



Comments on and responses to the discussion
paper “Canada’s critical minerals strategy”

Submitted to the Critical Minerals Centre for
Excellence at Natural Resources Canada

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1. PREAMBLE

The Québec Mining Association (the "QMA" or "Association") was founded in 1936 and speaks for all mining companies producing metals and minerals, their constituent mines, metallurgy companies, mining contractors and junior mining companies in Québec. Suppliers, non-profit organizations, institutions and other mining sector partners can also become members of the QMA. Its mission is to promote, support and proactively develop a responsible, committed and innovative mining industry in Québec while its vision is to be a leader and an indisputable reference for a responsible, innovative and competitive mining industry in Québec, within a sustainable development perspective.

To become a member of the QMA, a company or organization must undertake to comply with its values of:

- Respect
- Transparency
- Responsibility
- Teamwork

The QMA, with its focus on the environmental, social and economic aspects of mining, has made a genuine commitment to sustainable development. In 2014, the QMA joined the *Towards Sustainable Mining* (TSM) initiative developed by the Mining Association of Canada. Since then, all mining companies that are members of the Association have been required to join, and comply with, the TSM initiative. The QMA has also adopted a sustainable development charter for mining companies working in Québec, a charter for its members and developed by its members. The QMA also adopted guidelines on relations with Indigenous communities.

2. INTRODUCTION

The Québec Mining Association welcomes this consultation launched by Natural Resources Canada (NRCan) for the drafting of Canada's critical minerals strategy. It remains ready and willing to help ensure that Canada and Québec can become key players in the development of critical minerals and their associated value chains.

The QMA wishes to inform NRCan that it was involved in the discussions organized by the Québec government in late 2019 and early 2020, which covered some of the same ground as the current process initiated by NRCan's Critical Minerals Centre for Excellence. The consultation led to the publication of the *Quebec Plan for the Development of Critical and Strategic Minerals* (QPDCSM), published in the fall of 2020, which received a positive reception from Québec's mining industry.

To provide the government with as much insight as possible, the QMA conducted its own consultation, focusing on members that are currently developing mine projects in Québec to target deposits of critical and strategic minerals. It also consulted members already in production of metals and minerals essential to the energy transition and the development of the critical and strategic minerals (CSMs) sector.

For the QMA, it is clear that the development of value chains for critical minerals supports the goal of maintaining a strong mining industry here over the long term. CSM development in Canada will lead to a diversification of the Canadian mining sector and make it less sensitive to cyclical effects.

On this point, a study commissioned by the Québec Mining Association to look at mining in Québec in 2020 shows that all regions of Québec, as well as Canada, profit from the mining industry's presence in Québec. It generates the following economic benefits:

- **\$2.42 billion** of fiscal and parafiscal revenue paid to the two levels of government, including **\$620 million** to the **Government of Canada**, excluding corporate income tax.
- **\$12.5 billion** total economic activity in Canada, including
 - \$3.5 billion in the Abitibi-Témiscamingue region
 - \$3.2 billion in the Côte-Nord region
 - \$1.3 billion on the Island of Montréal
- **65,284 person-years of employment** (direct, indirect and induced) created or maintained in Canada, including
 - 15,589 person-years in the Abitibi-Témiscamingue region
 - 7,585 person-years in the Côte-Nord region
 - 3,834 person-years in the Montérégie region
- **an average annual wage of \$110,000** in mine operations
- **6,143 suppliers in Canada** and 4,857 suppliers in Québec, including
 - 1,483 in the Abitibi-Témiscamingue region
 - 906 on the Island of Montréal
 - 556 in the Montérégie region
- **a \$12.9 billion** contribution to Canada’s GDP
- **Over \$25 million paid to Indigenous communities** in Québec in 2020 (based on our estimate and data made public on SEDAR).

As this data shows, Canada and Québec cannot afford to ignore the importance of mineral development in their respective territories. However, it is important for both levels of government to create an environment conducive to development, in particular by encouraging the development of the CSM sector and proposing a structuring Canadian strategy.

The government must demonstrate courage and vision to ensure that Canada takes, and holds, a leading role worldwide. It has the mineral deposits and mining expertise needed to achieve this goal and to succeed, with help from all players acting in a coordinated and concerted fashion.

3. RESPONSES TO THE DISCUSSION QUESTIONS

This section contains the QMA’s responses to the questions in the discussion paper “Canada’s critical minerals strategy”.

3.1 Prioritization and Areas of Focus

[Do you concur that the value chains identified and their associated minerals offer Canada the greatest opportunities for economic growth?](#)

Canada’s critical minerals list

The QMA submitted comments in January 2021 concerning Canada’s critical minerals list.

It can only reiterate that the Canadian government must ensure that the critical and strategic minerals identified by the provinces and territories are included on the Canadian list. Because the minerals identified may change over time, it is important for the Canadian list to reflect this.

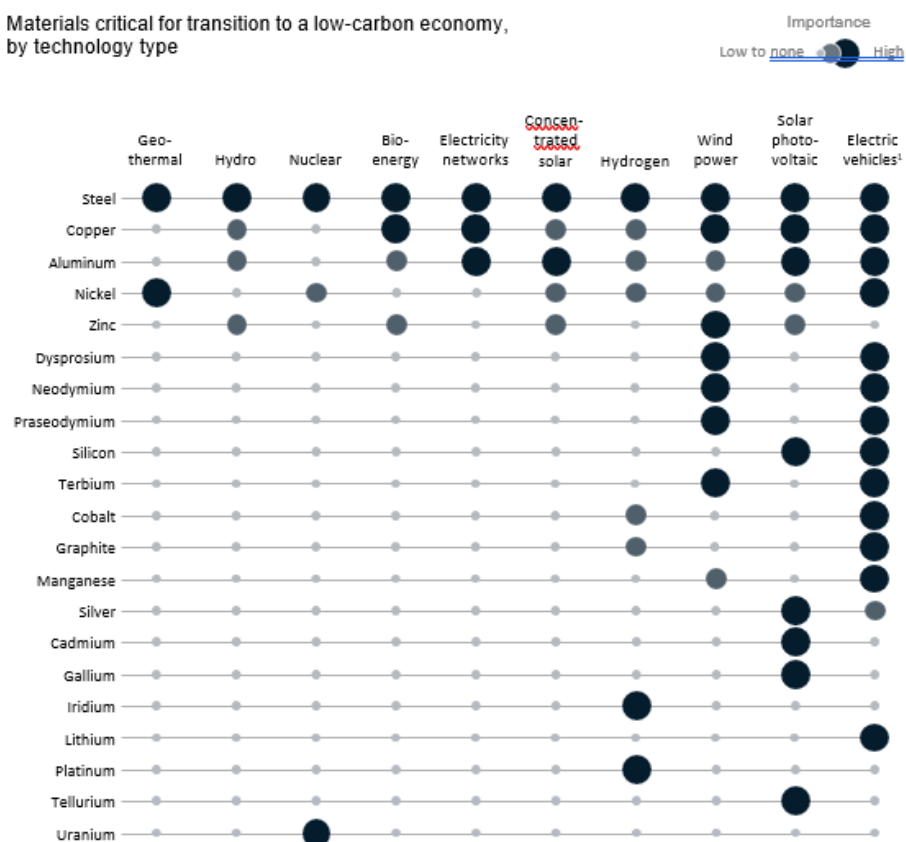
In the view of the QMA, one of the main items overlooked on the lists of critical minerals is the high-purity iron ore found in Québec, in particular in the Labrador Trough.

High-purity iron ore from the Labrador Trough

It has been demonstrated on several occasions, by various bodies, that the worldwide energy transition and the decarbonization of the economy will require extremely large quantities of steel. The illustration below, taken from an analysis by McKinsey, shows how steel, the main product made from iron, is a critical material and is essential for the manufacture of key technologies for the energy transition, including wind generators, hydroelectric dams, photovoltaic panels, electric vehicles and geothermal facilities.

While steel will be crucial as an infrastructure enabler for all technological transition, specific elements will play an important role in each technology.

Materials critical for transition to a low-carbon economy, by technology type



¹includes energy storage.
Source: Critical raw materials for strategic technologies and sectors in the EU, A foresight study, European Commission, Mar 9, 2020; The role of critical minerals in clean energy transitions, IEA, May 2021; McKinsey analysis

Several other countries in the world possess extensive iron ore reserves, including Australia, Brazil and China, but this is not the high-purity iron ore found in particular in the south of the Labrador Trough. It is used to produce a high-grade iron ore concentrate, while almost all the other ores on the international market are low-grade ores. In addition to playing a key role in the manufacturing of technologies to decarbonize the economy, high-purity iron ore helps steel production facilities reduce their greenhouse gas (GHG) emissions compared to low-grade ore. This unique iron ore has few

impurities (manganese, alumina, phosphorous, titanium, etc.), making it the ore of choice for direct reduction processes.

The steel industry faces a major challenge. The production of one tonne of steel generates 2.01 tonnes of CO₂ emissions, making it one of the most carbon-intensive industries in the world, and it accounts for almost 8% of the planet's GHG emissions.

Since the signing of the Paris Agreement in 2015, the steel industry has been in a race against time to reduce its carbon footprint, and the situation is amplified by:

- the increased demand for low-carbon products;
- an increasingly strict regulatory framework in many countries;
- increased pressure from investors and the general public.

Decarbonization is a priority issue for steel producers, not only to remain competitive, but also to retain the right to operate in an increasingly strict regulatory environment. McKenzie & Company consider that steel producers can lose up to 14% of their value if they fail to reduce their environmental impact.

Throughout the world, a growing number of steelworks are announcing major investments to replace blast furnace processes with direct reduction processes and electric arc furnaces, allowing them to make a significant reduction in their GHG emissions. However, the direct reduction process requires high-grade concentrate which, used in direct reduction with electric arc furnaces, reduces the CO₂ emissions from steel production by 45%.

Only high-grade concentrate can be used in the direct reduction process, in which steel is made in electric arc furnaces. The reduction of the iron ore concentrate relies on natural gas, or possibly green hydrogen, rather than coal. In addition, more recycled steel can be added to the process, a significant factor in the steel value chain.

Electric arc furnace technology has a double advantage for the climate. It taps cleaner energy sources and maximizes the use of recycled steel in the process, while eliminating the use of coal.

Québec and Canada clearly have a world-leading advantage in the decarbonization of steel production, thanks to the use of high-purity iron ore from the Labrador Trough. In addition to producing the high-grade iron ore sought by green steel producers, Québec's iron ore mines are powered by hydroelectricity, further reducing the carbon footprint of the steel produced from the ore.

To give Canada the best possible chance for economic growth, it is recommended that the federal government's current critical minerals list be extended to include high-purity iron ore, which will play a central role in the worldwide energy transition and the reduction of Canada's GHG emissions.

Canadian value chains

To reduce economic dependency on other countries and give Canada the best possible chance for economic growth, complete value chains must be set up within Canada, in particular for the critical metals initially targeted for development: lithium, graphite, nickel, cobalt, copper and the rare earth elements. These Canadian value chains must include circularity loops, placing more emphasis on the circular economy at various points in the chain, and involving more than just recycling.

Considering all the mines and processing facilities that already exist, as well as the mine projects under development, Canada is in a prime position to take the lead on the world stage. Canadian value chains will increase trade with other countries, counting both imports of recyclable materials and exports of raw or processed minerals.

The battery value chain

Québec currently has one temporarily closed lithium mine. It also has around a dozen mine projects in development, one for copper, two for graphite, five for lithium, one for nickel and three for rare earth minerals, all destined to supply the battery value chain. Some of these projects are in advanced stages:

- Nouveau Monde Graphite began work in 2021 to construct a graphite purification plant and another plant to produce anode materials for lithium-ion batteries;
- Nemaska Lithium is developing a project to operate its lithium mine and transform the ore into lithium hydroxide for the production of battery components;
- Sayona owns a lithium mine, in care and maintenance, with a lithium carbonate production plant and has two other potential projects. It plans to build a processing plant to transform spodumene into lithium carbonate and has not ruled out the possibility of producing lithium hydroxide.

Following the release of the *Quebec Plan for the Development of Critical and Strategic Minerals* (QPDCSM) in fall 2020, the Québec government published a Québec strategy for the development of the battery sector (*La Stratégie québécoise de développement de la filière batterie*), which targets:

- the extraction and processing of minerals in Québec to manufacture battery components including anodes and cathodes;
- the production of commercial electric vehicles;
- the development of battery recycling using leading-edge Québec technologies.

By developing the battery sector, the Québec government plans to stimulate demand for CSMs from Québec. The increased demand will lead to more value-added processing in Québec, based on the development of value chains.

In the QMA's view, Canada's critical minerals strategy must be based on the initiatives already taken by the provinces and territories. Québec and Ontario have already established their positions and begun to develop the battery value chain. The Canadian strategy must promote synergy between the stakeholders.

3.2 Drive Research, Innovation, and Exploration

[What are priority areas for research programs \(academia, industry, governments\)?](#)

Support for research

First, the QMA welcomes the \$144.4 million budget commitment to promote research and development on critical minerals, along with the deployment of technologies and materials to support the critical minerals value chains.

To prioritize research fields, the government must begin by reviewing the current situation in terms of research and development (R&D) on CSM value chains. It must analyze each element and ensure that all the links requiring further knowledge are targeted by research projects. It would be beneficial for the government to map existing value chains to identify gaps in knowledge and technological expertise in order to draw up programs to support businesses as they develop.

CSMs are currently a focus of development around the world, and leading-edge expertise is also dispersed across various countries and regions. Links must be established between research institutes and centres (both public and private) to facilitate transfers of technological knowledge.

The government must also make an effort to ensure better coordination between research centres and government-funded projects. To maximize the gathering of knowledge from R&D, projects must be consolidated to promote synergy between research centres and companies. In other words, the QMA supports a pooling of effort to maximize the use of infrastructures as well as financial and human resources.

To avoid duplication, the government must introduce benchmarking for R&D projects. In many cases, companies prefer to conduct their own R&D projects instead of relying on research centres, in particular because of confusion about which centres perform which operations. The government must also do more to promote its own R&D programs, which are often poorly understood in the business community.

The QMA recommends the establishment of a genuine dialogue between the various players planning to extract and process CSMs, to ensure that projects proceed cooperatively rather than in parallel. For example, if two companies are working with a research centre to develop a new technology, their efforts can be combined in a single research project to maximize the chances of success. This will also reduce risks and allow a more judicious use of capital, especially when projects are in the development phase and generating little revenue. Once a technology has been developed, each company involved can use it to advance its own project.

Every technological development involves financial and technical risks. On the financial side are the investments required to develop and acquire a new technology or innovation, and the risk of cost overruns. On the technical side are the risks associated with the time needed to introduce an innovation and reach the desired level of performance, and the potential for defective or failed technology or inappropriate use. To encourage mining companies to invest more in innovation, they must be offered ways to reduce the risks. A program is needed to mitigate the technological and financial risks associated with innovation, through tax credits, fiscal incentives, venture capital, the certification of equipment, and so on.

Mine project promoters have highlighted the need for R&D to design and improve processes to extract and process several CSMs, including lithium and the rare earth elements. Such processes exist and are applied, in particular in China, where environmental standards and regulations are less exacting than in Canada. However, the processes do not meet Canadian standards and, if they were modified to bring them into compliance with our environmental legislation, would involve extra costs that would make them uncompetitive. More R&D investment is needed to develop new processes and improve and fine-tune CSM extraction and processing methods.

Last, the government must create programs specifically linked to the pre-commercial development of vertically-integrated projects (extraction and processing), with financial support for the pilot and demonstration phases. In the specific context of critical and strategic minerals, the finished product must be of high quality. To obtain financing prior to the commercial phase, the quality of the finished product must be demonstrated, along with the feasibility of the extraction and processing methods used and of production in real-life conditions. However, there are currently very few programs to support such projects. Those that exist are financially limited and do not apply to projects of between \$5 and \$10 million in the pilot phase or between \$20 and \$40 million at the demonstration phase. In addition, considering the current research ecosystem, it would be useful for the QMA to develop pilot and demonstration infrastructures that could then be made available for development projects.

In short, the government must support R&D projects, innovation projects, pilot projects and demonstration projects, taking advantage of what already exists and avoiding duplication.

What more should be done to drive critical mineral exploration and innovation?

Exploration

To stimulate exploration, the new exploration tax credits must be maintained.

The first information needed about a CSM or any other ore is whether or not it is present, which is why exploration is so important. However, the exploration industry is facing three key challenges: access to public land, social acceptability and the availability of financing.

Québec has rich deposits of CSMs, some of which are world-class. This is a clear advantage for the province but access is needed in order to benefit from them. Exploration is an essential step in discovering the mines of the future, and steps must be taken to facilitate access to public land and reduce the barriers to exploration. The main barriers that must be removed include the following:

- Land claims
 - The industry needs the government to support companies in their relations and discussions with communities and local groups to allow exploration to proceed;
- Increasingly strict requirements concerning social acceptability
 - The mining industry believes that mine projects must be developed in a way that respects the host community. However, some groups are trying to extend the concept of social acceptability to give the population a power of life or death over the project. The government would be making a mistake if it moved in this direction. The process for deciding the social acceptability of a mine project is not a referendum and, ultimately, the government must rule on whether or not it is acceptable in its current form;
- Withdrawal of land from disposal order (protected areas, etc.)
 - Since the exclusion of land from sale reduces access to exploration zones, Canada has become less attractive and companies look elsewhere in places where they have greater access to public land. The government must take care before excluding land from possible sale;
 - In recent years, many jurisdictions have made a commitment to prohibit economic development in large parts of their land base. The scientific basis for these commitments is not always clear. It is essential to ensure that mineral potential is taken into account in the exclusion process to ensure that stakeholders, rights holders and governments have all the data they need to make such decisions;
- The lack of access infrastructures (roads, airports, ports, railways, etc.).

In addition, to support the discovery of new mineral deposits and ensure that promising projects can advance, governments must improve and add stability to the process for gathering and disseminating public geoscientific knowledge and data. This data provides the basic information needed by exploration companies to locate zones with favourable mineral potential and make enlightened decisions. The government must therefore invest more in data acquisition.

The government must also improve its knowledge of CSM sources. It must conduct assessments of mineral resources and support exploration and the development of conventional sources (mines), secondary sources (recycled materials), and less conventional sources (mine tailings sites and by-products from mines and ore processing plants). Many active mines are already optimizing the development of their deposits by using extraction processes that generate several different products.

More optimization is possible. In addition, optimization reduces mine waste and at the same time reduces the environmental footprint of mine facilities.

To achieve this goal, the government should implement programs to help active mines identify and develop processes to extract all possible resources from a deposit and generate value from by-products.

Supporting innovation

The ecosystem for innovation at the pan-Canadian level includes several organizations that target only some of the elements in the mining sector value chain. The range of organizations, their business models, which are sometimes similar but often different, their complementarity and their occasional duplication, are all factors that make it difficult for mining companies to have access to innovation. Similarly, several organizations work at the regional level, while the mining industry and the issues it faces are nationwide, and even worldwide. Too many research and development organizations and innovation bodies in Canada drain funding and investment from the public and private sectors for similar projects. These organizations sometimes compete rather than collaborate.

The government should create a strong ecosystem and take advantage of the organizations able to provide leadership. They include COREM, in Québec City, which covers all areas of expertise relating to ore treatment and has a critical mass of experts working, or ready to work, at the national level. Complementarity in the value chain (exploration, extraction, processing, waste management) is a prerequisite for the creation of this ecosystem.

The key to collaboration, to promote innovation and do away with the current fragmented approach in the mining sector, is government financing and the creation of dedicated innovation funds for the mining industry.

The provincial and federal governments must adopt a joint approach in order to coordinate their efforts and reduce current overlaps. They must establish adapted funding programs that require collaboration and resource sharing, and should no longer encourage duplication and the waste of capital.

It would be a mistake for the government to duplicate infrastructures simply to stimulate regional economic development, robbing Peter to pay Paul. Existing research centres are performing well. Instead of creating new centres to address the same problems, it is important to consolidate the existing centres and extend their expertise. This is the only way to maximize the use of the public funds dedicated to R&D and ensure the coherent development of the CSM sector.

Enhancing the adoption of new technologies

The legislative and regulatory framework is not evolving quickly enough to deal with new technologies, and this situation is delaying, or slowing, the introduction of new technologies and technological innovations. To help the mining industry gain more advantage from opportunities to innovate and invest in innovation, it is important to:

- Establish technology watch and regulatory monitoring groups to ensure more effective scanning of emerging technologies and suggest regulatory amendments in response;
 - Systematically review proposed new regulations, as well as existing regulations, to ensure that they are focused on the target results rather than on the means of attaining them;
 - Ensure that all new regulations are drafted in a way that does not prevent the use of new technologies.
- Create a government investment program to facilitate the implementation of innovations (new technologies, artificial intelligence, green technologies, etc.);

- Establish a program to reduce the technological and financial risks associated with the adoption of innovations (tax credits, fiscal incentives, venture capital, equipment certification, etc.).

Adoption of innovations to support currently operating sites

To place their operations on a sounder footing, mining companies tend to rely on well-known technologies to reduce the risk of their projects, knowing that each new innovation and new technology embodies a level of risk. After a few years, it will be possible to include innovations one by one. The programs must reflect this reality, since the cost-effectiveness of technological innovations is greater for facilities that are already operating.

3.3 Accelerate Project Development

[How can we streamline the regulatory processes to better facilitate project development?](#)

The QMA has repeatedly highlighted the fact that policies and measures must be put in place to help promoters plan and implement their projects within a reasonable and predictable timeframe. They must be able to take advantage of windows of economic opportunity to launch their projects.

While respecting its commitments to protect the environment and the health of workers and the general population, the government must introduce simplified administrative procedures to authorize projects as quickly as possible. This has been done in the United States by introducing accelerated authorization processes for CSM projects.

In terms of time limits, the rules must be clear, and governments should not have the option of changing them. For the mining sector, it is important for impact assessments to be completed at a suitable time. Windows of opportunity are small, and it is important to be able to launch a project in favourable market conditions. Long, unforeseen delays may mean that projects never see the light of day.

A way to facilitate project development is to reduce the administrative burden created by regulations and the project authorization process. Are all the documents and reports that must be filed with the government strictly necessary?

The environmental authorization processes for mine projects subject to both provincial and federal regulation are not harmonized. There is no effective coordination, and the conclusions may be different and even contradictory. The levels of government must communicate more with each other, and establish official and formal mechanisms for communication and discussion to avoid the current silo mentality. The federal government's push to modernize the environmental authorization process is a clear example of the silo approach, and the same is true at the provincial level. In the final analysis, promoters must do everything twice and also make the connections between the two levels of government.

The provincial and federal ministers responsible for natural resources and environmental protection must work together to ensure that no pointless intergovernmental conflict or unrealistic assessment process discourages investment in Canada.

The mining industry can only reiterate that there must be only one environmental authorization procedure, and even a single point of access (one project, one impact study, one consultation, one authorization). A mechanism must be set up that requires staff members in provincial, territorial and federal government departments to cooperate and work together to facilitate the development of mine projects in Canada. More emphasis must be placed on the substitution mechanism to reduce overly-long delays for mine projects and avoid confusion in the sometimes contrasting requirements of the

governments of Canada and Québec. In addition, because exploration, extraction, and the conservation and management of non-renewable resources are under provincial and territorial jurisdiction, the single access point should be at the provincial/territorial level, which is where fine-scale knowledge of the land base is located. The provinces and territories could, of course, ask the federal government experts to intervene on specific points without requiring them to conduct their own environmental assessment process.

In short, the mining industry is asking for a single access point with the proper level of authority to ensure that projects can advance at various government departments. The access point should also be able to provide promoters with guidance on what is needed, to enable them to provide the necessary deliverables and facilitate the progress of their projects.

In addition, if the goal is to accelerate the development of CSM mining projects, the value of the projects must be recognized by the government, which must send a clear message that the development of mining projects is welcome in Canada. The government authorities must signal that these mining projects are in line with Canadian strategy and make the necessary resources available to assist their development. With the foreseeable growth in the number of projects, the government will also have to increase the number of staff available to ensure that analyses are conducted in a timely manner without unnecessarily slowing project development. Project promoters have often complained that they have to explain or present their projects repeatedly as the analysts change during the authorization process. It is imperative that the government put measures in place to ensure continuity and fluidity in the process when the analyst changes. The government must become a genuine partner for mining development and reduce red tape. It must provide more support for promoters by highlighting the advantages that result from the responsible development of natural resources, to prevent this “burden” from being placed on companies, by encouraging the development of new projects, and by doing more to explain their importance for Canada’s prosperity in terms of ongoing public services and quality of life as well as the importance of metals and minerals in our lives. This will inevitably help improve the social acceptability of mining projects.

Promoters currently have no guarantee that, if they do things properly and submit to and comply with all the rules, they will obtain all the authorizations needed to go ahead with their projects in a timely fashion. Unfortunately, our authorization system does not reward work well done.

Today, the biggest obstacles for mining companies are:

- uncertainty about the environmental authorization processes;
- uncertainty about relations with Indigenous communities;
- uncertainty about the time needed to obtain permits;
- uncertainty about the division of decision-making powers between governments and communities;
- uncertainty about the payment of mining royalties (under provincial and territorial jurisdiction);
- uncertainty about the availability of labour of quality and in sufficient numbers to meet the need for development.

To reduce uncertainty in the environmental authorization processes and uncertainty about relations with Indigenous communities, clear rules could be established to allow promoters to implement their projects.

Although the industry considers that it is essential to achieve social acceptability for mine projects, the process must be clearly defined and known to ensure that projects are not unduly delayed. Here, it is important that community consultation processes do not become referendums or the expression of a right of life or death over the project, but rather a process to make a project more acceptable. The process can be used by promoters to improve their projects after taking into account the concerns of

the local population. Ultimately, it is up to the government to decide whether or not a project is acceptable in its current form and to suggest modifications or adjustments to make it acceptable if required.

3.4 Build Sustainable Infrastructure

What regional infrastructure gaps must be addressed (e.g., transportation and clean energy) to enable the sustainable development of Canada's critical mineral resources?

The future of the Canadian mining industry increasingly depends on Canada's remote and northern regions. However, the lack of infrastructure in these regions creates a major obstacle for new discoveries of mineral deposits and their development. The problem is made worse by the fact that these areas are not generally eligible for federal infrastructure programs because of the public use criterion and the per-person funding formula.

The remote and northern regions are characterized by the isolation of their communities, extreme temperatures and the almost total absence of infrastructures and dwellings over hundreds of kilometres. They have one of the country's highest costs of living. Similarly, research conducted by the mining industry has shown that it is up to six times more expensive to perform exploration activities, and between 2 and 2.5 times more expensive to construct new mines, in northern regions compared to more southerly regions.

If the government wishes to see more economic development in Canada's remote regions, its support must be commensurate with the industrial policies it puts in place.

Remote communities are currently reviewing the issues they face in terms of goods and passenger transportation. Remoteness and isolation create a number of challenges, in particular concerning access to essential commodities such as perishable foods. The Government of Canada must redouble its efforts to support the development and optimization of transportation infrastructures since without them, the difficulties facing these northern communities will remain and the integrated and sustainable development of the natural resources found there will not be possible; nor will the maximization of benefits it makes available for the whole of Canada.

Without the development of strategic, wealth-creating infrastructures to make investment more competitive, these regions will depend disproportionately on unviable transfer funding for basic services and program delivery, based on standards that are often lower than the standards applied in the more southerly regions of Canada. Since there are few viable economic options other than resource development, and since Indigenous communities are increasingly supportive of activities that lead to the development of infrastructures for wealth creation, the federal government should:

- Define an infrastructure program that takes into account the fact that resource extraction is key to the development of Canada's remote and northern regions; it creates the leverage needed to maximize, over the long term, the social and economic benefits generated by limited investment;
- Support, as far as possible, projects that are advantageous for both communities and industry under all infrastructure programs, in order to maximize economies of scale.

The current ownership model is problematic, since some mining companies pay the full cost to develop highways, which can then be used by other companies. It would be fairer to require other road users to pay for their use. However, if the government does not want to take this approach, it should offer financial support to mining companies for the construction or rebuilding of "multi-user" infrastructures.

To attract participation by companies and also private investment, the government could offer tax credits or matching funds to create a public/private balance. In addition, federal programs should be harmonized with, and even be designed to complement, provincial programs.

Government departments should exchange more information to ensure that roads are developed to match various regional needs. For example, a single road could be developed instead of one road for forestry, one for mining and one for communities. It is also important for mining promoters to know about government intentions and commitments in terms of infrastructure, in order to integrate them with their own plans and long-term vision.

To make Canada competitive on the world stage, the government should introduce measures to ensure that rail and maritime infrastructures meet companies' needs. Minerals should be given priority for railcars and containers in ports to ensure that products and ore can be delivered within a competitive timeframe.

Access to clean energy, especially electricity, will be one of the mining industry issues that will have the most importance for sustainable development in Québec and Canada in the coming years. Like other major economic actors, the mining industry has begun its shift towards the decarbonization of its facilities and equipment. However, knowing that the hydroelectric grids in the Abitibi-Témiscamingue and Côte-Nord regions are already overloaded, the mining industry is worried that the existing energy infrastructures will not be able to support its development during this key transition. The issue is made even more acute when mine facilities are not connected to the grid, for example for mines located north of the 49th parallel (the area covered by Québec's *Plan Nord*) which rely on diesel or liquefied natural gas for energy and generate large quantities of greenhouse gases. These mines have no other option than to use fossil fuels extensively to generate their own electricity and operate mobile equipment.

Other types of clean energy could be developed to help the mining industry reduce the carbon footprint of its products. In some regions, such as the Côte-Nord region in Québec, access to residual forest biomass makes it possible to use bioenergy to produce iron ore pellets. However, these supply chains need to be structured. Support in this area, and also for other clean energies such as green hydrogen, could generate major benefits for the sustainable development of Canada's resources.

3.5 Advance Indigenous Reconciliation

[How can Indigenous governments and organizations, communities, and individuals partner and participate in critical mineral value chains \(including regulatory processes\)?](#)

The mining industry already plays a leading role in ensuring that the Indigenous peoples participate in natural resource development, in particular by signing agreements that have increased wellbeing in Indigenous communities throughout Canada.

The industry supports the efforts made to help Indigenous communities benefit fully from the economic opportunities generated by mineral extraction. It encourages their involvement by providing training, creating businesses and jobs, making social investments and applying local purchasing policies.

The government, in turn, should organize roundtable discussions to develop a dialogue about mineral development upstream from the regulatory process or project approval process, to avoid situations in which communities can only update their knowledge by opposing a new project. It must help Indigenous communities improve their ability to do business, take part in consultations and obtain jobs. The government must also provide more support for promoters to facilitate consultations, in particular with Indigenous communities. Clear guidelines should be laid down and the obligations of each party should be explained in more detail, since currently promoters are often left without any support.

There is a need for more predictability in relations with Indigenous communities to reduce the level of risk for mine projects, in particular for investors.

How can government and non-Indigenous industry proponents support this effort?

To support partnership efforts with the Indigenous peoples, the two levels of government should help communities in several ways, since they do not have the necessary funds to take part in all the consultations and participate in mining projects financially. The governments should, in particular, develop financial tools (loans) to help communities take a stake in projects. For this purpose, they must:

- Make fundamental social investments (health, housing, water supplies, education) to help achieve a positive result in terms of the health and education of the Indigenous peoples;
- Create targeted funds to support expertise development in Indigenous communities, training and entrepreneurship, which will help Indigenous people find employment and take advantage of the commercial development opportunities made possible by the mining industry.

Most of the provinces and territories have established policies or guidelines to direct the process for consulting Indigenous communities. The guidelines vary from one province to another, creating expectations for Indigenous communities, and making the work of project promoters more complex, especially since the communities do not always have the resources needed to respond to requests for consultation.

Mining companies would like to see the government take action to rebuild a climate of trust, reduce uncertainty and set guidelines. Only the two levels of government can improve this situation. They must:

- Remind Indigenous communities of the role and responsibilities of each party to ensure that requests for accommodation are not sent directly to mining companies;
- Enter into one or more agreements with Indigenous communities to share mining royalties without changing the level of royalties paid to the government by mining companies, given that mining tax is under the jurisdiction of the provinces and territories;
- Clarify the territories covered by consultations;
- Support the communities consulted, in particular by setting up liaison committees between the government and the Indigenous communities to address the specific issues of the mining sector;
- Establish a temporary discussion table to better communicate the issues;
- Specify who must pay for each consultation; across Canada, it is often not clear who must pay for a consultation, especially since there are no laws setting out the cases in which the Crown, or the promoter, must pay the costs;
- Meet the deadlines for consultation and decision-making and ensure that no discretionary powers make it possible to extend the deadlines;
- Eliminate the ambiguity of accommodations and the lack of precision in the accommodation measures that have consequences for the rights of businesses and communities; the ambiguity derives from the growing difficulty of establishing a distinction between formal accommodation measures (that result from a consultation) and commercial agreements between companies and communities (that result from mobilization).

The industry firmly believes that stronger cooperation between all the parties (the government, industry and the Indigenous communities) will create a more stable commercial environment that will be more favourable for exploration and mineral development while optimizing the benefits for all parties and increasing Indigenous participation in the metals and minerals sector.

3.6 Grow a Diverse Workforce and Prosperous Communities

[How do we leverage critical minerals investment into more diverse skills training, employment, and regional outcomes, including for local, rural and Indigenous communities?](#)

If the government engages in the positive promotion of the Canadian mining industry and its key role in the worldwide energy transition, it will help the industry interest and attract a new generation of workers.

As a general observation, information on the mining sector should be provided from the start of the curriculum (in elementary school), in particular by focusing on the importance of the mining industry in people's everyday lives. This would raise the industry's legitimacy and make it more attractive to young people. Because mines mainly operate in remote regions, the population in non-mining regions often has little knowledge of the mining industry and its multiple career opportunities, which in turn supports the persistent labour shortage.

A scholarship program for women, Indigenous people and immigrants, specifically targeted at the mining sector, is needed to cover housing and living costs. Programs that lead to qualifications require students to live far from home, and financial issues act as a brake on their willingness to study in mining sector programs.

The Indigenous labour force

With respect to the Indigenous labour force, there is an urgent need to work on a culture of integration and to finance various training programs for the local population to support regional development by generating socio-economic benefits.

According to a survey by the Mining Industry Human Resources Council (MiHR), 82% of participating employers agree or strongly agree that "To meet the hiring needs at your company or site, employing Aboriginal peoples is a priority". In addition, the mining sector is, within the private sector, the sector most likely to hire Indigenous people, who make up 6% of the workforce.

However, many Indigenous people do not have the education and official training needed to work in a mine. For example, it may be difficult for some to obtain a driver's licence or explosives permit. The MiHR survey also states that 83% of Aboriginal workers are in trades and labour occupations, while only 8% are working as supervisors, coordinators or foremen, and a low representation are in senior management roles. Initial and ongoing training is essential if the potential of the Indigenous labour pool is to be tapped. The MiHR highlights the need to establish strategies to build and upgrade skills in Indigenous communities to improve their potential. In this area, the pairing of employees, along with coaching and mentoring, are some of the strategies already implemented by many different mining companies. As the Indigenous Skills and Employment Training Program (ISET) indicates, it is important to target support for skills development based on industry demand, and on the promotion of partnerships with the private sector, the provinces and the territories. The involvement of Indigenous communities and development organizations in Indigenous communities with mining companies generates added value. This type of partnership enhances the integration and retention of Indigenous employees.

It is especially important to ensure that the mining industry can provide for the cultural security of Indigenous workers to increase their retention.

The experience gained by certain mining companies shows that promoting a welcoming, inclusive culture in the workplace makes a substantial contribution to the retention of Indigenous employees. Tools such as *Mining Essentials* and the *Guide sur la sécurisation culturelle des Autochtones en formation minière au Québec* are relevant examples. *Mining Essentials* has existed since 2010, and results from a partnership between MiHR and the Assembly of First Nations (AFN). It is a training to employment program for Indigenous peoples interested in exploring career opportunities in mining, and is the only industry validated national mining training program for Indigenous peoples. Created in collaboration with the AFN, the Inuit Tapiriit Kanatami, the Métis National Council, employers, educators and communities, *Mining Essentials* teaches the essential and work readiness skills which have been validated and deemed necessary by industry to gain employment in the mining sector.

Through industry partnerships, *Mining Essentials* provides participants with the opportunity for hands-on learning experiences at a mine or exploration site, consequently enriching their learning experience. What makes *Mining Essentials* unique from other work-readiness programs is that the skills are taught using workplace examples in conjunction with traditional Indigenous teaching methods and mediums. This approach enables learners to better relate to the material by using relevant cultural context and methods.

Strategies are needed in the workplace to increase the employability and retention of Indigenous workers, and it would be useful to set up a workplace education and training committee. These are some of the training programs and retention measures listed by MiHR:

- Workplace literacy;
- Skills development;
- Adult education;
- Coaching and mentoring;
- Employee twinning;
- Prior skills assessment;
- Cultural accommodations;
- Regional cuisine;
- Cultural activities in the workplace.

Various studies, including *Lessons Learned: A Report on HR Components of Aboriginal Community and Mining Company Partnership Agreements*,¹ have shown that the culture and climate in the workplace do not always support diversity, which is why measures to promote a welcoming and inclusive culture in the workplace increases the retention of Indigenous workers. Although less important in the case of non-fly-in mines, the study listed a number of possible accommodations:

- Traditional ceremonies (Aboriginal Day, the solstices, etc.);
- Promoting Aboriginal artists on-site;
- Hosting elder tours;
- Providing an Aboriginal gathering area;
- Providing for periodic on-site pow wows, dancing and similar events;
- Using Aboriginal designs in the buildings;
- Using Aboriginal signage throughout the mine.

It also appears that the physical proximity of an educational institution is a determining factor in a person's decision to pursue education. Being able to stay in the community, near family and friends, makes a positive contribution to educational persistence.²

¹ https://www.mihr.ca/pdf/publications/Lesleconsdelexperience_Final_FR_12Nov2012.pdf

² Assemblée nationale du Québec, 2007. *La réussite scolaire des Autochtones_Mandat d'initiative_Rapport et recommandations*, 68 p.

When a student must move to another city to continue with his or her education, the ability to go back home during long weekends and reading breaks increases motivation.³ A culturally-secure educational environment, which recalls the home community through the proximity of nature, is also a factor for success, although to a lesser extent. A secure environment can also have personal and cultural benefits: being part of an Indigenous cohort from the same community or nation contributes to educational perseverance and success.⁴

Support from family, support from the community, and the adaptation of the education system to meet Indigenous needs are the three main factors for success. Financial assistance and mastery of the language of instruction complete the picture.

The lack of vocational and technical programs for young Indigenous people in most secondary schools is a barrier to their perseverance in the education system.

Female workers

Between 2014 and 2017, the Conseil d'intervention pour l'accès des femmes au travail (CIAFT), schools, employers, sectoral organizations, professional associations, training centres and local communities, including Indigenous communities, all came together to support the increased presence of women in production trades and positions. The objective was to produce an action plan for the mining sector and the Abitibi-Témiscamingue and James Bay-Eeyou Istchee regions to increase the number of women in traditionally male trades in the mining sector.

The action plan led to local and national actions that promoted the emergence and strengthening of sustainable initiatives within the industry. Together, the industry players identified their priorities for action and shared innovative approaches that have created promising opportunities in trades for women who hope to work in the mining sector in the coming years.

The CIAFT also coordinated a partnership with the Comité sectoriel de main-d'œuvre de l'industrie minière (CSMO mines), the Québec Mining Association (QMA), the Institut national de mines du Québec (INMQ), the Comité condition féminine Baie-James (CCFBJ) and mining companies, which made a commitment to take concrete actions and produced an overview of women working in trades in the mining sector along with a sectoral action plan for the industry.⁵

The project led to the creation of a guide to good practice in the integration of female workers, the *Guide des bonnes pratiques de l'industrie minière pour favoriser l'intégration des travailleuses*. The guide demonstrated all the methods used to integrate women by several Québec mining companies, which improved the integration and retention of female workers. The guide is freely available and includes user-friendly tools.

The mining industry has also done its part to enhance the integration of women workers, by establishing assistance programs and providing adapted tools and clothing. The government must help promote the mining industry for female workers, for example by implementing activities to promote and raise women's awareness about mining training programs and trades. Incentives in the form of scholarships would also be beneficial. Some women would like to leave an unsatisfactory job to study in the mining sector, but are prevented from doing so by their financial situation. They have no income during their studies, and must find housing and food in regions where the price of basic goods may be higher.

³ Loiselle, M., 2010. Une analyse des déterminants de persévérance et de réussite des étudiants autochtones à l'Université du Québec en Abitibi-Témiscamingue, 108 p.

⁴ Loiselle, M., 2010. Une analyse des déterminants de persévérance et de réussite des étudiants autochtones à l'Université du Québec en Abitibi-Témiscamingue, 108 p.

⁵ https://ciaft.files.wordpress.com/2017/01/ciaft_femmesmetierssecteurminierqc_pdf.pdf

In the mining industry, few women are present in non-traditional jobs such as production trades and positions (4%) and supervisory and management roles (6%). Because of the worker shortage and the underrepresentation of women in many sectors, they comprise a potential labour pool that should be developed.

Ensuring the employability of female workers will require major upstream work. Women, on average, represent only 5% of graduates from the main programs that lead to mining sector jobs in Québec, in particular because they prefer to continue with their post-secondary education. It is important to encourage more diverse career choices for women in order to increase the number of female students in vocational education. In addition, it would be useful to promote access by female graduates to entry-level jobs in the mining industry, and to improve the retention of female workers by changing practices within the industry to make them more inclusive.

Immigrant workers

There are several obstacles to the integration of immigrant workers. It is hard for them to have their skills recognized, they find it hard to integrate into the workplace culture, they have difficulty finding a job for their spouse, and they worry about settling in a single-industry region, especially if the industry itself is cyclical. In addition, immigrants are unevenly distributed across Canada, and not all regions can benefit from this pool of workers.

It is important to support local and regional development authorities in their search to attract workers to outlying regions. Often, the international experience of immigrants is not fully recognized making it easier to recognize their skills and qualifications would be a good step. Since the feeling of isolation in a rural setting and the difficulty of finding a job for a spouse are among the problems raised, the fly-in fly-out approach could be more widely used to take advantage of the immigrant worker pool located in large cities. Urban areas offer immigrants and their families access to important support services, including a cultural community, language and skills upgrading programs, integration services, and job opportunities for spouses.

For immigrant workers who are willing to settle in outlying regions to work in the mining industry, ways must be found to help them make the transition if they have been laid off from another job or are experiencing another form of insecurity, in order to reassure them about moving to a sector of activity that is known to be cyclical.

International recruitment programs to prepare new immigrants to settle in a specific region would also make it easier to hire and retain immigrant workers in the mining sector. By hiring a group of workers from the same country, and creating reception committees and resource centres at the local level, hiring could be enhanced and more immigrants would be more likely to settle in mining regions.

It is essential to encourage companies to recognize the qualifications of workers from abroad.

3.7 Strengthen Global Leadership and Security

[How might the Government work with its partners and stakeholders so that greater value is placed on high ESG standards throughout the value chain?](#)

Given the current focus on responsible sourcing, the government must promote Canada's advantages and approaches to strengthen its position with respect to multinational corporations looking for "clean" CSMs. Since Canada is a high-cost jurisdiction, it is possible that, for now, other locations such as China can offer critical and strategic minerals at a lower price. However, Chinese methods, in particular for the processing of lithium, rare earth elements and other CSMs, cannot be seen as examples of sound environmental and social practice, and this makes the end product less attractive from a responsible sourcing standpoint. Canada is an attractive alternative for companies that want

their actions to match their words. As a result, the government should use all available platforms to act as an ambassador for Canada's CSM industry on the international stage. The opportunities for development and economic diversification are real, and Canada must seize the opportunity.

The Canadian government already recognizes and promotes best industry practices, including the ESG standard *Towards Sustainable Mining* (TSM) initiative of the Mining Association of Canada. The TSM initiative has been adopted by the Québec Mining Association and nine other mining associations around the world, including several key industry players such as Brazil and Australia. As the program is extended to new areas, it will not only improve practices in Canada but also worldwide. This voluntary initiative by the Canadian mining industry is clearly a key asset that positions Canada as a leader in the field of sustainable mining for companies that follow responsible sourcing policies. Since Canada has taken the lead and established tools such as the TSM initiative, the government must do more to present them to such companies and take advantage of all possible tribunes. The Canadian government must also intervene with other governments to have the TSM initiative recognized as an ESG standard in the mining sector.

In addition, it goes without saying that the government should also help the industry have the TSM initiative recognized by major financial institutions and major international financing funds.

4. CONCLUSION

The Québec Mining Association welcomes the open-minded approach to consultation taken by the representatives of Natural Resources Canada. The adoption of a Canadian strategy for the development of critical minerals would send a clear message that the Canadian government is positioning its mining sector as a genuine solution to climate issues and a potent source of enrichment for Canada. The positive benefits of CSM development will add to the benefits that Canada already derives from more traditional sectors and will generate even more value from mineral resource development. This will inevitably make it easier to attract investors and maintain a strong mining sector in Canada

Critical and strategic minerals will play an increasingly prominent role in the planet-wide energy shift. Canada has everything needed to become a major player. To achieve this goal, the government must create an environment that is conducive to investment and the development of the CSM sector, through an action plan that will structure the sector and involve all levels of government, promoters and communities.

The strategy that will be drafted following this consultation must imperatively take into account the strategies for CSM development that already exist in the provinces and territories, to promote complementarity and effectiveness. It should also consider the present and future energy challenges facing the mining industry. The path to carbon neutrality in the mining sector is blocked by a dependency on fossil fuels and the lack of access to green energy sources such as hydroelectricity.

We are confident that, if measures and processes are harmonized with those of the provinces, exploration, extraction and the creation of Canadian value chains for CSMs will improve Canada's position on the world stage. To achieve this, uncertainty must be reduced as much as possible, more support must be provided for project promoters and communities, an attractive legislative, regulatory, standards and tax framework must be designed, the mining industry must be promoted more effectively, and relations with Indigenous communities must be facilitated.

The QMA hopes that its comments will contribute to the drafting of a strategy that will structure the approach taken by Canada, its mining industry and all Canadians. It remains available to provide further information and offers its support for any future work.