A Batteries Blueprint for Canada

Canadian Battery Task Force

Sept 2022

As the world shifts away from fossil fuels and we look to electrify our vehicles, our buildings, and our industries, batteries will become the new engines of our economy.

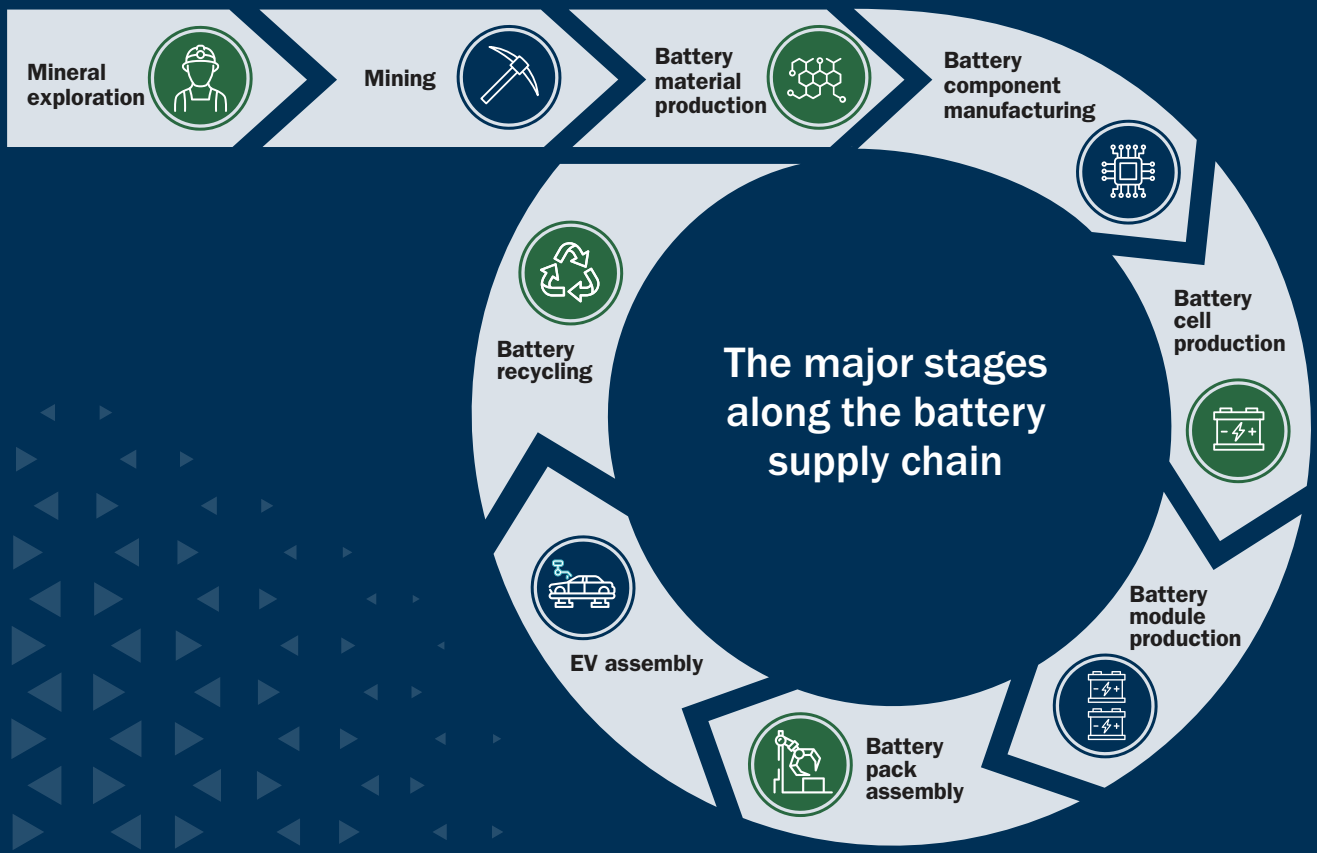
Developing Canada's battery supply chain is vital to maintaining the competitiveness of Canada's major economic sectors—automotive, critical minerals, and advanced manufacturing—and ensuring Canada captures the jobs and value created in the transition to net-zero, while supporting the growth of new jobs and industries in the clean energy economy.

Canada has a chance to establish itself as a major player in the global battery industry, but it must act swiftly and strategically to seize this opportunity. The federal government has acknowledged Canada's "mines to mobility" advantage and has taken steps to support projects along the supply chain. What Canada needs now is a public-facing, national battery strategy that pulls these efforts together, identifies Canada's competitive advantages and where along the battery supply chain it is best-positioned to compete, and guides policies and investments to unlock Canada's top priority opportunities.

This Blueprint offers a starting point for developing a national battery strategy. It focuses on on-road electric vehicles, which are expected to account for the vast majority of battery demand through 2030, but could be expanded to include other battery applications such as off-road vehicles and stationary storage. This Blueprint sets a vision for Canada's battery industry and identifies six goals based on Canada's value proposition and its highest potential opportunities to compete, each with their own near-term (2025) and longer-term (2030) actions.

Our hope is that the federal government—in coordination with industry, labour, academia, and other levels of government—take this Blueprint and develop it further, setting targets for investment and production capacity to scale up activities in the priority areas of the supply chain identified herein. Canadian Battery Task Force members also intend to leverage this Blueprint as a resource when providing input on the broad suite of battery-related federal policy and programs currently being developed.[1]

[1] For instance, Canada's forthcoming Critical Minerals Strategy, Clean Electricity Regulation, Regional Energy and Resource Tables, etc..



Canada's battery value chain must be developed in a way that serves these **national interests**:

- Support good jobs, decent work and healthy communities
- Maximize value-added economic activity within Canada
- Advance Indigenous rights and economic opportunities
- Build supply chain resilience and economic security
- Harness and commercialize Canadian innovation, research and development, and intellectual property
- Unlock Pan-Canadian economic opportunities
- Enhance competitiveness in a global, net-zero economy
- Help Canada and other countries meet climate goals

Furthermore, Canada's battery value chain must be developed in a way that leverages its **competitive advantages**:

- Critical mineral wealth and mining know-how
- Automotive heritage and footprint
- Skilled and talented workforce
- Leading battery research and innovation
- Access to U.S. and other global markets
- Stable, secure ally
- Clean battery advantage and Indigenous, environmental, social, and governance (IESG) leadership

VISION

By 2030, Canada is a global leader in clean, innovative battery technology, strategic materials production and recycling, and is a hub for sustainable battery production in North America

Our vision of a globally competitive battery industry in Canada respects the rights of First Nations, Inuit, and Métis, and enriches their communities in a manner consistent with the United Nations Declaration on the Rights of Indigenous Peoples. Underlying each of the following goals is the understanding that Canada will be positioned for success by proactively working with Indigenous communities to identify opportunities for employment, partnerships, and Indigenous-led ventures in the battery supply chain.

GOAL | 1

Develop the skills and workforce necessary to support the growth of Canada's entire battery supply chain, creating good jobs for Canadians across the country.

Canada is already home to one of the world's top talent pools. But new strategies are urgently needed to engage and mobilize big populations of skilled workers to realize the full value from investments in Canada's EV battery supply chain and keep up with this booming industry. This includes efforts to make Canada a top destination for global battery talent, new strategies to attract and retain workers within Canada, and supporting workers being displaced from other sectors in the energy transition.

Developing Canada's battery supply chain and manufacturing capacity will anchor our existing auto sector and protect jobs as the sector transitions to electric vehicles. Expanding the battery industry beyond vehicle assembly will also make this a pan-Canadian opportunity that supports decent jobs across the country, including in Northern, remote, and indigenous communities.

ACTIONS

By 2025

1. Ensure Canada's workforce is ready to support and scale investments across the battery supply chain by conducting a skills mapping and workforce needs assessment.
2. Make Canada a top destination for battery expertise by marketing Canada's leadership in battery innovation and sustainability, naming new Canada Research Chairs, and streamlining immigration processes for high-skilled workers in key sectors of the battery supply chain.
3. Attract and retain Canadian students and workers into battery-related fields by developing cutting-edge battery programs at post-secondary institutions that focus on applied innovation and creating incentives to pursue battery-related career paths in the country.
4. Ensure auto and other workers, especially Indigenous and workers from sectors impacted by the energy transition, have pathways into the EV and battery industry by developing training programs and directly supporting workers seeking retraining.

Photo credit: Lion Electric Company

GOAL | 2

Swiftly build out the enabling infrastructure necessary (industrial land, clean energy and transportation) to secure additional investments and scale existing ones across the battery supply chain.

Global competition for battery supply chain investments is fierce. Lining up project land and infrastructure needs in advance can help Canada compete for these investments and accelerate project development once we secure them. Similarly, it will be crucial to consider the community readiness for these investments, including housing affordability, workforce availability, opportunities for Indigenous communities, and the provision of critical services like healthcare.

Battery materials and cell manufacturing require serviced industrial land. Significant investments in transportation infrastructure—especially in more northerly regions—are also necessary if Canada is to fully leverage its EV battery minerals capabilities. Finally, maintaining and upgrading electricity infrastructure is vital to the development of an EV battery supply chain (and to more widespread consumer adoption). Clean power is imperative to ensure Canada can claim an IESG advantage in a global market where governments, companies, investors and consumers are increasingly calling for lower-carbon, responsibly-produced goods.

Canada must also find a way to expedite decision-making processes while maintaining world-leading IESG standards if it wants to attract and retain companies along the battery supply chain. While all stages of the supply chain must scale up, extraction and processing is particularly critical due to long lead times.

ACTIONS

By 2025

1. Attract investments and accelerate project development across the battery supply chain by: working with provinces, Indigenous communities, and economic development agencies to develop an inventory of serviced, shovel-ready industrial land in close proximity to labourscheds and production networks; prioritizing battery supply chain activities on this land; and promoting this inventory to investors.
2. Create a predictable and efficient review process for projects across the battery supply chain, including their enabling infrastructure (e.g. clean energy generation and transmission, transportation infrastructure, etc).
3. Ensure Canada maintains its clean battery advantage by working with industry, provinces, and electric utilities to assess the battery industry's power needs and immediately deploy affordable, reliable, clean energy resources and related transmission infrastructure to serve all parts of the battery supply chain, including off-grid mines.
4. Enhance transportation networks that enable new critical mineral and battery supply chain opportunities and improve access to operations already underway by: working with provincial governments to complete a transportation infrastructure needs assessment; incentivizing higher levels of investment into transportation infrastructure; and conducting an expedited review of regulatory requirements relevant to the efficient movement of goods essential to the battery supply chain.

GOAL | 3

Position Canada as a lead supplier of secure, sustainable critical minerals for the North American battery value chain, while exporting to the European market.

Electric vehicle batteries and other clean technologies will be major drivers of future critical mineral demand. By 2040, the International Energy Agency projects demand for critical minerals to grow by at least thirty times to meet rising demand for batteries for use in EVs and storage.[2] Rapid development of additional supply will be required.

Canada is the only country in the Western Hemisphere with known reserves of all the minerals necessary to manufacture EV batteries. This access to metal and mineral resources is a key strength and one of the major value propositions the country can highlight for global companies and investors to attract battery-related investment. Establishing secure sources of such minerals has become increasingly important for Canada and other trading partners in light of recent supply chain disruptions. Proximity to critical metal and mineral reserves is also a big advantage as global companies and ally regions move to localize supply chains, decrease the distance heavy batteries need to travel, and vertically integrate to drive down production costs. Canada's responsibly-sourced resources and clean electricity grid give it a further competitive edge as automakers increasingly look to source ethical materials and reduce emissions across the lifecycle of the vehicles they produce.

[2] International Energy Agency. *The Role of Critical Minerals in Clean Energy Transitions*. May 2021.https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary.

ACTIONS

By 2025

1. Increase the discovery and production of Canadian critical battery minerals—particularly nickel, graphite, and lithium—by publishing an inventory of reserves, attracting clean capital, developing tax incentives and ensuring a timely and efficient federal permitting process.
2. Improve Canadian critical minerals mining and manufacturing investment attractiveness and export opportunities by advancing initiatives that strengthen EV battery mineral supply chains and that advance Canada as a secure source of sustainable battery minerals internationally, including the Canada-US Joint Action Plan on Critical Minerals and the Canada-EU Critical Mineral Alliance.
3. Leverage Canada's sustainable battery minerals potential by demonstrating world-leading IESG standards for mining and deploying clean energy solutions in partnership with Indigenous communities at remote and northern mines.

By 2030

4. Unlock new and alternative sources of critical minerals extraction and processing (e.g. extracting lithium from wastewater brines, recycling) by supporting research and development, particularly for smaller scale pilot projects.

GOAL | 4

Build a globally competitive, clean battery materials industry in Canada, maximizing the use of Canadian mineral and recycled material inputs.

Creating an integrated battery materials manufacturing industry—in which Canadian-mined minerals are refined and processed into EV battery materials, and recycling hubs are clustered nearby to form a closed-loop system—is one of Canada's biggest and most unique opportunities.

Battery materials are high-value and easy to export. Building capacity in Canada's midstream would fill a key gap in the North American battery supply chain and set Canada up to serve global markets, as global supply is likely to be constrained. A strong Canadian midstream would also support both upstream and downstream supply chain development, providing direct clients for Canadian mining and recycling companies.

Battery material manufacturing is a costly, energy-intensive process. Canada's proximity to critical mineral inputs, cutting-edge battery recycling technologies, and a clean electricity grid offer key advantages for companies to cut costs, improve efficiencies, and produce some of the cleanest battery materials in the world. Leveraging Canada's research and development strengths can help keep global companies here for the long-term and encourage new Canadian firms to scale up in this industry.

ACTIONS

By 2025

1. Secure investments into Canada's midstream by proactively seeking out and prioritizing these projects in government funding decisions, with an emphasis on projects that offer domestic up- and downstream linkages.
2. Make Canada a leading producer of cathode active material to the North American market by leveraging investments to-date and advancing innovative research and production lines.
3. Assess Canada's competitiveness in producing other high-value electrode active materials and precursors.
4. Scale up Canadian companies that cut costs, reduce environmental impacts, and integrate recycled content into battery materials production by clustering key industry stakeholders and academic institutions into one hub to support testing, demonstration, and the commercialization of new processes and technologies.

Photo credit: Lithion Recycling

GOAL | 5

Make Canada a centre for North American clean battery innovation, cell design, and cell manufacturing.

EV battery cell manufacturing facilities are large and highly productive. Each of these facilities has the potential to serve as a transformative investment for the community or region in which it is located. Cell manufacturing facilities also anchor other stages of the EV battery supply chain, such as battery component and module manufacturing, and are considered to be catalysts for EV assembly and other value-added activities.

Canada has focused on attracting multinational battery cell manufacturing companies to set up facilities within its borders. This has helped to secure at least one transformative investment that put Canada on the battery cell map. The next step will be to leverage these investments, along with Canada's low-carbon critical minerals and clean power, to develop domestic battery manufacturing capacity that specializes in clean battery cell production. Domestic battery manufacturing champions are more likely to use local suppliers, engineers, scientists, sales managers and Canadian-developed battery technology. They can help validate and commercialize Canadian inputs and innovation. Scaling up domestic companies and research and development will enhance Canada's battery value chain resilience and serve the country's long-term economic, environmental, and security interests.

ACTIONS

By 2025

1. Build homegrown cell manufacturing capacity by ensuring technology and skills transfer are part of foreign direct investment efforts and improving access to government funding envelopes for Canadian-based battery companies.
2. Position Canada to produce the cleanest batteries in the world by boosting clean energy supply, maximizing recycled content, and developing a globally-recognized clean battery label.
3. Support Canadian companies in becoming global leaders by: helping them develop, commercialize, and scale up innovations in battery chemistry, design, and manufacturing; focusing the mission of the Advanced Manufacturing Supercluster on batteries; and advancing intellectual property protection strategies.

By 2030

4. Secure further battery cell investments from global companies by: proactively shoring up serviced industrial land with an affordable and reliable supply of clean power; ensuring the Canadian workforce has the skills necessary; and helping foster the connections between cell manufacturing and Canadian-produced metals and battery materials.

GOAL | 6

Grow the EV battery market in North America.

Rather than seeking to build an advanced battery industry and supply chain in North America while demand for batteries is still centered off-shore, Canada must also support the growth of a robust regional market to ensure there is sufficient demand for EVs, batteries, and their input materials and parts in North America. EV uptake in North America currently trails other markets like the EU and China. Shifting a greater proportion of global EV and battery demand to North America therefore needs to be a priority.

Canada is currently home to ten light-duty vehicle assembly plants, a number of which plan to assemble EVs in the near future. Canada is also home to several MHDV manufacturers—located across Manitoba, Quebec, and Ontario—and most already produce hybrid or EV models. These existing assembly plants, workforce, parts manufacturing facilities, and supplier networks provide an important competitive advantage. Vehicle assembly activities also serve as catalysts for further activities along the battery supply chain and are important sources of research and development and process innovation. Canada must continue to leverage existing assembly plants to incentivize additional investments across the supply chain.

ACTIONS

By 2025

1. Make Canada a leading jurisdiction for EV deployment by putting in place key government incentives and procurement policies, and by building out the necessary infrastructure to support widespread EV adoption.
2. Strategically invest in scaling up Canadian leadership and innovation in other battery applications, including commercial, off-road vehicles, aerospace, and marine.
3. Secure EV mandates for all existing light-duty vehicle assembly plants and seek out investments in new greenfield assembly facilities by prioritizing zero-emission manufacturing opportunities in government funding decisions, and continuing to market Canada's clean battery advantage abroad.

By 2030

4. Secure an increased share of the battery-electric truck manufacturing industry in North America by targeted vehicle and infrastructure incentives and supporting the build-out of the necessary manufacturing capacity.

Individuals and organizations that participated in this process

The Canadian Battery Task Force brings together experts from across the battery supply chain—including mining, battery manufacturing, vehicle parts and assembly, labour, academia, and battery recycling. Its mission is to advance Canada's domestic battery industry.

Members:

Moe Kabbara
Co-chair
Accelerate

Joanna Kyriazis
Co-chair
Clean Energy Canada

Warren Ali
Auto Parts Manufacturing Association

Matt Beck
Battery Metals Association of Canada/Delphi Group

Angelo DiCaro
Unifor

Daniel Breton
Electric Mobility Canada

Patrick Gervais
Lion Electric

Sarah Houde
Propulsion Quebec

Jean-Christophe Lambert
Lithion Recycling

Brendan Marshall
Mining Association of Canada

James Meadowcroft
Transition Accelerator

David Paterson
GM Canada

Frank So
E-One Moli Energy (Canada)

Soeren Striepe
Magna International

Brendan Sweeney
Trillium Network for Advanced Manufacturing

Simon Thibault
Investissement Québec

Adrian Tylim
Blue Solutions

Observers:

Michael Gullo
Business Council of Canada