



# Keeping the “Know” in Nova Scotia:

The facts about lithium  
mining & battery  
recycling in Nova Scotia

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# The facts about lithium mining and battery recycling in Nova Scotia

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As the Nova Scotia government considers exploring lithium mining as a means to contribute to the green energy transition, environmental and economic challenges need to be considered. The concentrations of lithium in Nova Scotian deposits are low but come with high costs such as environmental degradation caused by mining.

There are sustainable alternatives for economic growth in lithium that do not involve mining. The Ecology Action Centre recommends the provincial government invest in lithium battery recycling instead. The lithium battery recycling industry offers economic growth and job creation and aligns with global sustainability trends while preserving Nova Scotia's natural resources and agricultural lands.



## Background on lithium mining

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Lithium is a transition mineral in the global push for cleaner technologies, especially in electric vehicles (EVs) and renewable energy storage. Demand for lithium in recent years has surged. Major producers Australia, China, and Chile meet the majority of global demand (International Energy Agency 2024).

Both the Government of Canada and the Province of Nova Scotia recognize lithium as a “critical mineral” and are considering promoting mining it as part of the green energy transition (Government of Canada 2024, Province of Nova Scotia 2024).

However, there are significant drawbacks to lithium mining in Nova Scotia that must be considered before the province moves forward with extraction. These barriers highlight why Nova Scotia should instead prioritize lithium battery recycling over the mining of lithium.

# Key issues with lithium mining

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## Low lithium concentrations

Initial surveys in Nova Scotia indicate that lithium concentrations are relatively low, making mining operations economically unviable. Studies found that the median lithium concentration in groundwater from bedrock aquifers was 8 µg/L, with a maximum of 398 µg/L, making the concentrations economically unfeasible for mining operations (Nova Scotia Department of Natural Resources and Renewables 2018). As a result, the cost of extraction would likely outweigh the benefits.

## Environmental impacts of mining

Lithium mining is resource intensive, requiring large amounts of water and energy while also generating polluted water and contaminated soil. The environmental risks of lithium mining, including habitat destruction, water depletion and long-term pollution, are substantial (Kelly et al. 2021, Vera et al. 2023). These risks are particularly concerning given the location of lithium deposits in the Annapolis Valley — one of Nova Scotia's most fertile agricultural regions. Mining in this area could disrupt farming activities, degrade soil quality and jeopardize food production, posing long-term negative impacts on the economy and environment (Valley Ren 2022).

## Key issues with lithium mining (continued)

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### **Challenging bedrock conditions**

Nova Scotia's bedrock conditions are another major obstacle. Much of the province is covered by thick glacial till, which makes it difficult to access the underlying bedrock and extract valuable minerals. Drilling through these layers would require significant energy and resources, making lithium mining both costly and environmentally damaging (CTV News 2023). These conditions further undermine the economic feasibility of lithium extraction in the province.

### **Low revenue generation**

A typical form of revenue from mining is royalties paid to governments by the companies that mine within the government's land base. Currently, lithium is not a mineral for which royalties are collected by the Province of Nova Scotia (Province of Nova Scotia 2018).

# Lithium battery recycling

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Given the environmental and economic challenges associated with lithium mining, it is recommended that Nova Scotia shift its focus to lithium battery recycling. This approach offers several advantages:

## **Environmental sustainability**

Lithium battery recycling is far less harmful to the environment. Up to 95 per cent of the materials in a battery, including lithium, cobalt and nickel, can be recovered and reused (TheDriven.io 2023). This promotes a circular economy and aligns with global sustainability trends.

## **Economic growth and job creation**

The growing demand for EVs and energy storage systems will drive the need for lithium battery recycling. Nova Scotia is already a global leader in battery research and development through initiatives like the [Dalhousie Renewable Energy Storage Laboratory](#) and the [Jeff Dahn Research Group](#). These researchers work to repurpose used batteries from retired EVs to increase battery life – with the latter on the cusp of developing a [million-mile EV battery](#). Investing in a battery recycling industry could complement this work and create long-term, high-quality jobs in the recycling sector, positioning Nova Scotia as a leader in an expanding market (Lohum 2023).

# Lithium battery recycling

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## **Preserving natural resources and agricultural land**

By focusing on recycling rather than mining, Nova Scotia can preserve its agricultural lands, contributing to the province's long-term environmental and economic health. The Annapolis Valley, for example, plays a crucial role in the province's food production, contributing \$2.2 billion to the province's GDP (Sector Profile, 2021).

## **Keeping up with the rest of Canada**

Several of the largest battery recycling plants in North America operate in Canada, including Lithion Recycling's plant in Montreal, QC and Cirba Solutions plant in Trail, B.C. Provincial policy can encourage these initiatives; Quebec has partnered with automakers to create a new industry-funded EV battery recovery program, while B.C. will obligate vehicle manufacturers to recover and recycle all of their own batteries when the vehicle owner doesn't want that battery (Yakub, 2023).

## Recommendations

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Nova Scotia has a unique opportunity to lead in the green energy transition and create jobs by prioritizing lithium battery recycling over mining. Given the economic challenges posed by low lithium concentrations and the environmental risks associated with mining, recycling offers a more sustainable and profitable alternative. To support this, the province should invest in building infrastructure for lithium battery recycling, including research and development, waste collection programs, and state-of-the-art recycling facilities. Government incentives and public-private partnerships can further drive innovation and attract investment in this sector, creating long-term jobs and fostering technological advancements. This approach will not only support a cleaner future but also stimulate economic growth and job creation while protecting the province's natural resources.



# References

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- Government of Canada. 2024. Canada's critical minerals. Accessed February 12, 2025: [canada.ca/en/campaign/critical-minerals-in-canada/critical-minerals-an-opportunity-for-canada.html](https://canada.ca/en/campaign/critical-minerals-in-canada/critical-minerals-an-opportunity-for-canada.html)
- Government of Canada. No date. Lithium Facts. Accessed February 12, 2025: [natural-resources.canada.ca/minerals-mining/mining-data-statistics-analysis/minerals-metals-facts/lithium-facts](https://natural-resources.canada.ca/minerals-mining/mining-data-statistics-analysis/minerals-metals-facts/lithium-facts)
- International Energy Agency. 2024. Global Critical Minerals Outlook 2024 – Lithium. Accessed February 12, 2025: [iea.org/reports/lithium](https://iea.org/reports/lithium)
- Jarod C. Kelly, Michael Wang, Qiang Dai, Olumide Winjobi. 2021. Energy, greenhouse gas, and water life cycle analysis of lithium carbonate and lithium hydroxide monohydrate from brine and ore resources and their use in lithium ion battery cathodes and lithium ion batteries. Resources, Conservation and Recycling, Volume 174, 2021, 105762: [doi.org/10.1016/j.resconrec.2021.105762](https://doi.org/10.1016/j.resconrec.2021.105762).
- Province of Nova Scotia. 2018. Mineral Resources Regulations made under Section 156 of the Mineral Resources Act. Accessed February 12, 2025: [novascotia.ca/just/regulations/regs/mrregs.htm](https://novascotia.ca/just/regulations/regs/mrregs.htm)
- Province of Nova Scotia. 2024. Nova Scotia's Critical Mineral Strategy. Accessed February 12, 2025: [novascotia.ca/natr/meb/docs/critical-minerals-strategy.pdf](https://novascotia.ca/natr/meb/docs/critical-minerals-strategy.pdf)

## References (continued)

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- Vera, M.L., Torres, W.R., Galli, C.I. et al. 2023. Environmental impact of direct lithium extraction from brines. *Nat Rev Earth Environ* 4, 149–165: [doi.org/10.1038/s43017-022-00387-5](https://doi.org/10.1038/s43017-022-00387-5)
- World Economic Forum. 2023. This chart shows which countries produce the most lithium. Accessed February 12, 2025: [weforum.org/stories/2023/01/chart-countries-produce-lithium-world/](https://weforum.org/stories/2023/01/chart-countries-produce-lithium-world/)
- United Nations Development Programme. 2022. Lithium in Latin America: A New quest for "El Dorado"? Accessed February 12, 2025: [undp.org/latin-america/blog/graph-for-thought/lithium-latin-america-new-quest-el-dorado](https://undp.org/latin-america/blog/graph-for-thought/lithium-latin-america-new-quest-el-dorado)
- Valley Ren, "Agriculture and Agri-food Sector Profile," 2022: [valleyren.ca/wp-content/uploads/2022/02/Agriculture-Agrifood-Sector-Profile.pdf?utm](https://valleyren.ca/wp-content/uploads/2022/02/Agriculture-Agrifood-Sector-Profile.pdf?utm)
- Nova Scotia Department of Natural Resources and Renewables, 2018: [novascotia.ca/natr/meb/data/mg/ofm/pdf/ofm\\_2018-003\\_dp.pdf](https://novascotia.ca/natr/meb/data/mg/ofm/pdf/ofm_2018-003_dp.pdf)
- CTV News, "Challenges of Lithium Mining in Nova Scotia," 2023: [ctvnews.ca/atlantic/nova-scotia/article/nova-scotia-clears-way-for-lithium-exploration-after-land-dispute/](https://ctvnews.ca/atlantic/nova-scotia/article/nova-scotia-clears-way-for-lithium-exploration-after-land-dispute/)
- Lohum, "The Economic Benefits of Battery Recycling," 2023: [lohum.com/media/blog/the-economic-benefits-of-battery-recycling-turning-waste-into-valuable-resources/?utm](https://lohum.com/media/blog/the-economic-benefits-of-battery-recycling-turning-waste-into-valuable-resources/?utm)

## References (continued)

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- TheDriven.io, 2023. "95% Battery Recycling Recovery Rate Achieved." [thedriven.io/2023/03/03/ev-battery-recycler-hits-95-recovery-rate-in-world-first-collection-program/](https://thedriven.io/2023/03/03/ev-battery-recycler-hits-95-recovery-rate-in-world-first-collection-program/)
- Agriculture & Agri-food, Sector Profile for Annapolis Valley, October 2021: [valleyren.ca/wp-content/uploads/2022/02/Agriculture-Agrifood-Sector-Profile.pdf](https://valleyren.ca/wp-content/uploads/2022/02/Agriculture-Agrifood-Sector-Profile.pdf)
- Yakub, Quebec, 2023. industry partners debut EV battery recovery program: [electricautonomy.ca/news/2023-07-25/ev-battery-recovery-program-quebec/](https://electricautonomy.ca/news/2023-07-25/ev-battery-recovery-program-quebec/)