TOWARDS A WESTERN CANADIAN BATTERY VALUE CHAIN

Assessing Industrial Gaps and Opportunities for Economic Development

Executive Summary

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Towards a Western Canadian Battery Value Chain: Assessing Industrial Gaps and Opportunities for Economic Development

Executive Summary

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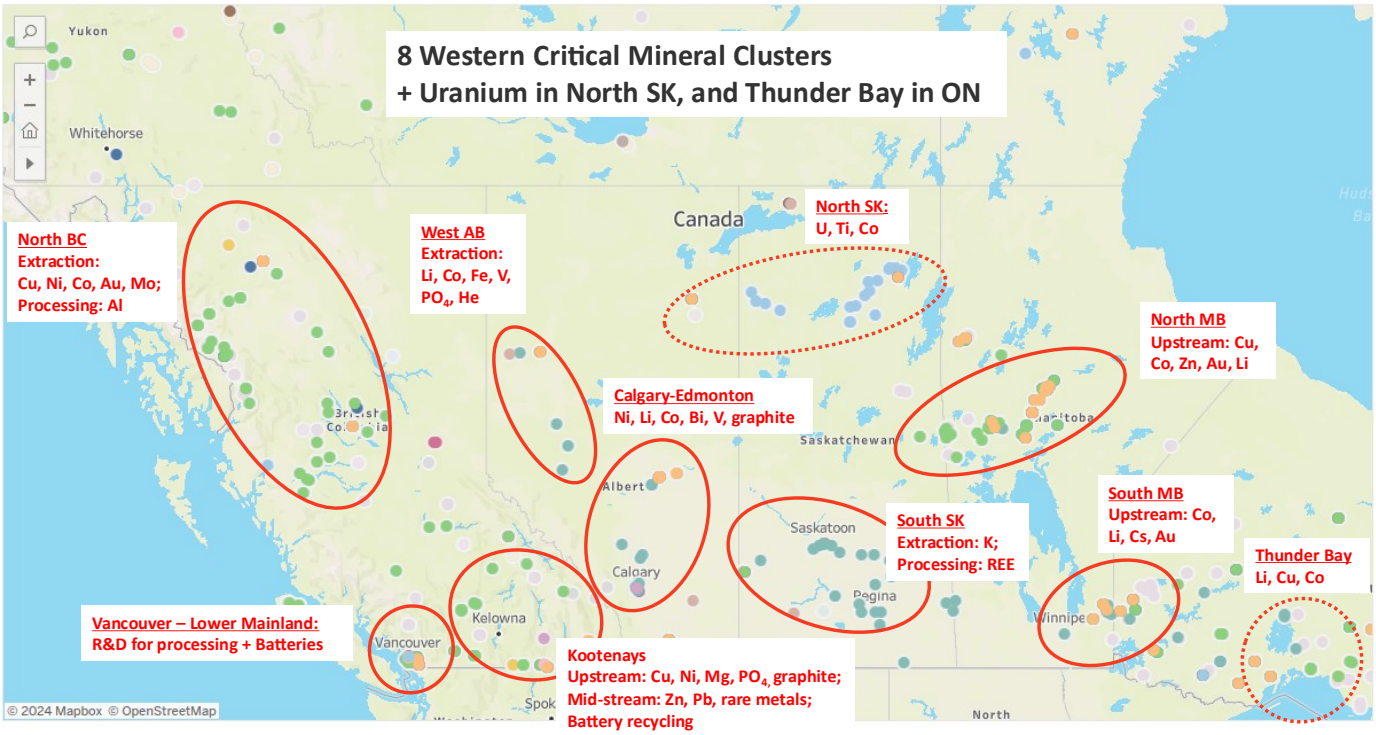
Executive Summary

Western Canada holds significant potential to develop into a globally competitive value chain. This report, informed by extensive industry workshops and government consultations, identifies eight regional industrial clusters in British Columbia, Alberta, Saskatchewan, and Manitoba, and assesses opportunities and gaps across five of the eight identified to build a regionally grounded strategy unlocking the economic potential of Western Canada's critical minerals.

The Regional Industrial Clusters



- **Northern BC:** A remote yet mineral-rich region with strong potential for copper, nickel, gold, and silver, but lacking local processing capabilities. Strategic investments in nickel and copper metallurgy, infrastructure, and workforce training could unlock value-added opportunities and anchor a fully integrated mining cluster in Canada.
- **Vancouver & Lower Mainland**: A clean-tech innovation cluster with strengths in technology development for battery processing, recycling, and potential in manufacturing, backed by top talent and global connectivity. Strategic support for battery manufacturing, local supply chains, electricity access, and scale-up of innovators could solidify its role in Canada's battery value chain.

- **The Kootenays:** With a strong metallurgical base anchored by Teck's smelter, the Kootenays are emerging as a cluster for battery recycling, refurbishment, and niche manufacturing. Future growth depends on diversifying off-takers, upgrading infrastructure, advancing the extraction of different minerals, and boosting R&D in material recovery. Expanding into copper and nickel metallurgy is also a promising path.
- **Western Alberta:** This cluster holds strong potential for lithium extraction from brines, supported by oil and gas infrastructure and a skilled workforce. With additional resources, including iron, phosphate, and vanadium, as well as industrial assets such as the Greenview Industrial Gateway, the region is well-positioned for future midstream development. Unlocking this potential will require access to clean energy, supportive policies, and strong coordination with the Calgary–Edmonton Corridor.
- **Calgary-Edmonton Corridor:** The region is a nationally significant industrial powerhouse with deep strengths in oil, gas, and petrochemicals. Now, it's poised to lead in advanced battery materials. With access to critical feedstocks such as lithium-rich brines, vanadium-bearing fly ash, and synthetic graphite sources, the region is well-positioned to establish Canada's midstream capabilities. By expanding, refining, and focusing on the production of cathode and anode materials, the corridor can become a globally competitive hub for advanced battery materials and processing. Investing in clean energy and talent, as well as boosting industry collaboration, will be necessary.

An Interconnected Vision

Western Canada's battery ecosystem is evolving from a scattered set of industrial nodes into a strategically connected network of regional clusters. Each cluster, from resource-rich regions in the North to advanced material manufacturing clusters in Alberta and battery manufacturing centres in southern BC, has unique strengths that, when integrated, form a complete and resilient battery value chain. Material flows between clusters, from lithium and phosphate to nickel, cobalt, and copper, reveal a powerful opportunity: specialization by region combined with shared infrastructure and collaboration can generate greater collective value than isolated growth.

This interconnected vision takes shape in what we call the "give and go play", a material flow pattern that starts in Northern BC and the Territories, curves through Alberta's industrial heartland for cathode and anode material production, and folds back to Southern BC for battery assembly. Alongside this horizontal flow, the concept of "Bar Down" adds a vertical dimension: a flow of raw materials moving southward from the North, supported by an efficient transport infrastructure. In contrast, clean power and investment flow northward in return. A complementary west-east corridor linking BC's

clean electricity with Alberta's industrial base can further boost the capital competitiveness of cleantech manufacturing. Together, these flows create a full-loop ecosystem centred on circularity, clean technology, and regional synergy.

To succeed, this strategy must be supported by effective coordination among governments, industry, academia and Indigenous communities. With thoughtful planning and strategic project origination, Western Canada can establish a globally competitive battery supply chain that is rooted in sustainability, regional diversity, and economic strength.

Give and Go: An Integrated Western Canadian Battery Value Chain

One illustration of this desirable future Western value chain is a coordinated movement, much like a "**give and go**" play, that flows strategically between regions to maximize value creation. This future network starts in the resource-rich North, moving through central processing in Alberta, and advances to the coastal South for final manufacturing, before circling back through recycling loops. Much like in hockey, where players pass the puck and then move into open space to receive it back, the 'give and go' in this context represents the dynamic, reciprocal flow of materials, expertise, and investment across interconnected regional clusters. This "give and go" is a metaphor and a strategic blueprint that summarizes value chain integration across mining, refining, advanced materials, and battery production in Western Canada.

The play starts in Northern British Columbia, the Territories, as well as the Kootenays, where world-class deposits of nickel, cobalt, copper, graphite, and phosphate will be mined, while at the same time, lithium brine will be extracted from Western and central Alberta. These raw materials are then transformed through metallurgical and chemical upgrading, potentially within the same clusters or sent down to the Calgary–Edmonton Corridor, a region with the potential to emerge as Western Canada's powerhouse for precursor, cathode active materials (CAM), anode production, and critical reagents. Alberta's industrial strength, existing industry and refineries, and innovation hubs make it a natural host for advanced material production.

The final leg of the give and go play brings these engineered, advanced battery materials back west to the Vancouver Lower Mainland, where proximity to international markets, ports, urban infrastructure, and a skilled workforce can support battery cell, module, and pack assembly. With end-of-life batteries flowing back through the system, particularly toward the Kootenays for recycling and refurbishment, the give and go becomes a closed loop, reinforcing circularity and supply chain resilience.

Each cluster specializes in what it does best, and when connected, the collective value created has the potential to exceed the sum of its parts. This metaphor of a give and go is a proposed vision of regional synergy and Canadian leadership in the global battery economy.

Going Bar Down: Building the Vertical Backbone of Western Canada Battery Supply Chain

In hockey, a "Bar Down" goal is a perfect shot that hits the crossbar and drops straight into the net. In Canada's battery value chain, the concept of "Bar Down" captures a similar idea: a clean, vertical flow of materials, from the North to the industrial South, targeted with precision and to support the goal of battery production.

This vertical structure originates in the resource-rich North, specifically in Yukon, Northern British Columbia, and the Northwest Territories, where mining operations are emerging to supply lithium, cobalt, nickel, copper, and rare earth elements. These critical materials must move downward through north-south transport infrastructure and trading corridors, connecting:

- Yukon to British Columbia
- Northern British Columbia to Southern British Columbia
- The Northwest Territories to Alberta
- The Northwest Territories to Saskatchewan

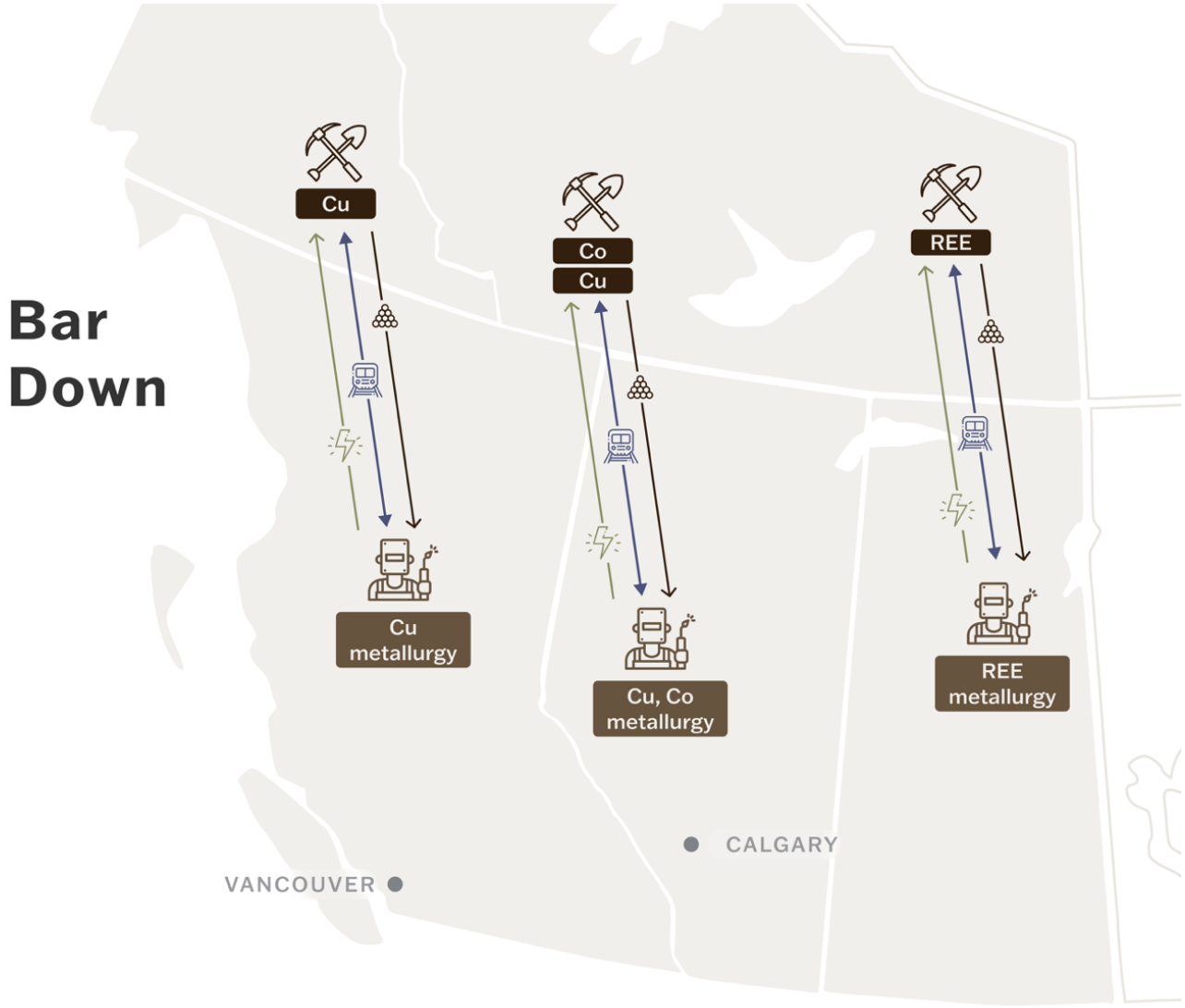
These routes represent the first leg of the give and go value chain, supplying raw materials to the current and future metallurgical processing hubs in Northern British Columbia, the Kootenays, or the Calgary–Edmonton Corridor, and beyond. Investment needs would include road and rail upgrades and expansion, as well as the creation of new infrastructure and transport corridors.

However, just as important is what goes back up: clean energy, grid capacity, and infrastructure investment must move northward, enabling remote regions to electrify their operations, power mining equipment, and create the conditions for full-cycle value creation. The necessary condition for this strategy to go forward is to prioritize supporting local economic development, benefiting the welfare and opportunities of local communities, and strengthening Indigenous reconciliation.

A complementary west-east corridor, integrating the clean hydroelectric grid of British Columbia to the more carbon-emitting Alberta, should also be considered to support the industrial development and capital attractiveness of cleantech in the Calgary-Edmonton Corridor.

This two-way corridor, with resources heading south and energy and infrastructure going north, would have a significant impact on economic development. It would form a resilient backbone for Canada's battery economy, connecting geography with strategy, and transforming regional isolation into national strength.

Bar Down



Material Concentrate

Transport

Electricity

The Need for a Western Canadian Battery Value Chain

Amid rising geopolitical and trade tensions, Canada should move beyond passive resource exports and proactively strengthen its trade position by processing its natural wealth domestically. The value proposition of more rapidly integrating the West and the North into this evolving national value chain is robust and compelling, with numerous benefits for Canada, including:

- **Enhancing Indigenous Economic Reconciliation:** All roads to an integrated value chain for critical minerals and batteries pass through Indigenous lands and it is imperative that the country leverage this generational opportunity to pursue economic reconciliation. The nation has the chance to situate the economic, environmental and social benefits of the evolving value chain and the interests of Indigenous communities at the core of this effort.
- **Increasing Economic Productivity:** A supercharged critical minerals and battery value chain in Western and Northern Canada can help the country get its economy back on the right track with projects that create long-term economic wealth for the country, with upstream mining and midstream processing sectors ripe with innovation potential and high-paying jobs.
- **Minimizing Social, Environmental and Climate Impacts:** In contrast to the emissions- and waste-intensive mining and processing taking place in other parts of the world, Canada can help raise climate and environmental standards for this global sector. By building a midstream processing sector the region can incentivize a demand-side draw for valuable post-consumer materials, versus having to export these recovered metals, chemicals, and black mass, and thereby enhance our national circular economy competitiveness.
- **Strengthening Supply Chain Security:** With an increasing over-concentration of critical mineral production and processing in a select few countries worldwide, Canada's supply chain and businesses are vulnerable to trade war action. This vulnerability allows foreign countries that do not share Canada's interests to potentially manipulate prices and the supply chain to achieve national goals that are contrary to ours. Onshoring this production and processing of the fundamental building blocks of our economy decreases this dependence on foreign actors.
- **Enhancing Sovereignty and Supporting Healthier Communities in the North:** Building-out Canada's northern transportation networks and wealth-generating economic capacity through triple-use infrastructure (i.e. community, industrial, and military) not only builds healthier northern communities, but also projects Canadian northern sovereignty at a time of increased great power competition in the Arctic.
- **Stimulating Industrial Innovation and Specialized Expertise:** Establishing a more integrated supply chain entails developing what could be considered

Western-world leading expertise in advanced metallurgical and chemical processing, fostering innovation in higher-tech applications, and likely leading the world in terms of emissions and waste reduction processes, technologies, and expertise in the chem-tech sector. Developing the region's midstream processing capacity can ultimately increase the technological capabilities of Canada's materials sector and develop specialized knowledge that can be exported to partner nations.

Developing and nurturing this integrated value chain requires a long-term perspective and government leadership in identifying, selecting, and appropriately supporting catalytic projects to move forward.