

October 7, 2022

Standing Committee on Environment and Sustainable Development
House of Commons Canada
131 Queen Street, Room 6-39
Ottawa, ON K1A 0A6

RE: Clean Technologies in Canada

Li-Cycle appreciates the opportunity to contribute to the Standing Committee on Environment and Sustainable Development’s study on Clean Technologies in Canada.

Li-Cycle is an industry leader in North America for lithium-ion battery recycling and is on a mission to leverage its innovative Spoke & Hub Technologies™ to provide a customer-centric, end-of-life solution for lithium-ion batteries, while creating a secondary supply of critical battery materials. Founded in 2016 and headquartered in Toronto, ON, Li-Cycle opened its first mechanical pre-processing Spoke facility in Kingston, ON in 2020, capable of processing up to 5,000 tonnes of lithium-ion batteries annually. Since then, Li-Cycle has expanded into the United States and has opened Spokes in Rochester, New York, and Gilbert, Arizona, with an additional Spoke opening in Tuscaloosa, Alabama in fall 2022. Additionally, Li-Cycle has recently announced its first expansions into Europe with Spokes in Norway and Germany expected to be operational in 2023. Once operational, Li-Cycle will have a total processing capacity of up to 30,000 tons of lithium-ion batteries per year in North America and 20,000 tons per year in Europe.

Additionally, Li-Cycle’s first hydrometallurgical refinery ‘Hub’ facility is undergoing construction in Rochester, NY and is on track for commissioning in 2023. The Rochester Hub will process up to 35,000 tons per year of black mass and produce a range of critical materials, including battery grade nickel sulphate, lithium carbonate, and cobalt sulphate. Once completed, the Rochester Hub will be the one of the largest facilities and sources of recycled lithium in the world.

The Standing Committee’s study on Clean Technologies in Canada has set out to report on “clean technologies being researched, manufactured, and utilized in Canada to reduce greenhouse gas emissions and reduce harms to the environment” and “how Canadian clean technologies can be used to reduce global emissions”. Li-Cycle is pleased to give our perspective as a Canadian clean technology company in the lithium-ion battery recycling industry.

The Need for a Sustainable Lithium-ion Supply Chain

With the transition to the green economy and the adoption of electric vehicles, global lithium-ion battery demand has risen exponentially over the past 10 years, and it is only just beginning.

With increased demand for lithium-ion batteries, we face new challenges that need to be managed. To meet the production needs for lithium-ion batteries there may be shortages of domestic sources of critical minerals such as lithium, cobalt and nickel needed to produce these batteries. In addition, there will be increased manufacturing scrap from producing batteries and waste from batteries when they reach their end-of-life stage. To prevent lithium-ion batteries from ending up in landfills and to ensure that their critical minerals do not go to waste and will end up back in the supply chain, there is a need for scalable, environmentally friendly recycling solutions to address critical mineral shortages and circularity. In addition, promoting circularity in the critical minerals supply chain through the recycling and recovery of minerals, such as those found in lithium-ion batteries of EVs, consumer electronics and manufacturing scrap, can help the critical minerals supply chain reduce its ecological footprint.

Li-Cycle's Spoke & Hub process improves upon traditional battery recycling methods and can achieve up to a 95% recycling efficiency rate of constituent materials, including battery grade lithium carbonate, nickel sulphate, and cobalt sulphate. Importantly, Li-Cycle achieves these results with an environmentally friendly process that requires no thermal processing, has no wastewater production, zero impact air emissions, and minimal solid waste. In comparison to traditional pyro/thermal recycling processes and the impact of mining and refining production for one tonne of battery materials, Li-Cycle's process has a CO₂ emission offset factor of 40-67% and a water usage offset factor of 97%. Once fully scaled, Li-Cycle will deliver a truly closed-loop recycling solution for the global battery supply chain and a strategic secondary supply source of critical battery materials.

Recommendations

Recycling is set to become a significant source of critical minerals in the coming decade as the first electric vehicles start to enter their end of life. It is imperative for Canada to position itself to best take advantage of this generational opportunity to be a global leader in supplying sustainably produced critical minerals, and recycling can help the supply chain be more environmentally friendly.

To meet green energy demands, investments need to be made across the lithium-ion battery supply chain, beginning with primary extraction and all the way to the eventual end-of-life battery recycling. Although the Government of Canada is generous with investments in R&D to develop Canadian IP and is supportive of companies in their initial startup and scaling of their businesses, significant investments and incentives need to be made to encourage companies in the lithium-ion battery supply chain to commit to building North American facilities in Canada. The United States is currently making strong investments in the battery supply chain, such as through the Bipartisan Infrastructure Law and the recently signed Inflation Reduction Act, so it is important for Canada to offer additional incentives to encourage investments domestically.

We suggest increased funding opportunities are offered to support the commercialization and scale-up of battery recycling technologies rather than opportunities to fund earlier-stage

research and development. We believe this would more accurately reflect the stage which Li-Cycle and other North American battery recyclers are operating at today, as the industry works to scale their operations in the coming months and years.

For the recycling industry, attracting investments across the battery supply chain is particularly important as Li-Cycle tries to build our Spokes and Hubs in locations close to clusters of existing battery manufacturers and OEMs. This is primarily to cut down on transportation costs as spent batteries are flammable and hazardous materials and are regulated in Canada as a dangerous and/or a hazardous goods, depending on the province. To facilitate ease of logistics and transportation from the customer to Li-Cycle, we strongly consider locating our facilities in areas with a high concentration of lithium-ion batteries. Developing geographic ecosystems of battery manufacturers, OEMs, and recycling facilities within Canada is critical to creating a sustainable lithium-ion supply chain capable of meeting Canada's green energy needs.

Closing remarks

Developing a robust domestic clean technology sector in Canada will be instrumental in Canada's transition into the green economy in the coming years. As part of this, the creation of a circular lithium-ion battery supply chain with an emphasis on recycling will be crucial for Canada to position itself as a global leader in green energy and to ensure the sustainable development of a domestic critical mineral supply chain able to fuel Canada's clean energy needs. Li-Cycle is encouraged that the Standing Committee on Environment and Sustainable Development is moving forward with a study in the clean technologies in Canada and we welcome and look forward to engaging with the committee on its study from the perspective as a recent Canadian clean technology start-up that has scaled up into an industry leader in North America.

Sincerely,

Richard Storrie

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Regional President, Americas

Li-Cycle Corp.