supply and demand while potentially misaligning investments in new mining that don't meet genuine strategic requirements.

3.4 Social, Environmental, and Indigenous Dimensions

Mining is already a major source of environmental harm,[52] causing ongoing problems like water pollution and impacts to sensitive species.[53] Meanwhile, inadequate funding,[54] insufficient reclamation, poor waste management,[55] and risks of tailings dam failures worsen its environmental liabilities.[56]

Taxpayers are still paying for massive clean-up costs — $46 million upfront plus $3 million annually at Britannia (B.C.), an estimated $2 billion at Faro (Yukon), and $4 billion and counting at the Giant Mine (NWT).[57] Communities continue to suffer from disasters such as Mount Polley in B.C. and Eagle Gold in the Yukon.[58,59]

TULSEQUAH MINE / CHRISTOPHER MILLER - CSMPHOTOS.COM

New federal and B.C. policies accelerate permits and environmental assessments in the name of "critical minerals,"[60,61] even though existing rules already fail to prevent harm. An investigative review of the Red Chris Mine — included on fast-track lists — found significant contamination, habitat destruction, and tailings safety concerns despite general permitting compliance.[62] Scaling up mining under the current regulatory regime risks exacerbating these failures and environmental impacts.

While Canada's "critical minerals" strategy recognizes Indigenous rights and includes funds for capacity building, fast-tracking some of these projects creates risks if the Free, Prior and Informed Consent of Indigenous peoples is not fully ensured.

Globally, reporting frequency and coverage vary, and social and environmental metrics — water use and pollution,[63] tailings characteristics,[64] emissions intensity,[65] and impacts on Indigenous lands and rights — are inconsistently disclosed by mining companies.[66] As a result, production statistics alone cannot support meaningful assessments of sustainability, risk, or long-term liability, leaving governments and the public unable to fully verify the origins, processing, destinations, or impacts of "critical minerals".

As part of its "critical minerals" strategy, the federal government has invested in developing ways to track Canada's Environmental, Social and Governance (ESG) in mining supply chains.[67] Although a positive step, the pathway and implementation remain unclear, and seem to be based on assumptions that all Canadian mining laws and regulatory systems meet ESG standards.

MOUNT POLLEY DAM BREACH DISASTER / CARIBOO REGIONAL DISTRICT

4. Traceability, Post-Production, and Circular Economy Gaps

Traceability — the ability to follow minerals from extraction through processing, use, reuse, and disposal — is essential for assessing supply security, verifying responsible sourcing, and understanding environmental and social impacts.[68] In Canada, traceability is uneven and breaks down at multiple points along the mineral value chain.

4.1 Traceability and Post-Production Flows

Public reporting is strongest at extraction, where Natural Resources Canada (NRCan) publishes annual production volumes by mineral and province, highlighting Canada's role as a resource producer.[69] After primary production, public data availability quickly declines: refining, domestic consumption, and end-use are inconsistently reported or sometimes not reported at all, and some information is withheld for commercial confidentiality.[70]

For the most part, it is not possible to trace the end-use of Canadian mined materials. Most of British Columbia's mined materials are shipped overseas for refining and are not easily traceable, as the materials can be sold anywhere for any use.[71] Traceability is sometimes possible from refineries; for example, Vale signed a long-term contract with Tesla Inc. to supply 30–40% of its nickel from its Ontario and Newfoundland & Labrador operations directly for electric vehicle production in the U.S. But such arrangements are rare.[72]

There are other places where inferences can be made. Canadian steel mills produce 12.0 million metric tonnes a year, with 5.5 million tonnes sold domestically and the majority of exports going to the U.S. The auto-sector is a major domestic consumer, but actual consumption figures remain unclear.[73]

Once minerals enter markets, they are commonly blended with imports, making it difficult or impossible to trace origin, production conditions, and environmental or social impacts along the value chain.[74] If "critical minerals" mined in Canada are exported for further processing, they simply become part of the global market.[75]

International demand clearly exists for EVs, renewable energy, digitization, industrial applications, and military purposes.[76] There is both global competition for similar energy and digital transitions using the same raw resources, and competition among sectors. But Canada does not know how much its own manufacturing, construction, and infrastructure sectors require — or how much supply could be secured through efficiency, recycling, EV battery reuse, or re-mining. Without this information, claims of urgency and the need for more extraction through expedited processes lack justification or alignment with strategic goals.

4.2 Circularity and Secondary Production Gaps

Recycling, re-mining, and secondary recovery are critical for resilient and sustainable mineral supply chains. Globally, circular strategies reduce primary extraction, lower environmental impacts, and enhance supply security.[77] In Canada, however, national data on circularity remain sparse: recycling rates, tailings recovery, and secondary production are often project-specific, survey-based, or estimated from pilot studies.[78] The domestic contribution of circular strategies to "critical mineral"

supply is poorly quantified, and potential environmental benefits — such as reduced tailings hazards, water contamination, and land disturbance — are largely unaccounted for.[79]

Consequently, circular economy strategies remain peripheral to decision-making, compounded by limited government regulation or incentives for EV battery repurposing, recycling, tailings re-mining at legacy mines,[80] and other circular measures.[81] Without credible data on scale or impact, policymakers default to extraction-led approaches and fail to incentivize efficiencies, circularity, or research into substitutions.

4.3. Examples of other jurisdictions data tracking and analysis

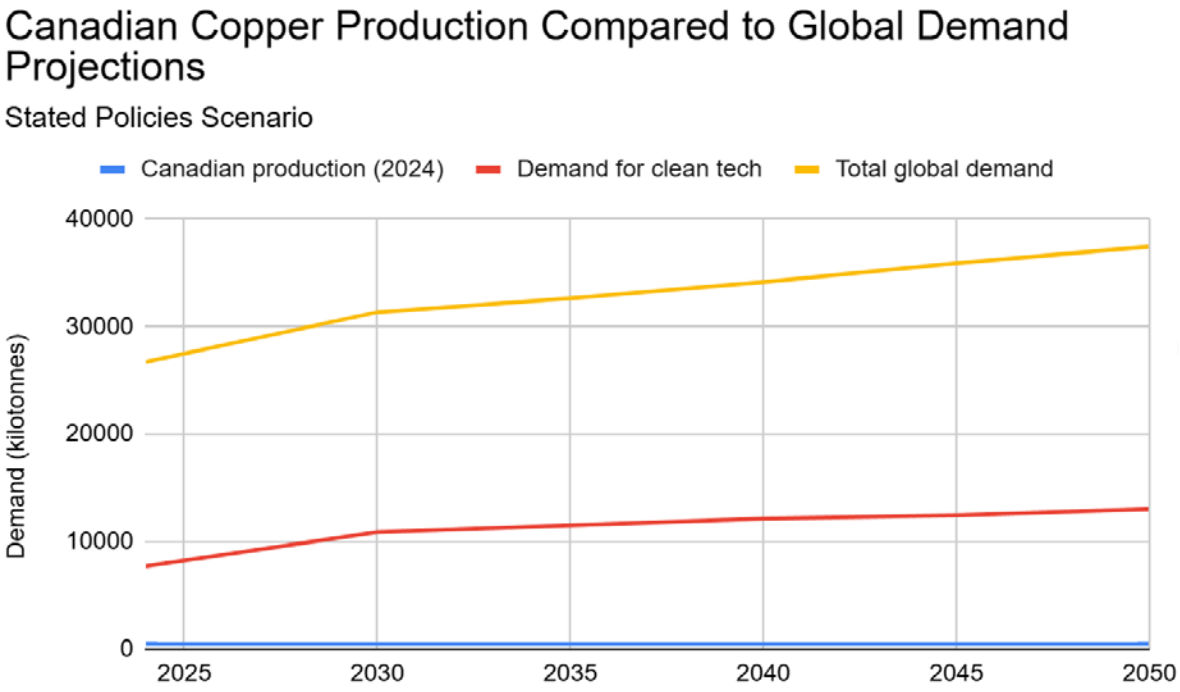
Although mining falls under provincial jurisdiction in Canada, national-level data tracking and analysis remain limited. While the examples below illustrate models of data collection and analysis Canada could adopt to inform its strategy, they do not necessarily imply endorsement for their policies or recommendations.

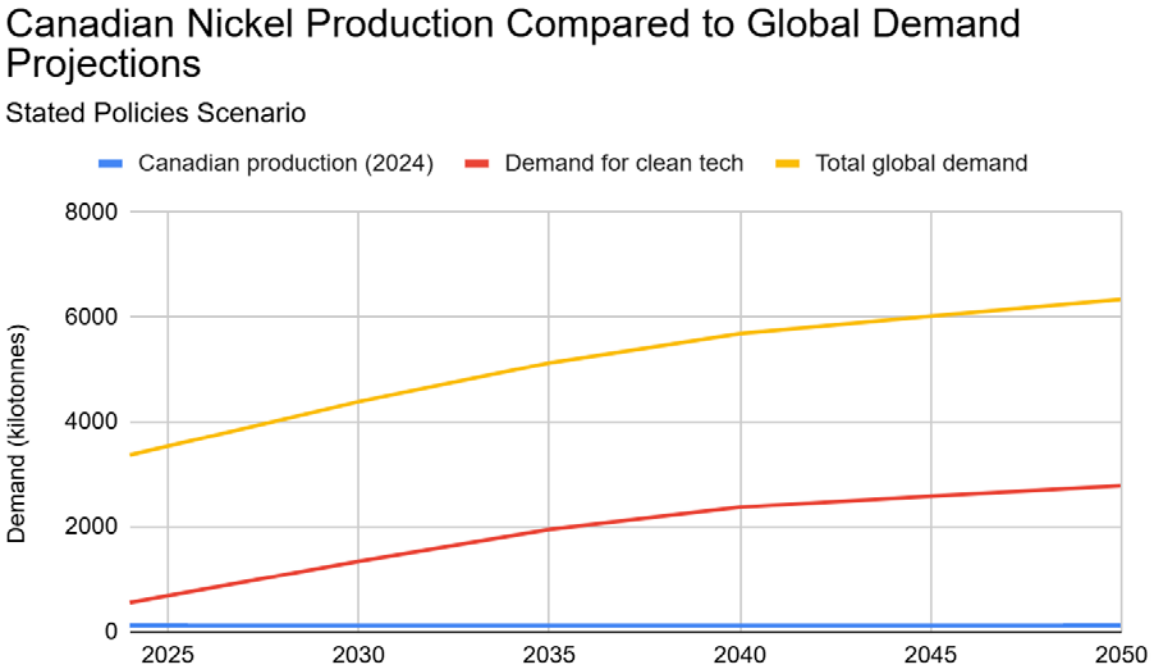
- In 2023, the European Union's Joint Research Centre released *Supply chain analysis and material demand forecast in strategic technologies and sectors in the EU — A foresight study.*[82] This analysis examines a set of key sectoral uses (renewable energy, EV mobility, industrial, digital, and aerospace/defence) and evaluates complete value chains. The study identifies the EU's material needs and vulnerabilities, and provides a set of recommendations. These include recycling, reuse, and resource efficiency; demand mitigation through behavioural change; and investments in resource recovery and recycling. They also include recommendations for stockpiling and trade diversification.
- For decades, the US Geological Survey (USGS) has published publicly available statistics on U.S. and global mineral production, consumption, and trade for most elements,[83] as well as monthly or quarterly mineral commodity summaries.[84] These publications often detail predominant uses, recycling sources, and potential substitutions. This data informed the 2022 U.S. strategy to secure the supply chain for a clean energy transition.[85] Priorities have shifted drastically under the current U.S. administration. The "*One Big Beautiful Bill Act*" allocated billions of dollars to stockpile "critical minerals" for military purposes,[86] which often overlap with minerals needed for the energy transition.

Canada holds approximately 1–5% of the world's reserves for five of its priority "critical minerals".[87] However, being well-positioned is not the same as being fully prepared, much less able to be more than just a "mine and ship" jurisdiction. Continual monitoring of supply chains and sector-specific forecasts is crucial for achieving climate commitments, reducing vulnerabilities, and finding efficiencies and alternatives.

In summary, data gaps along the mineral value chain render Canada's strategy more vulnerable, extraction-focused, and less evidence-based. Closing these gaps — through standardized reporting, post-production tracking, and circular economy integration — is essential to developing policies and priorities that strengthen resilience, sustainability, and accountability.

Canada's production of copper and nickel accounts for 2% and 3.7%, respectively, of global demand today and under an International Energy Agency scenario.





Natural Resources Canada, "Annual Statistics of Mineral Production, 2024" (last modified 28 February 2025), online (dataset): https://mmsd.nrcan-rncan.gc.ca/prod-prod/ann-ann-eng.aspx#TTA2.
International Energy Agency, "Critical Minerals Dataset" (last modified May 2025), online (dataset): https://www.iea.org/data-and-statistics/data-product/critical-minerals-dataset.

5. Mineral-Specific Analysis: Lithium, Cobalt, Nickel, and Copper

Canada produces several "critical minerals" used in clean energy technologies and other applications considered economically or militarily strategic. Out of Canada's six priority minerals, we chose to look at lithium, cobalt, nickel, and copper. While national reporting on primary production is relatively strong, public data on domestic consumption, sectoral use, recycling, and post-production flows remain limited.[88] As a result, production is well measured, but downstream use and secondary supply are often assumed, creating significant data gaps.

5.1 Lithium: Strategic Importance Without Domestic Evidence

Lithium is cited as critical for electric vehicle (EV) batteries and energy storage, among other applications.[89] In 2024, Canada reportedly produced 41.7 million kilograms of lithium, primarily in Manitoba, with the majority, 39.2 million kilograms, exported.[90] Canada lacks comprehensive public accounting of domestic lithium use by sector.

International demand projections, particularly from the IEA, are often cited to justify expansion.[91] The IEA projects global lithium demand of 455 to 707 kilotons by 2030, depending on policy scenarios.[92] Current Canadian production could meet roughly 5.9–9.2 percent of this projected demand.

Canada has emerging lithium projects in Quebec, Ontario, and Manitoba,[93] but production remains limited relative to global supply, and prices have remained relatively low since a 2022 supply glut.[94] While there have been recent fluctuations in Canadian and provincial EV vehicle incentives and

ELECTRIC BUS TRIAL, VANCOUVER / STEPHEN REES VIA FLICKR

policies, there is a lack of public data on Canada's production capacity to directly feed domestic manufacturing needs. We also know that smaller electric vehicles can significantly reduce the demand for "critical minerals"; an electric bus battery uses approximately nine times less lithium, and an e-bike 240 times less, than an E-Hummer.[95] Data can help inform policy direction and a broader strategic approach to the energy transition that is resource efficient.

5.2 Cobalt: Global Narratives, Limited National Insight

Cobalt is used in batteries as well as aerospace and military applications.[96] Based on 3,351 tonnes of cobalt produced and 3,361 tonnes exported in 2024, domestic consumption of Canadian mined materials is inferred to be minimal.[97] Canada imported some cobalt, but is a net-exporter which indicates that Canada's designation of cobalt as 'critical' reflects global market narratives more than clear national reliance.[98,99]

Most cobalt is a byproduct of nickel and copper mining in Canada, which complicates tracking.[100] Post-production flows are difficult to trace because cobalt is embedded in complex alloys and batteries. Environmental and health impacts from cobalt extraction and processing are acknowledged but not clearly quantified nationally.[101] Finding substitutions for cobalt (as is being tried for EV batteries) could substantially reduce the global projections for increased demand of cobalt.

5.3 Nickel and Copper: Scale Without Transparency

Canada is a significant producer of nickel and copper,[102] yet production data is not matched with transparent reporting on domestic use, recycling rates, or secondary supply.

Nickel

Canada is a leading nickel producer, extracting 125,363 tonnes of nickel in 2024, with the majority exported.[103] Domestic consumption and sectoral uses are not fully tracked, particularly for industrial applications like stainless steel or batteries. Lack of standardized reporting prevents policymakers from assessing supply security under rising global demand for EV batteries. Environmental impacts from mining and processing, including biodiversity risks and water contamination,[104] are recognized, yet consistent national reporting is lacking. Some substitution potential exists but is not well quantified in the Canadian context.[105]

Copper

Copper has applications in electricity generation, transmission, electronics, and low-carbon technologies. Canada produced 514,582 tonnes of copper in 2024, primarily in British Columbia.[106] In the same year, Canada exported 534,610 tonnes of copper, exceeding the amount extracted (likely from previous year's mined ore and recycled materials).[107] Recycled copper requires 85 percent less energy than primary production and maintains its value.[108] The majority of Canada's copper recycling occurs at smelting and refining facilities in Rouyn-Noranda and Montréal, Quebec.[109] The federal government also recently held on-line public engagement to assess interest in developing a copper smelter in Western Canada.[110] Canada lacks data and analysis on domestic copper demand and sectoral uses, despite maintaining a positive net trade balance.

5.4 Summary of Data Gaps Across Minerals

Across lithium, cobalt, nickel, and copper, several common data gaps emerge:

- **Domestic consumption:** Most data focuses on trade and export/import statistics. Reliable estimates of Canadian end-use are limited, with domestic use being particularly negligible for cobalt and nickel, and modest for lithium.
- **Recycling and secondary sources:** Some recycling capacity in Canada exists, but national figures of recycled materials for domestic use are missing. Global trends make clear that investments in recycling capacity are needed now for long-term security of supply.
- **Environmental and social impacts:** Water use, contamination, biodiversity effects, occupational health, and Indigenous rights are unevenly documented. Mineral-specific impacts, such as lithium's water and arsenic issues or nickel's biodiversity risks, are not comprehensively quantified, and ESG tracking for metals is not fully implemented.
- **Substitution potential:** Feasibility and performance trade-offs for substituting "critical minerals" are poorly understood. Lithium shows some substitution potential,[111] while cobalt and nickel can be harder to replace without loss of functionality or increased costs. However, research and development are important for identifying substitution opportunities to reduce vulnerabilities.[112]

Addressing these gaps is critical for Canada to develop a reliable "critical minerals" strategy that supports clean energy transitions while minimizing environmental and social risks.

6. Implications of Data Scarcity

Incomplete, inconsistent, or opaque data has significant consequences for how Canada defines, governs, and justifies its "critical mineral" strategy. These effects extend beyond technical planning failures to issues of environmental risk, Indigenous rights, and democratic accountability.

6.1 Strategic Planning Risks

Canada's policies rely on assumptions, international projections, or industry narratives.[113] Canada cannot reliably distinguish between genuine domestic needs, transition-driven requirements, or military demand, nor evaluate extraction-led strategies against alternatives like circular economy measures, substitution, or efficiency improvements.

6.2 Environmental, Social, and Indigenous Rights Risks

Gaps obscure cumulative environmental impacts, long-term liabilities, and tailings risks. Indigenous Nations cannot exercise Free, Prior, and Informed Consent or assess potential harms,[114] undermining Indigenous rights.[115] Lack of data undermines compliance with the *United Nations Declaration on the Rights of Indigenous Peoples* and Canada's environmental commitments.[116,117]

6.3 Governance, Accountability, and Resilience

Opaque data environments concentrate decision-making power in federal and provincial authorities and in industry actors, whose military and industrial priorities may shape outcomes. This reduces accountability by limiting independent scrutiny, weakening democratic oversight, and reducing transparency over material uses.

At the same time, opportunities to improve resilience through efficiency, substitution, and recycling remain undervalued and underfunded, reinforcing reliance on virgin extraction even where alternative strategies could provide lower-risk, socially and environmentally responsible pathways.

7. Key Policy Questions for Canada's "Critical Minerals" Strategy

To develop a credible and evidence-based "critical minerals" strategy, more data is needed so that Canadian policymakers can address several fundamental questions:

7.1 What are Canada's actual "critical mineral" needs?

- What proportion of minerals mined in Canada are exported, consumed domestically, or directed to international supply chains?
- How much lithium, cobalt, nickel, copper, and other "critical minerals" does Canada require to meet domestic priorities such as the energy transition, infrastructure, manufacturing, health care, digital, and military/defence applications?
- Given potential contributions from recycling, efficiency, and substitution, how much new mining is truly necessary to meet Canada's domestic needs? Where do investments need to be made in recycling, demand reduction, and substitution?

7.2 Which sectors should be prioritized?

- What investments and policies are needed to expand domestic refining, processing, and manufacturing capacity in order to ensure minerals support domestic supply chains?
- How should Canada allocate limited mineral supplies among competing uses, including renewable energy, transportation, construction, digital infrastructure, and defence/military uses?
- If traceability is improved, how can Canada exercise greater agency over supply chains and end uses, and prioritize its ore for public interest purposes (such as renewable energy and health care technologies) over destructive purposes (such as weapons and foreign surveillance)?

7.3 How much demand could be reduced? How can we improve circularity?

- What policies could lower mineral demand through efficiency, smaller technologies, alternative transportation strategies, or material substitution?
- What existing funding or policy initiatives could be replicated or expanded to lower reliance on newly mined "critical minerals"?
- If these mined materials are essential to the economy now and into the future, how do we steward them across their entire lifecycle?
- How much of Canada's future mineral demand could be met through recycling, reuse, tailings recovery, and secondary processing?
- What indicators and performance metrics should Canada use to measure progress in reducing virgin mineral demand through recycling, reuse, and material efficiency?

7.4 What environmental and social limits should guide extraction?

- How will Canada measure and manage the environmental impacts, long-term liabilities, as well as impacts on Indigenous rights of expanding mining?
- What governance structures will ensure Free, Prior, and Informed Consent and Indigenous data sovereignty through mineral supply chains?
- What legal mechanisms could allow communities or Indigenous governments to trigger environmental assessments for mining projects or expansions that fall below regulatory thresholds?
- Are governments following through on Canada's biodiversity targets and ensuring significant areas are put off-limits to mining?
- How is Canada ensuring that human rights are being upheld and environmental harms regulated for international processing of its ore and manufactured goods?

7.5 How can supply chains be made transparent and accountable?

- What national reporting standards, data collection systems, and public databases are needed to track production, domestic consumption, recycling, and downstream sectoral applications?
- What national monitoring systems are needed to track battery flows, metal recycling, tailings recovery, and other post-production mineral streams?
- How can Canada track the destination and end-use of minerals once they are exported into global supply chains?
- What policies can Canada put into place to reduce gold mining and other precious metal mining not needed for the energy transition?

At the moment, most of Canada's "critical minerals" ambitions are for more new and expanded mines for export. Answering some of the above questions, will provide more data to inform a strategy that could have Canada better align mineral policy with climate and public-interest goals. This seems particularly important in the face of geopolitical disruptions, trade conflicts, or supply chain shocks.

8. Conclusion: Data as the Core of "Critical Mineral" Strategy

Canada lacks the information needed to fully and credibly define, evaluate, implement, monitor, and adjust its "critical mineral" strategy. While production data for minerals like lithium, cobalt, nickel, and copper is relatively strong, data availability beyond extraction — domestic use, post-production flows, recycling, secondary supply, tailings recovery, and end-of-life flows — is limited. As a result, our strategies rely on international projections, industry narratives, and assumed demand rather than verifiable evidence of actual need or vulnerability.

These domestic data gaps have real consequences. They push decision-making toward expanded extraction with a sense of urgency, while obscuring opportunities for efficiency, substitution, and recycling, and fail to identify actual needs and for what purpose. They also prevent Indigenous Nations and the Canadian public from fully understanding risks and trade-offs. When communities are expected to accept lasting impacts without clear information, meaningful consent is impossible. Data scarcity is therefore both a governance failure and a barrier to evidence-based policy, increasing the likelihood of environmental harm, underestimating long-term liabilities, and eroding public trust.

We know that we need to transition off fossil fuels and that will require more metals and minerals. We know that supply chains have been majorly disrupted by wars, trade disputes, pandemics, and climate disasters. We know defence spending and arms proliferation are increasing, and with that, demand for some of the same minerals and metals needed for renewable energy and electric vehicles. We know that demand is escalating for energy and "critical minerals" for AI data centres and bitcoin mining. We also know that mining is an extractive industry with harmful environmental and social impacts and risks.

While Canada will undoubtedly continue to export mined materials, with better data, maybe we would have public procurement policies to ensure Canadian mined materials are used in Canada's major projects, like steel and copper wire for the federally invested transmission lines. Maybe Canada would set recycled ore content criteria for EV batteries to establish a domestic market and industry that supports circularity and increases security of supply. Maybe communities would be more supportive of certain mining projects if there was traceability and assurance that the mined materials were going toward the energy transition and not to make war missiles or surveillance infrastructure to repress human rights. We may never have all the data — but we currently have such large gaps that Canada's "critical minerals" strategy is not very strategic.

We need to decrease the data gap and broaden our critical minerals strategy to stop prioritizing mining expansion over resilience. Reliable, transparent data and analysis must form the backbone of a responsible, resilient, socially and environmentally accountable "critical mineral" strategy.

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BC MINING LAW REFORM

Design by Erika Rathje