

**Building Back Better with Critical
Minerals and Associated Value
Chains in Canada**

**Essential to meeting the growing food, technological and
clean energy needs of the world's growing population**

*Written Submission for the
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**“Building Back Better with Critical Minerals and Associated Value Chains in Canada”
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Chair Maloney and Members of the Standing Committee on Natural Resources.

The Saskatchewan Mining Association (SMA) appreciates the opportunity to provide input to the Committee’s study on ***Critical Minerals and Associated Value Chains in Canada***. Prior to the global pandemic, there was already an opportunity for Canada to rise to the challenge of addressing two of the most pressing global challenges; climate change and increased global population growth, though the continued responsible production of Canada’s vast mineral wealth and its existing and emerging value chains. The pandemic has further illuminated the necessity and benefits of having secure and reliable value chains to manufacture the goods and services required for domestic consumption and security, and the opportunity to expand those value chains to provide secure and reliable products to our global trading partners.

Canada has limited domestic markets for our mineral production and has long been a world-leading net exporter of sustainably produced minerals. Consequently, in the Committee’s study, it is imperative to retain a global perspective of Canada’s opportunity to grow global value chains. Coming out of the pandemic, the global demand for critical minerals is increasing to support the transition to a low carbon, global economy, and to support the growing global population, estimated to reach 10 billion people by 2050, that are living on a reduced amount of arable land and available water supply. Successful implementation of Canada’s Critical Mineral Strategy is an opportunity for Canada to fulfill its policy initiatives to improve global health, climate and food security outcomes.

The Saskatchewan Mining Association (SMA) is the voice of the exploration and mining industry in Saskatchewan representing over 40 companies and has the role of liaison with governments and the public to advance the sustainable development of Saskatchewan’s mineral resources. As the world’s leading potash producer (~33%), and second leading producer of uranium (13 – 20%), Saskatchewan’s mineral industry is already a global force in helping meet the growing food, health, technology and clean energy needs of the world’s growing population – and has the capacity to contribute even more.

Both potash and uranium are included in Canada’s Critical Minerals List as they are essential to Canada’s economic security, are required for Canada’s transition to a low-carbon economy and are a sustainable source of critical minerals for our trading partners.

The exploration and mining sector is a major sector of Saskatchewan’s economy, annually contributing approximately \$7 Billion to Saskatchewan’s GDP. It directly and indirectly annually employs over 25,000 people and purchases over \$5 Billion of goods and services. The industry is proportionally the largest private sector employer of Indigenous people in Saskatchewan (21% of all direct mine employees are Indigenous) and is also the largest customer of Indigenous-owned businesses in Saskatchewan, annually purchasing over \$650 M in goods and services.

Exceptionally strong safety, environmental, social and governance performance are integral to the activities of SMA members.

Our recommendations support **“Building Back Better with Critical Minerals”** through a cleaner and more inclusive growth of the mineral sector and value chains. They support the Government’s priority commitments of advancing to net-zero emissions by 2050, growing the middle class, advancing food sustainability and security, improving the socio-economic conditions for Indigenous communities, and both strengthening and diversifying existing and emerging trade relationships. The recommendations are aligned with the 6 Pillars of the *Canadian Minerals and Metals Plan* and are primarily focussed on the critical minerals potash and uranium and their value chains.

Our recommendations would enhance the exploration and production of Canada’s Pan Canadian mineral industry in rural and remote parts of Canada while fostering development of additional value chains in urban Canada, all while enabling Saskatchewan’s mineral production to continue to provide clean energy, technology and food security to growing global communities while continuing to deliver benefits to Saskatchewan and Canadian communities.

SMA Recommendations to Enhance Canada’ Critical Minerals and Associated Value Chains:

Recommendation 1: Fortify and Resource the Critical Minerals Strategy

Recommendation 2: Prioritize Investment in Critical Minerals Value Chains:

Recommendation 3: Strengthen & Align Existing and Emerging Trade Relationships

Recommendation 1: Fortify and Resource the Critical Minerals Strategy:

To realize the opportunities related to Canada’s critical minerals and the global, value-added supply chains, Canada’s Critical Minerals Strategy must be fully developed, supported and resourced so that it is both **internal (domestic)** and **external (export)** facing. This recognizes the opportunity to develop more reliable domestic value chains (eg. BEV battery manufacturing, clean nuclear energy, agronomic products), and also recognizes the essential role that Canadian mineral production has in providing other parts of the growing world population with products they need to improve their quality of life, including clean, reliable energy and food security.

With the world’s population estimated to reach 10 Billion by 2050, global agriculture production will have to increase by about 60-70 percent from the current levels to meet the [increased food demand¹](#) in 2050. World [energy consumption²](#) will also grow by nearly 50% between 2018 and 2050. This increased food and clean energy productivity, on a diminishing land and water base, can only be achieved through the appropriate application of fertilizers, including potash, and clean baseload power options, such as nuclear power. Canada and Saskatchewan have an opportunity to sustainably contribute to these global food and clean energy security transitions through the production of potash

and uranium, both identified as Critical Minerals.

Developing Canada's Critical Minerals List is a first step. However, to realize the potential of Canada's critical mineral endowment, supportive and coordinated policies must be undertaken with a "whole of government" and integrated approach. If we have the raw resources, but aren't able to access them, or bring them into production in a timely and predictable manner, investment will migrate to jurisdictions that have developed an integrated approach to the critical minerals value chain.

To fortify and resource Canada's Critical Minerals Strategy we recommend the following:

- Supporting Geoscience to map, identify and research Canada's critical mineral potential. These qualitative mineral resource assessments would better inform land management decisions including the Protected Areas Strategy
- Attracting Investment for Mineral Exploration & Mining through tax incentives
- To facilitate consultation and engagement, fund indigenous communities to conduct traditional mapping of their respective territories, including mechanisms to appropriately share information.
- Increasing investments in digital infrastructure, including installation of high-speed internet in rural and remote areas to provide access to education, health and business opportunities for Indigenous communities and support digitalization of the mining sector.
- Re-establishing enhanced tax write-offs for capital investments in the mining sector, which have been eroded over the past decade.
- Increasing investments in downstream laboratories and pilot plants, such as the SRC Rare Earth Element Processing Facility, that will enable manufacturers to readily access the materials required for their manufacturing processes.
- Harmonize regulatory processes for critical minerals in areas of shared federal-provincial jurisdiction, and areas of shared common and strategic international interest (eg. Joint Canada – US Action Plan on Critical Minerals), This will allow critical minerals projects to proceed in a more timely and predictable manner.
- Collaborate on research, innovation and commercialization related to critical minerals and their value chains.

Recommendation 2: Prioritize Investment in Critical Minerals Value Chains

A. Support Research, Innovation and Commercialization of Agri-food and Nuclear Value Chains

Canada, and Saskatchewan in particular, is a global player in the production of potash and uranium, which are feedstock to the agri-food and nuclear value chains. They are instrumental in improving food and clean energy security and health outcomes of the world's growing population.

i. Critical Mineral Potash and Agri-food Chain

Approximately 95% of potash produced worldwide is used as a key component of fertilizer for agriculture. The rest is found in several other industrial uses, including glass manufacturing, soaps, plastics and pharmaceuticals. The fertilizer industry plays an essential role in Canada's economy, contributing over \$23 billion annually and employs 76,000 workers throughout the supply chain.

[\(Fertilizer Canada\)³](#)

In Saskatchewan, potash mining directly employs 5100 people with a payroll of over \$1 Billion. Potash has been in the top 5 minerals produced in Canada for over a decade. In 2020, potash sales from Canada were valued at \$5.5 Billion.

Potash is somewhat unique in terms of a direct value-added supply chain as the majority of the potash is mined and refined prior to leaving the minesite. It is directly shipped by rail for export overseas or into the United States as a major component of fertilizer. A relatively small amount of potash does undergo additional refinement into premium products. Potash is one of the leading commodities shipped by both CN and CP, who, along with port facilities and their respective employees, receive tremendous benefit from the bulk shipment of potash.

The agriculture sector is undergoing rapid, complex, and disruptive technological changes to meet the challenge of helping to grow the food needed to feed 10 Billion people by 2050. With up to 60% of crop yield dependent on crop nutrition, developing performance fertilizers that enhance digital agriculture, increase quality crop yield and build plant resilience to climate change are areas of emerging and growing expertise in the potash value chain. Potash-producing companies operating in Saskatchewan are already in innovative Pan-Canadian research partnerships with institutions including the University of Saskatchewan College of Agriculture and Bioresources, the Global Institute of Food Security, the Ontario Agricultural College at the University of Guelph; Faculty of Agricultural and Environmental Sciences, McGill, Queens and Dalhousie Universities and Protein Industry Canada, one of Canada's 5 innovation superclusters. Growing the agri-food research capacity and downstream manufacturing of precision agricultural equipment represent expanding opportunities for the potash value chain.

ii) Critical Mineral Uranium and Nuclear Value Chain

Many members of the current Standing Committee on Natural Resources, will be very familiar with Canada's nuclear sector given the robust work of the Committee contained in their June 2017 report, [The Nuclear Sector at a Crossroads: Fostering Innovation and Energy Security for Canada and the World⁴](#). This report made 7 recommendations to the Government, all of which supported expansion of Canada's nuclear sector. These recommendations were subsequently supported by Government's response to the report ([Government response to the Fifth Report of the Standing Committee on Natural Resources⁵](#)), and which ultimately led to NRCan's [SMR RoadMap⁶](#). The Committee's report was prescient in recognizing Canada's world-leading expertise and reputation in the nuclear sector, and how Canada could leverage this expertise to capture future opportunities in the nuclear supply chain.

As recognized in the Committee's report, and subsequent work of NRCan, nuclear technology is an integral part of any advanced, low carbon economy. In addition to providing emissions free, baseload energy production, nuclear technology supports medicine, materials science, advanced manufacturing, and food safety. The nuclear industry directly and indirectly supports a total of 60,000

Canadian jobs, most of which are high-tech and very well paid. Over 200 Canadian-owned companies supply products and/or services to the nuclear industry. In Saskatchewan, uranium mining directly employs over 1800 people with an annual payroll of over \$241,400,000. This includes over 1200 employees who are residents of Saskatchewan's primarily indigenous, northern communities. In 2020, over \$328 Million of goods and services were purchased from Saskatchewan companies, and since 1991 northern uranium mining operations have paid over \$5 Billion to indigenous employees and indigenous-owned companies⁷.

The vast majority of uranium produced in Canada is used to power nuclear reactors that provide clean nuclear energy in Canada and abroad, in countries including United States, France, China, Japan, Russia, South Korea, Ukraine, United Kingdom and Sweden.

- 1 in 10 homes in Canada, and 1 in 17 homes in the United States is powered by uranium produced in Saskatchewan. (NRCAN, SMR RoadMap slidedeck).

Nuclear energy and its value chain is already a Pan-Canadian industry:

- Uranium mining and milling occurs in Saskatchewan
- Nuclear power stations generate 15% of Canada's electricity; all of it non-emitting, including 60% of Ontario's power and 36% of New Brunswick's power.
- Refining, conversion, fuel fabrication and manufacturing value chains in Ontario (Blind River, Port Hope, Coburg, Toronto)
- Research reactors are located in Ontario and Quebec

Canada's Nuclear Supply Chain is already a significant economic force in Canada, annually contributing:

- \$17B to the economy;
- 76,000 total jobs.
- \$1B uranium exports;

Nuclear energy is currently a strategic asset for Canada.

- Canada has leveraged its nuclear leadership for significant strategic, economic, and scientific benefit for the past 60 years.
- Canada's expertise and supply chain are internationally recognized as world-class.
- 30 CANDU reactors are operating around the world – representing 5% of global installed capacity.
- In Canada alone, nuclear energy annually displaces over 50 megatonnes of greenhouse gas emissions as compared to coal or natural gas.

Small Modular Reactors (SMR) represent the next wave of nuclear innovation for Canada

- The advancement of Small Nuclear Reactors (SMR) will help Canada achieve its net zero by 2050 emissions targets, stimulate innovation and spur on post Covid-19 economic growth by adding more value to the already existing Pan-Canadian nuclear supply chain.
- SMR represent the next-generation of clean nuclear technologies.

- SMR are relatively small nuclear reactors designed to be built economically in factory-like conditions, similar to the automotive industry, (rather than fully constructed onsite), with capacities ranging from 1 to 300 MWe.
- The deployment of SMR in Canada would further significantly reduce greenhouse gas emissions since nuclear would, in many cases, replace fossil fuel generation, including natural gas, as SMR's can be integrated with intermittent renewables (solar and gas) that require natural gas back-up.
- NRCan's [SMR RoadMap](#) identified 3 markets for SMR in Canada and the global export market:
 1. On-grid Power (150 – 300 MWe) –provide electricity as a replacement of coal-fired generation; integration with intermittent renewables that require natural-gas back-up.
 2. Resource/Heavy (10 – 80 MWe); - provide heat and electricity, reducing mine energy costs by 20- 60%
 3. Remote communities (1 – 10 MWe) – provide heat and electricity

Adding Value to the Pan-Canadian Nuclear Supply Chain through SMR

- Canada has an immense opportunity to realize in the development and commercialization of SMR, driven by climate change mitigation, energy security imperatives and the opportunities SMR provide in highly populated areas where energy density is a key consideration.
- NRCan's [SMR RoadMap](#) has indicated that an early leadership position could secure a significant share of the projected \$400 to \$600 billion global market for SMR technology.
- In Canada, SMRs could yield up to \$19 B in total annual economic impact between 2030 and 2040, creating 6000 new highly skilled jobs related to mining, refining and manufacturing.
- Canada has already exported CANDU nuclear reactor technology to six other countries and could be the centre of the export market for SMR.
- Canada could also be the centre of innovative international nuclear research, with Canadian Nuclear Laboratories (CNL) anchoring the emerging high technology nuclear subsector.
- Canadian industrial companies could deploy Canadian SMR technology in domestic and international operations for both heat and electricity generation.
- Given the modular manufacturing component of SMR, countries that are first to market in SMR development and commercialization will receive the greatest benefit in the SMR value chain.
- Other countries that utilize nuclear power, including USA, UK, China, Russia, S. Korea and Argentina, are quickly moving to capture the SMR Value Chain.

Laying the groundwork for capturing the SMR Value Chain

As reported in NRCan's [SMR RoadMap](#), Canada is well-positioned to lead and capture the SMR value chain as enabling frameworks are in place, including:

- World-class regulator, regulatory framework and expertise in the Canadian Nuclear Safety Commission
- World-class uranium deposits in Saskatchewan continue to be discovered, securing the critical raw resource to fuel SMR.
- World-class supply chain, including indigenous-owned companies involved in the mining, milling, power generation and potentially manufacturing and operating sectors.

- Trade – Canada has preferential market access to export SMR technology as it has trade agreements with 2/3 of the global economy, (USMCA, CPTPP, CETA) all of which already generate nuclear power.
- Public opinion towards SMR as a technology to advance GHG reductions is very positive – 86% of Canadians are open to, support or strongly support SMR in Canada.

B. Financial levers to incent the transition to SMR Clean Technology

- In their pre-budget submission, the Canadian Nuclear Association proposed that the government invest \$643 million to develop both on-grid and off-grid SMR's over the next five years. We recommend that the Standing Committee on Natural Resources support this direct investment as it will lower emissions and help achieve net-zero emissions by 2050, particularly in regions like Saskatchewan that are transitioning from an existing high-carbon intensity grid. The Net-Zero Accelerator Fund is one-such enabling funding mechanism. Direct investment will help position Canada at the forefront of capturing the global economic and environmental benefits of the SMR value chain that will be realized by early adopters.
 - SMR will enable the electrification of heavy GHG-emitting industries such as resource extraction, steel, cement and fertilizer manufacturing. Funding SMR development and commercialization will support the long-term global competitiveness of these sectors that already provide direct and indirect (value chain) high quality careers, notably to Indigenous people and businesses, community investments and revenues to governments. This transition would make Canada home to the cleanest mills, mines and factories in the world.
- In addition to direct investment, tax incentives that encourage investment in SMR technology would also be a tool to advance the electrification of Canadian resources industries.

Recommendation 3: Strengthen and Align Trade Agreements with Existing and Emerging Markets

- Through existing trade agreements, (USMCA, CPTPP, CETA), Canada already has preferential market access to export home-grown agri-food and nuclear technology with 2/3 of the global economy, who are already importers of potash and uranium value chains from Canada.
- Canada's record as a world-leading mineral producer with leading ESG performance is a part of Canada's global brand and is of critical benefit to Canada.
- The geopolitical considerations of the critical minerals value chain are immense, particularly as most global competitors that produce potash and uranium are state-owned enterprises (SOE). These entities take advantage of the unlevel economic playing field, including reduced environmental, social and labour standards to gain market share. As energy-intensive, trade-exposed industries (EITEI), Canada's mineral producers are price-takers and have to absorb added costs that their competitors aren't subject to.
- We recommend existing and new trade agreements promote and leverage Canada's reputation as a reliable and secure value chain of critical minerals and their products.
 - This includes consideration of a carbon-border adjustment mechanism for countries that do not put a price on carbon and that consequently benefit from carbon leakage from countries like Canada who are making efforts to lower emissions.

- A carbon-border adjustment would help counter the issue of the decreasing competitiveness of Canadian mining operations that already produce product with less emissions than their global counterparts, but who are facing higher costs than their competitors.
 - As an example, Canadian potash is made with approximately 50% fewer emissions than global competitors, such as Russia and Belarus, who do not pay a price on carbon. If Canadian mines are unable to be cost-competitive, the world will still consume potash, but it will be produced by SOE and have twice the GHG emissions than potash produced in Canada; a lose-lose proposition. Global emissions will increase while Canada loses the economic and social value chains generated with domestic production.
- Evidence of current carbon leakage was revealed in the signing of international potash contracts between the Belarusian Potash Company and both [China](#)⁸ and [India](#)⁹. As noted by Canpotex, these contracts are both significantly below the current market levels for potash in key offshore markets and are a complete disconnect from the current strong market fundamentals for major agricultural commodities for which potash is a critical input.

Canada's Critical Minerals and Value Chain Strategy, fortified with the appropriate policy, regulatory and financial support, is a once in a generation opportunity that will elevate Canada's reputation as a global leader in addressing two of the most pressing global challenges; climate change and the transition to a net-zero emissions economy, and increased global population growth by 2050.

Thank you for the opportunity to provide the SMA's perspective on how Canada can leverage its reputation and expertise as a reliable, secure and sustainable supplier of critical minerals and their value chains both domestically and internationally.

We would be pleased to meet with you to further discuss any of these recommendations.

Yours truly,



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cc. Honourable Seamus O'Regan, Minister of Natural Resources Canada
Honourable Jim Carr, Special Representative for the Prairies
Honourable Marie-Claude Bibeau, Minister of Agriculture and Agri-Food
Honourable Mary Ng, Minister of International Trade

References:

1. Fertilizer Canada website <https://fertilizercanada.ca/about/>
2. Feeding the world in 2050 and beyond – Part 1: Productivity Challenges; Michigan State University Extension <https://www.canr.msu.edu/news/feeding-the-world-in-2050-and-beyond-part-1>
3. US Energy Information Administration: EIA projects nearly 50% increase in world energy usage by 2050, led by growth in Asia <https://www.eia.gov/todayinenergy/detail.php?id=41433>
4. The Nuclear Sector at a Crossroads: Fostering Innovation and Energy Security for Canada and the World, RNNR Committee Report <https://www.canpotex.com/news/canpotex-statement-reported-china-potash-settlement>
5. Government Response to the Fifth Report of the Standing Committee on Natural Resources <https://www.canpotex.com/news/canpotex-statement-reported-china-potash-settlement>
6. Natural Resources Canada: Canadian Small Modular Reactor: SMR Roadmap <https://www.eia.gov/todayinenergy/detail.php?id=41433>
7. Benefits from Northern Mining 2018 Summary <https://pubsaskdev.blob.core.windows.net/pubsask-prod/113928/Current-Benefits-from-Northern-Mining-Summary.pdf>
8. Canpotex Statement of Reported China Potash Settlement <https://www.canpotex.com/news/canpotex-statement-reported-china-potash-settlement>
9. Canpotex Statement on Reported Indian Potash Settlement <https://www.canpotex.com/news/canpotex-statement-reported-indian-potash-settlement>

