ACTION PLAN 2021

NOTE TO READERS

The Canadian Minerals and Metals Plan (CMMP) respects the roles, responsibilities and priorities of Canada's federal, provincial and territorial governments. As part of this Plan, individual jurisdictions will undertake efforts that best suit their priorities, unique situations and needs. Specific actions can be part of jurisdictions' respective strategies; collaborations with other jurisdictions, partners, or stakeholders; or pan-Canadian initiatives.

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#YourCMMP
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TABLE OF CONTENTS

FROM SLOWDOWN TO GROWTH

Since the release of the Update to Action Plan 2020 in October of that year, Provinces and territories began carefully re-opening their respective economies. While the world grappled with the effects of the Omicron variant that emerged at the end of 2021, there was increased focus on economic recovery and growth.

Nonetheless, the Canadian minerals and metals industry continued to feel the impacts of the pandemic. Mines had to adopt and absorb the costs of stringent health and safety measures to protect workers and surrounding communities, while maintaining viable levels of operation. There was a major reduction in the number of exploration projects, and the overall sector was impacted by market weakness and volatility and supply chain challenges.

That said, Canada's mining industry withstood the shocks as well as or better than many industries. By April 2020, governments in Canada had deemed mining an essential service and provided clear guidance on re-opening, which mitigated disruptions at mine sites.The sector also demonstrated resiliency and adaptability, with some companies producing medical supplies and investing in research to fight the pandemic.

There are examples of partnerships between Indigenous governments, Indigenous communities and industry being strengthened over the past year. Mining companies relied upon on-the-ground information from communities, and permissions were sought to enter lands in a manner that was safe for local populations. Indigenous groups also took steps to play a larger role in the industry in areas like equity investment, procurement and infrastructure development.[1]

By spring 2021, investor confidence and optimism over global economic recovery helped drive up prices for minerals and metals (with price volatility reflecting concerns over inflation). This has helped create a positive outlook for Canada's minerals and metals industry.

Financing for exploration and mine development is up significantly, and employment in the Canadian mining sector is rebounding, with expected year-over-year increases as more mines return to pre-pandemic levels of production and demand recovers. The mining industry GDP was also up in the first quarter of 2021 and was higher than pre-pandemic levels in 2019.

Despite the global disruptions caused by the pandemic, the transition to a clean economy accelerated. Reports from the International Energy Agency (IEA) showed record growth in 2020, with capacity additions for renewable energy growing by more than 45% over 2019 levels.[2]

The continued rise in the demand for clean energy reaffirmed that mining is key to delivering the inputs for a clean economy and driving growth while ensuring high environmental performance. But challenges also emerged. The resiliency of global supply chains was tested, revealing vulnerabilities in delivering important goods to economies, companies and consumers around the world. Risks were exacerbated by emerging protectionist policies in some countries, as well as by China's market dominance for certain products, such as some critical minerals[3] and metals.

1 fnmpc.ca/projects, First Nations Major Projects Coalition; "First Nations playing greater role in Canadian infrastructure development", *Journal of Commerce,* March 26, 2021; comments by Grand Chief Abel Bosum, Cree Nation Government, at the House of Commons Standing Committee on Natural Resources, March 8, 2021.

2 This includes a 90% rise in global wind capacity, a 23% expansion of new solar photovoltaic installations and 40% global increase in electric vehicles. Source: IEA.

3 Critical minerals are important to economic and national security, and difficult to substitute, and/or face supply risks. There is no global definition of critical minerals. Critical minerals are country-specific and their 'criticality' can change based on supply and demand.

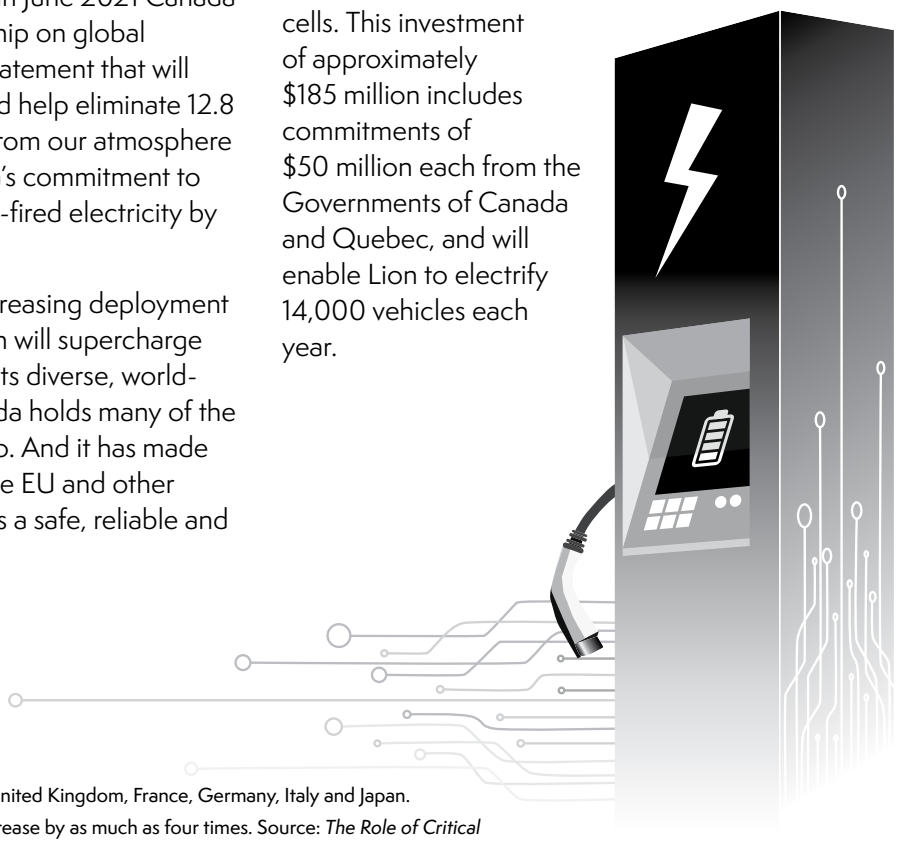
Canada's minerals and metals industry can seize the moment

Global developments also presented opportunities. In June 2021, leaders of the G7 nations[4] and the European Union (EU) committed to ending the pandemic and reinvigorating economies by "building back better." This includes investing through an international partnership to narrow an infrastructure gap for developing nations by 2035—estimated at US$40 trillion. While specific details have yet to be released, a commitment of this scale undertaken by the United States (U.S.), Canada and other allies has great potential for Canada to increase exports of base metals, iron ore and other products needed for infrastructure development.

In April 2021, the Leaders Summit on Climate renewed international efforts to battle climate change. It included pledges from 44 countries, including Canada as well as the EU, which represent 70% of the world's economy and global carbon emissions, to reduce emissions to net zero. Building on this commitment, in June 2021 Canada demonstrated international leadership on global decarbonization through a policy statement that will deter thermal coal development and help eliminate 12.8 million tonnes of carbon pollution from our atmosphere in 2030. This complements Canada's commitment to phase-out unabated, domestic coal-fired electricity by 2030 and focus on clean growth.

Meeting these goals will require increasing deployment of clean energy technologies, which will supercharge demand for critical minerals.[5] With its diverse, world-class geological endowment, Canada holds many of the minerals needed to achieve net zero. And it has made significant progress with the U.S., the EU and other trading partners to be recognized as a safe, reliable and responsible supplier.

Major automakers have also made significant commitments to reduce their carbon footprint. General Motors set 2040 as a target to become carbon neutral, with 40% of its U.S. models offered as battery electric vehicles by the end of 2025. It will invest nearly US$800 million to convert a manufacturing plant in Ingersoll, Ontario, into Canada's first large-scale commercial electric vehicles (EVs) manufacturing plant. Ford Canada is investing $1.8 billion, including a combined investment of $590 million from the governments of Ontario and Canada, to upgrade its assembly plant in Oakville, Ontario, to start making EVs. Stellantis has committed to invest up to $1.5 billion to create its own EV platform in that province. In Quebec, Pallinghurst has invested over US$500 million for two key mining and processing projects that will aim to supply automotive and battery manufacturers, such as Tesla and Volkswagen in 2023. Lion Electric, a producer of heavy-duty electric vehicles, will construct a plant and innovation centre to produce battery modules and assemblies from lithium-ion cells. This investment of approximately $185 million includes commitments of $50 million each from the Governments of Canada and Quebec, and will enable Lion to electrify 14,000 vehicles each year.



4 Members of the G7 are Canada, the U.S, the United Kingdom, France, Germany, Italy and Japan.

5 Demand for critical minerals is expected to increase by as much as four times. Source: *The Role of Critical Minerals in Clean Energy Transitions*, IEA, 2021.

Such commitments can go a long way in helping Canada establish domestic supply chains for critical minerals, batteries and EVs. These supply chains include activities such as exploration, and mining products including nickel, lithium, cobalt, copper and other minerals and metals which Canada produces or has the potential to produce in a sustainable manner. Supply chains also include downstream steps, such as refining and manufacturing, which can generate significant economic activity within Canada—as opposed to shipping raw materials to other countries where value is added.

Canada is well positioned to respond to increasing expectations by consumers and commitments made by trading partners to participate in supply chains that deliver responsibly produced goods.

Demonstrating Canadian Leadership in Climate Action

The changing climate is firmly embedded in global, national and sub-national dialogues. It can create significant and long-lasting impacts on Canada's communities, environment and economy.

For mining, climate change may require additional maintenance and repairs, changes to capital expenditure plans, planning for operational shutdowns and supply chain disruptions due to extreme events (e.g., floods, droughts and wildfires), and changes to the design and management of tailings containment and reclamation. The resiliency of Canada's minerals sector is dependent on taking action to address these impacts.

To understand the impacts and how we are adapting, Natural Resources Canada released *Canada in a Changing Climate: National Issues Report*. This report addresses climate change impacts and adaptation issues of national importance that are best understood through an integrated, pan-Canadian perspective.

For the mining sector, the report identifies the need to integrate climate change impacts into business strategies—ultimately leading to decisions that reduce vulnerability and build climate resiliency.

To raise the bar for industry performance and drive positive change, The Mining Association of Canada (MAC) released the new *Climate Change Protocol* in May 2021. As a new addition to its *Towards Sustainable Mining* (TSM) initiative, this protocol is designed to minimize the mining sector's carbon footprint, while enhancing climate change disclosure and strengthening the sector's ability to adapt to climate change. It requires companies to make commitments, set targets and take action.

This protocol includes three performance indicators to support companies in integrating climate change considerations in their operations in a more holistic manner:

1. Corporate climate change management
2. Facility climate change management
3. Facility performance targets and reporting

To ensure tailored solutions, MAC released a new *Guide to Climate Change Adaptation for the Mining Sector*[6] that provides best practice guidance for the mining industry. This includes assessing potential climate changes at mine sites and the potential impacts of those changes on mine operations and infrastructure, and developing plans to implement appropriate adaptation measures.

6 Funded through Natural Resources Canada's Climate Change Adaptation Program and developed in collaboration with Golder Associates and Lorax Environmental Services.

The CMMP as a framework to guide recovery and growth

Canada's minerals and metals industry managed well through a bruising pandemic, and the outlook for this sector is improving. But new challenges have emerged around inflation, geopolitics and the need to halt the pandemic in countries around the world.

The CMMP—released before the full effects of COVID-19 were realized—was designed to fortify Canada's competitive position and to respond to challenges as they arise. It will continue to serve as a touchstone for the minerals and metals sector as Canada and the world shift toward recovery and growth, which are largely driven by increased demand and the transition to a clean, global economy.

Continued pan-Canadian collaboration, fostered through the CMMP, can help achieve net zero by 2050, rally stakeholders to capture opportunities for made-in-Canada supply chains for critical minerals and batteries, build capacity for processing, and support a more diversified workforce with the skills for a modern, low-footprint industry.

Continued collaboration will also be required to drive success in the CMMP's Strategic Directions: Economic Development and Competitiveness; Advancing the Participation of Indigenous Peoples; the Environment; Science, Technology and Innovation; Communities; and Global Leadership.

This Action Plan remains focused on implementing the CMMP objectives. It provides an update on the pan-Canadian initiatives introduced in Action Plan 2020, areas of collaboration identified in the Update to Action Plan 2020, and highlights the wealth of actions that federal, provincial and territorial (FPT) governments and stakeholders have taken to support Canadian mining. It also introduces an approach to help chart the course forward so that Canada's mineral and metals sector can continue to grow prosperity across all regions of the country.

REALIZING THE VISION

THE VISION*

CANADA IS THE LEADING MINING NATION

Canada is home to a competitive, sustainable and responsible minerals industry that benefits all Canadians. The country is a global leader in mining-related science, technology, social and environmental practices with a clear and predictable regulatory environment, innovative clean technology solutions, and best management practices. It boasts a skilled and diverse workforce, an attractive investment climate, partnerships with Indigenous Peoples, and strong relations with communities.

PRINCIPLES TO STEER THE VISION

- The mineral development sequence provides essential products for the evolving global economy and substantial socio-economic benefits for regions across Canada, including northern, remote and isolated communities, and urban centres.
- Responsible mineral development integrates the concept of sustainability—human, social, economic and environmental.
- Canada's bold vision for the industry is responsive and adaptable to emerging global forces and new frontiers.
- Leading science, engineering and innovation advances the competitiveness of the minerals sector and fosters responsible industry practices.
- A strong national brand and global leadership advances Canadian interests at home and abroad, strengthens the economies of Canada's regions, and promotes Canadian values.
- Respect for jurisdictional authority, effective legislative and regulatory frameworks, community engagement, and partnerships are foundational.

APPROACH TO ACHIEVE THE VISION

The Plan includes six strategic directions:

ECONOMIC DEVELOPMENT AND COMPETITIVENESS: Canada's business and innovation environment for the minerals sector is the world's most competitive and most attractive for investment

ADVANCING THE PARTICIPATION OF INDIGENOUS PEOPLES: Increased economic opportunities for Indigenous Peoples and supporting the process of reconciliation

THE ENVIRONMENT: The protection of Canada's natural environment underpins a responsible, competitive industry. Canada is a leader in building public trust, developing tomorrow's low-footprint mines and managing the legacy of past activities

SCIENCE, TECHNOLOGY AND INNOVATION: A modern and innovative industry supported by world leading science and technology—across all phases of the mineral development cycle

COMMUNITIES: Communities welcome sustainable mineral development activities for the benefits they deliver

GLOBAL LEADERSHIP: A sharpened competitive edge and increased global leadership for Canada

*This vision will be achieved through collaboration between the federal, provincial and territorial governments, Indigenous Peoples, industry, advocacy groups and Canadians.

TAKING STOCK: REALIZING THE VISION

Tracking accomplishments under the CMMP is essential towards realizing its vision. It helps to identify successful elements and potential gaps, and ensure that future actions are implemented effectively and efficiently.

An inventory of the various CMMP targets, joint or collaborative actions, and pan-Canadian initiatives will support the:

- Assessment of progress on implementation
- Development and /or identification of key indicators
- Identification of gaps and challenges

The three components will include:

MINERAL SECTOR SNAPSHOT

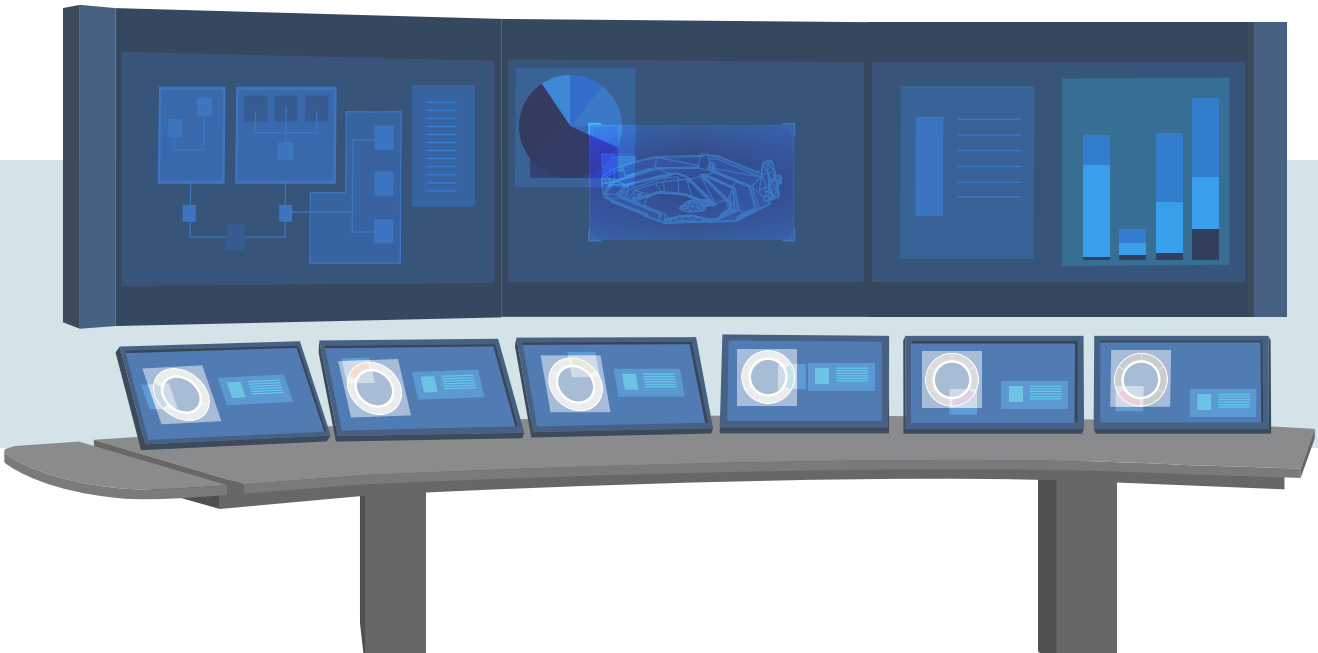
Leveraging the Mining Sector Performance Report to assess the influence of CMMP contributions (e.g., fostering collaboration) in the Canadian minerals and metals sector

IMPLEMENTATION PROGRESS

Tracking progress on CMMP targets and the pan-Canadian initiatives

PROGRESS ON STRATEGIC DIRECTIONS

Providing updates on actions from the FPT governments, industry and other stakeholders using existing public communications



ECONOMIC DEVELOPMENT AND COMPETITIVENESS

PAN-CANADIAN INITIATIVE: A Pan-Canadian Geoscience Strategy

ASSOCIATED TARGET:

BY 2022

A new, pan-Canadian collaborative public geoscience strategy for mineral exploration

WHAT:

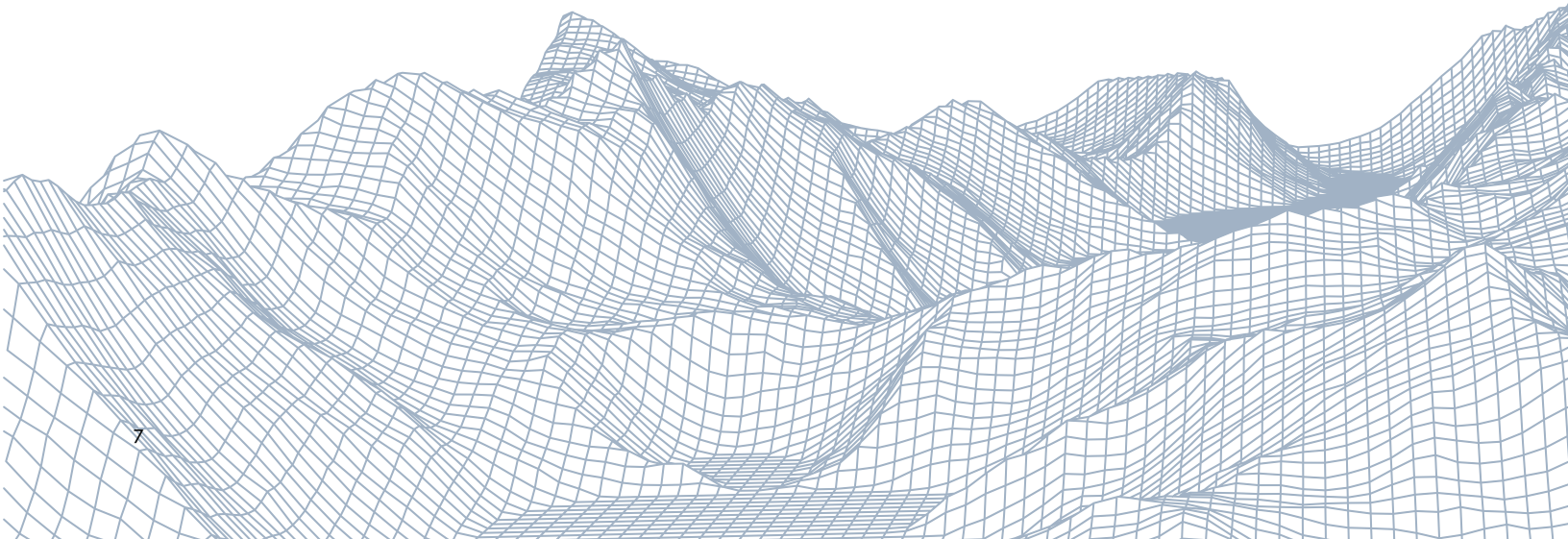
Increased demand for critical and other minerals and metals presents an enormous opportunity for Canada. However, there has been a long and steady decline in many Canadian mineral reserves. It is important for federal, provincial and territorial geological survey organizations (GSOs) to recognize new prospective areas to increase the success rate of private sector mineral exploration.

Public geoscience underpins Canada's competitive advantages in attracting resource exploration and development activities. According to an Ernst and Young study released in 2020, it is estimated that over the past decade GSO-led geoscience programs have generated at least $1.22 billion in economic benefits—7.3 times the amount of money originally spent by government.

Geoscience also provides geological information about public safety and environmental factors that is key to safe and responsible development. This builds public trust and helps to support the delivery of goods and services.

Canada's world leading public geoscience is delivered by GSOs in collaboration with academia and other partners. Action Plan 2020 committed to developing the Pan-Canadian Geoscience Strategy (PGS) in response to technological advancements and the importance of geoscience to Canada's public and economic interests.

Under the National Geological Surveys Committee (NGSC), the PGS has been developed to strengthen Canada's competitive position and reflect trends such as digitalization, data exchange, artificial intelligence, virtual reality and other disruptive technologies that impact the provision of modern geoscience. The delivery of more sophisticated and coordinated information also increases efficiencies and contributes to shared goals, such as supporting exploration for the minerals that are needed for a clean economy.



UPDATE:

Canada's Mines Ministers tasked the NGSC with developing the PGS in September 2019. In response, the NGSC conducted an environmental scan and comparative analysis of geoscience strategies in Canada and around the world and began engaging with Canada's geoscience community. This included reviewing existing records and engaging with stakeholders from the minerals and energy sectors, the geotechnical industry, academia and others.

In September 2020, Canada's Mines Ministers were presented with an interim report on the PGS. They endorsed the proposed vision and mission statements and the "minerals plus" scope to also include the contributions of geoscience to the energy sector and to some societal needs. Ministers directed officials to further engage with geoscientific staff, external stakeholders and Indigenous Peoples.

In response, the NGSC:

- Established regionally balanced working groups to further develop priority areas for action
- Engaged with regional- and national-level stakeholders and Indigenous Peoples for further input on priority areas
- Drafted several iterations of the PGS—taking into account jurisdictional considerations and viewpoints from Indigenous Peoples and stakeholders

During engagement on the priority areas, responses to the PGS were broadly positive. Specific support was expressed for: the NGSC's role as a convenor to situate geoscience in the context of cross-cutting priorities—such as critical minerals; the concept of PGS results being scaled with inputs; and capacity and empowered co-leadership being required for the PGS to succeed in the long term.

The target to complete the PGS was 2022. Given the importance of economic recovery from the COVID-19 pandemic, the NGSC delivered a PGS ahead of schedule. In December 2021, Mines Ministers approved the PGS as an evergreen framework for collaboration on priority areas.

NEXT STEPS:

Further engagement with stakeholders, Indigenous Peoples and organizations to support PGS implementation is under development. Progress on PGS actions will be reported annually.

The NGSC will work to negotiate the renewal of the Intergovernmental Geoscience Accord[7] for signature by Mines Ministers in 2022 (the Accord is renewed every five years).

The NGSC will also use the renewal of the Accord to further facilitate and underscore PGS implementation as a collaborative FPT effort, recognizing the unique roles and mandates of Canada's GSOs.

7 Originally signed in 1996 and set for renewal in 2022, the Minister-level Intergovernmental Geoscience Accord outlines the respective roles and responsibilities of the NGSC, which is comprised of representatives from Canada's federal, provincial and territorial GSOs.

AREA OF COLLABORATION:
Critical Minerals and Batteries

WHAT:

Canada counts significant advantages, which if leveraged, could help it establish end-to-end value chains for critical minerals and batteries. These include a world-class mining industry and deposits of the key ingredients for batteries used in EVs, a strong and growing renewable energy sector that is conducting business in Canada and abroad, leading R&D for battery technology, sophisticated manufacturing capabilities, and unparalleled integration with the U.S. market.

Governments in Canada are implementing policies and making investments in the technology and infrastructure needed to support the uptake of EVs and other clean technologies at all stages of the value chain. Leading auto manufacturers are also retooling Canadian facilities to meet their commitments to offer a wide range of EVs for consumer, commercial and public use.

Update to Action Plan 2020 committed to collaborative work to build all-Canadian critical minerals and battery value chains across sectors and pursue engagement with partners in the U.S. and beyond. This included:

- The development of an evergreen list of critical minerals and key value chains /technologies to: promote Canada's mineral and processing /battery potential to the world; help target government interventions across supply chains; orient and inform private sector and foreign investment; and provide greater certainty to industry and our international allies
- The assessment and analysis of joint policies and tools to position Canada favourably in global value chains
- Taking a coordinated approach to international engagement, investment and business-to-business opportunities

UPDATE:

In 2019, engagement with a broad range of stakeholders took place. A series of workshops culminated in the *From Mines to Mobility: Seizing Opportunities for Canada in the Global Battery Value Chain – What We Heard Report.*

Informed by this work, an FPT Critical Minerals and Battery Value Chains Task Team (FPT Task Team) was formed to advance a pan-Canadian *Mines to Mobility* approach. Members include representatives from four federal departments (Natural Resources Canada, Innovation, Science and Economic Development Canada, the Department of National Defence, and Global Affairs Canada) and from the provinces and territories.

The *Mines to Mobility* approach targets all segments of the critical minerals and battery value chains, including: building mining and mineral processing capacity; advancing battery technology R&D and commercialization; attracting mid-stream battery components "anchor" investors and EV mandates;[8] expanding energy storage; and creating opportunities to increase recycling and innovation capacity.

The FPT Task Team:

- Assessed critical mineral supply-chain opportunities with Hatch Engineering
- Looked at provincial and regional approaches to critical mineral development
- Discussed proposed Government of Canada R&D programming
- Informed FPT international engagement activities
- Discussed Canada's value proposition to prospective investors in Canada's battery value chain
- Informed Canada's Critical Minerals List

This collaboration builds off the respective initiatives that are being pursued across jurisdictions. For example, Quebec launched the Quebec Plan for the Development of Critical and Strategic Minerals strategy and Ontario is developing a critical minerals strategy. In addition, Quebec launched a battery strategy and is pursuing investors to extract and process minerals and build battery components in the province.

Alberta is developing a minerals strategy to further capitalize on its mineral resource potential, including battery minerals, heavy metals and rare earth elements. Alberta companies are exploring the production of lithium from brine and valuable minerals from waste streams, including oils sands tailings.

The Saskatchewan Research Council announced construction of a rare earth elements processing plant, which will improve North America supply chains and contribute to the production of EVs and permanent magnets outside of China.

8 "Corporate mandate" is the business term describing when a multinational corporation that chooses to design, develop and/or manufacture specific products in a particular country, making that country's suppliers part of its global supply chain.

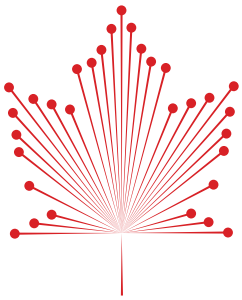
In 2021, the FPT Task Team was consulted by Natural Resources Canada for the development of Canada's List of Critical Minerals. This list is based on domestic economic security needs, the needs of Canada's allies, and our ability to be a sustainable, secure supplier (see sidebar). Members from the FPT Task Team also participated in activities associated with the Canada-U.S. Joint Action Plan on Critical Minerals Collaboration, such as investment seminars to connect companies and mineral processing firms from across Canada with American investors.

The federal budget, released in April 2021, included further commitments that support pan-Canadian efforts to develop value chains for critical minerals and batteries, including:

- $47.7 million over three years in R&D for upstream critical minerals processing, battery precursors and related materials engineered from primary and secondary sources
- $9.6 million over three years to establish a Critical Minerals Centre of Excellence
- $5 billion for a Net Zero Accelerator (NZA)—in addition to $3 billion previously announced for the NZA. The investment will help expedite decarbonization projects with large emitters, scale-up clean technology and accelerate Canada's industrial transformation across all sectors—including a focus on developing a battery innovation ecosystem
- A 50% reduction of the general corporate tax for businesses that manufacture zero-emission technologies

Provinces have also introduced significant financial measures. In Quebec, funding of $90 million was dedicated to the Quebec Plan for the Development of Critical and Strategic Minerals. A supplementary allowance of $22 million over five years was also announced for the calculation of the refundable duties credit for losses, a provision of its mining tax regime.

CANADA'S LIST OF CRITICAL MINERALS



The Government of Canada has developed a list of 31 minerals considered critical. It complements provincial critical and strategic minerals lists that have been released or are in development.

Canada is primed to capitalize on the rising global demand for critical minerals, driven in large part by their role in the transition to a low-carbon and digitized economy. They are essential for renewable energy and clean technology applications (batteries, permanent magnets, solar panels and wind turbines), and needed to achieve net-zero emission targets. They are also required inputs for advanced manufacturing supply chains, including defence and security technologies, consumer electronics, agriculture, medical applications and critical infrastructure.

The federal government engaged the FPT Task Team to help develop and support Canada's list of critical minerals. It also consulted with exploration, mining and manufacturing industries and associations.

Canada has a long history of producing many of these minerals and has the potential to produce more.

NEXT STEPS:

The FPT Task Team will:

- Continue its work to build all-Canadian critical minerals and battery value chains across sectors and pursue engagement with partners in the U.S. and beyond
- Continue to develop a Canadian Critical Minerals Projects Inventory to help map Canada's supply potential and identify investment opportunities for critical mineral projects across Canada. This will help attract battery components and EV manufacturing mandates
- Help inform R&D opportunities and priorities on critical minerals
- Discuss activities and initiatives to shape Canada's engagement with the U.S. under the Joint Action Plan on Critical Minerals Collaboration, the EU under the Strategic Partnership on Raw Materials, and with other like-minded partners including Japan, South Korea and the United Kingdom

ADVANCING THE PARTICIPATION OF INDIGENOUS PEOPLES

PAN-CANADIAN INITIATIVE:
Indigenous Procurement Conferences

ASSOCIATED TARGET:

BY 2021

Increased Indigenous procurement and business activity

WHAT:

Indigenous Peoples have played a large role in Canada's minerals and metals industry for decades. They account for a larger proportion of the mining labour force compared to nearly any other sector. There are more than 450 active agreements in place between companies and communities for activities taking place at all stages of the mining sequence. These typically support training, skills development, funding arrangements and other elements that contribute to socio-economic growth.

There is opportunity for Indigenous Peoples to realize greater, long-term benefits from mineral development and related activities. Procurement is one pathway. Companies with operations in host communities value local businesses that can supply them with goods and services. This shortens supply chains and helps build good will.

Today, more than 600 Indigenous communities are within 100 kilometres of a major minerals and metals project, and over 200 Indigenous businesses supply the extractive industry in Canada. This number can grow.

Action Plan 2020 included a commitment to convene conferences across Canada on Indigenous procurement in mining—in partnership with Indigenous business leaders and organizations, and provinces and territories. These events will help build capacity so that Indigenous communities have resources to develop networks and pursue business opportunities. They will also facilitate mutually beneficial conversations with industry and other stakeholders, and will be tailored to reflect the expertise, priorities and realities of mineral development in each host region.

Following the conferences, a compendium of best practices, success stories and case studies will be published.

UPDATE:

In early 2020, a pilot discussion took place at the AME's Roundup Conference to lay the groundwork for conferences on Indigenous procurement in mining. Shortly after, the COVID-19 pandemic delayed the organization of the procurement conferences.

To keep momentum going, Natural Resources Canada collaborated with the Council for the Development of Native Development Officers (Cando) to develop and deliver free webinars designed for economic development officers, land managers, and leadership in Indigenous communities.

The first four webinars included information on the exploration and mineral development sequence and procurement opportunities in British Columbia, Alberta, Saskatchewan and Manitoba. They also helped identify regional Indigenous businesses and organizations relevant to procurement. Natural Resources Canada will continue to work with Cando on additional webinars for other regions of Canada.

These webinars help set the stage for subsequent events. In October 2021, government officials organized an Indigenous Mining Forum at the New Brunswick Exploration, Mining and Petroleum Conference to support Indigenous participation in the mining sector with an emphasis on procurement and mineral literacy. In November 2021, officials convened an Indigenous Mining Procurement Forum at Québec Mines + Énergie, which featured panelists from industry, government, NGOs, and Indigenous groups to discuss their experiences in procurement and with Indigenous-industry partnerships.

Future events will be organized, including a mining procurement forum at the Cando Annual Conference in Saskatchewan in May 2022.

NEXT STEPS:

FPT officials will design and test conference content and continue to identify partnerships with Indigenous businesses and organizations.

Additional procurement conferences will be planned and webinars will be organized for regions where conferences are not feasible.

An online compendium of best practices will be published following the conferences in 2021 and 2022.

Complementary Action:
Local Procurement Checklist

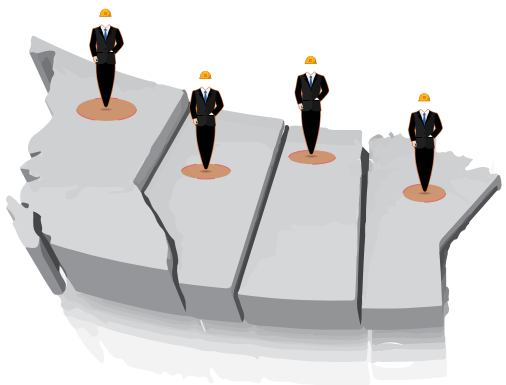
ASSOCIATED TARGET:

BY 2020

A checklist to increase local procurement in the minerals and metals industry is available (under "Communities in the CMMP")

WHAT:

Natural Resources Canada and Mining Shared Value—a non-profit initiative of Engineers Without Borders Canada—are collaborating to develop a pilot checklist for exploration and mining companies and host communities. This will fulfill a commitment made in Action Plan 2020.



Work has been completed for British Columbia, Alberta, Saskatchewan and Manitoba, and it is expected to eventually cover all jurisdictions in Canada.

For industry, it will outline best practices on procuring goods and services from local and Indigenous businesses and include workbooks on tracking company performance in a way that minimizes administrative burden and reflects other Canadian and global standards. A companion document will provide information for local and Indigenous businesses on engaging with companies seeking providers of goods and services.

Jurisdiction-specific directories of organizations that play a role in procurement, as well as a communications protocol for industry to report on their efforts, will also be included.

The checklist will be released in 2022.

THE ENVIRONMENT

PAN-CANADIAN INITIATIVE:
A Re-imagined National Orphaned / Abandoned Mines Initiative

ASSOCIATED TARGET:

BY 2020

An expanded mandate for NOAMI

WHAT:

Canada is highly regarded around the world for its commitment to environmental stewardship and its sustainable approach to natural resource development. However, it counts "legacy" mine sites that were developed at a time when environmental standards were not as high as today. Some of these sites are orphaned and abandoned[9]—posing environmental, health and safety, and economic problems for communities. They can also undermine Canada's reputation as a responsible supplier of minerals and metals.

The National Orphaned / Abandoned Mines Initiative (NOAMI) was established in 2002 through the Energy and Mines Ministers' Conference to address issues related to orphaned and abandoned mine sites in Canada. Since that time, the impacts of climate change are being increasingly felt across all stages of the mineral development cycle. Changes in average temperature, precipitation, sea levels, and occurrence of extreme events may affect the business and environmental performance of the industry.

In 2019, Canada's Mines Ministers directed NOAMI to expand its mandate to reflect new and emerging issues, including climate-related risks and examining mining value from waste as a potential approach to reduce public liability. In response, Action Plan 2020 committed to a re-imagined NOAMI.

9 Orphaned or abandoned mines are those mines for which the owner cannot be found or for which the owner is financially unable or unwilling to carry out clean-up.

UPDATE:

In June 2020, an FPT task team began reconsidering NOAMI's mandate to ensure that it can respond to the most pressing issues related to orphaned and abandoned mines. To inform this work and develop a report for Mines Ministers, the task team hosted a webinar with nearly 80 participants from non-governmental organizations, industry, Indigenous groups, government and academia.

A NOAMI Design Team was later established to reflect the range of stakeholders involved with orphaned and abandoned mines. Representatives from the provinces and territories, Natural Resources Canada, Crown-Indigenous Relations and Northern Affairs Canada, MAC, the Prospectors and Developers Association of Canada (PDAC), and MiningWatch Canada collaborated on recommendations for a refreshed mandate for NOAMI.

In fall 2021, The Design Team proposed a broadened scope to include:

- Climate change and risk assessment (new)
- Local communities and Indigenous Peoples engagement and benefits (new)
- Mine design and closure planning / return of mining lands (updated)
- Innovation (updated)
- Jurisdictional legislative review and financial assurance measures (updated)

Changes to NOAMI's structure are also being considered.

NEXT STEPS:

Ministers/officials will review the proposal and determine next steps for NOAMI.

SCIENCE, TECHNOLOGY AND INNOVATION

PAN-CANADIAN INITIATIVE: Innovation Challenges

ASSOCIATED TARGET:

BY 2022

Incentives to tackle large innovation challenges

BY 2025

Significant gains in the commercialization of mining-related technologies and processes

WHAT:

Innovation plays a critical role in Canada's mining industry and is a key ingredient to reduce costs in a globally competitive industry and improve efficiency and environmental performance. Although Canada has strong mineral exploration and mining supply and services (MSS) sectors, the need to be innovative is a constant. This means new methods, technologies and processes need to be developed to: explore increasingly complex terrains and environments; mine lower grade ore, ultra deep and remote deposits; and minimize footprints around industrial activities and their value chains.

The mining industry faces barriers to realizing its innovation advantages. These include the significant upfront capital investment required, and advancing common research objectives in a fragmented innovation ecosystem. In response to these barriers, Action Plan 2020 introduced the pan-Canadian initiative on innovation challenges. This will leverage the nature of competitive cooperation, inspire creative thinking, focus R&D, and result in meaningful improvements using new and emerging technologies in Canada's minerals and metals sector.

Challenge prizes are widely regarded as an effective catalyst to achieve innovation priorities. They are an opportunity to advance novel solutions to key issues by broadening awareness, driving collaboration, and developing and mobilizing networks and ecosystems to achieve shared goals. Challenge prizes also remain a valuable tool to facilitate commercialization and the adoption of technologies and processes that benefit the sector and Canadians. They also highlight made-in-Canada solutions that can be exported around the world.

UPDATE:

While momentum on the pan-Canadian initiative on innovation challenges was impacted by the COVID-19 pandemic, individual efforts are underway. This includes the Impact Canada Crush It! Challenge, which aims to accelerate technology breakthroughs that can reduce energy use by at least 20% in Canadian mines, as well as British Columbia's Mining Innovation Challenge: *Reducing Water Use*.

NEXT STEPS:

The ongoing development and outcomes of these initiatives will inform future innovation challenge prizes under the CMMP.

An innovation priorities issue brief will be developed.

The FPT Task Team that supports this work will reconvene in late 2021.

CRUSH IT! CHALLENGE UPDATE

The $10 million Crush it! Challenge of Impact Canada was launched in 2018 with the aim to accelerate technology breakthroughs that can reduce energy use in comminution—the process of crushing-and-grinding rock required to liberate valuable minerals—by at least 20% in Canadian mines.

A total of 65 applications were received by January 2019, and a technical review committee—comprised of experts from Natural Resources Canada—evaluated projects based on pre-determined criteria to select the 12 semi-finalists.

On the margins of the annual PDAC Convention in March 2019, these 12 semi-finalists delivered their respective pitches to a Challenge jury, made up of seven experts in mining, mineral processing, innovation and technology integration. The Challenge jury recommended six finalists, who each received $860,000 to develop, test and validate their technology in a 24-month period.

In May 2021, finalists delivered their detailed technical report to Natural Resources Canada, which underwent a two-phase review and evaluation process by the technical review committee and the Challenge jury. A winner is expected to be announced in early 2022.

B.C. MINING ENVIRONMENTAL INNOVATION CHALLENGE: *REDUCING WATER USE*

In December 2021, the Government of British Columbia and the Mining Association of British Columbia (MABC) launched the Mining Innovation Challenge: *Reducing Water Use*. This competition will help address industry-wide challenges related to water use and treatment at mines. The Challenge will benefit the mining industry in British Columbia and Canada by:

- Sourcing scalable innovations to reduce environmental impact and improve environmental, social and governance (ESG) performance
- Identifying technology gaps requiring additional research, development and commercialization
- Encouraging collaboration and risk sharing to source innovation
- Communicating a commitment to innovation that can catalyze investment

MABC engaged Foresight Cleantech Accelerator to help develop and launch the Challenge. Teck Resources, Newcrest Mining Limited, Newmont Goldcorp, PricewaterhouseCoopers (PwC), the University of British Columbia, Global Mining Guideline, and Natural Resources Canada are also participating and contributing.

The Mining Innovation Challenge will run for approximately 12 months. This includes an initial six-week discovery process when industry partners will work with the project team to define problem statements that can be solved through sourcing innovation from British Columbia, Canada and globally.

COMMUNITIES

PAN-CANADIAN INITIATIVE: Improve Mineral Literacy

ASSOCIATED TARGET:

BY 2025

Education-based initiatives to help attract and retain highly qualified personnel and develop a pipeline of future talent

BY 2030

Canada's mining workforce is more diverse and includes 30% women

WHAT:

Mineral literacy is key to Canada's continued success as a global mining power. With the ongoing transition to a clean economy and the accompanying rising demand for minerals and metals, it is important for Canadians to understand the opportunities that sustainable mineral development activities can bring. Community support and readiness is imperative to attract exploration and mining projects, and investment. At the same time, increased mineral development activity means that competition for talent in the mining workforce will be fierce.

Action Plan 2020 introduced a pan-Canadian initiative to improve mineral literacy in Canada. This included building a Pan-Canadian Mineral Literacy Hub (the Hub) as a central point of access with links to existing resources on Canada's mining sector.

The Hub also aims to attract talent for mining-related jobs. This is important as the Mining Industry Human Resources Council (MiHR) estimates that approximately 30,000 to 48,000 workers will need to be hired over the next five years, and employers anticipate that finding skilled workers will be a particular challenge.[10] The Hub will highlight mining as a high-tech industry that offers competitive salaries and promote working in a field that is critical for the transition to a clean economy.

The Hub can also be used by potential investors seeking information on Canada's attractive investment environment and the industry's commitment to ESG principles, as well as innovators, non-governmental organizations, educators, and others looking for up-to-date information on Canada's minerals and metals industry.

10 *Mining Year in Review: National Outlook 2021*, MiHR, March 2021.

Action Plan 2020 included a commitment to develop and deliver a "Canadians of Mining" campaign. Inspired by the "Humans of New York" campaign,[11] it would include portraits and testimonies of individuals who are involved in Canada's mining industry and describe mining's presence in urban and remote communities. The campaign would link the audience to information about career opportunities, educational requirements, and salary and earning potential. Development of the campaign was delayed due to challenges presented by the COVID-19 pandemic.

UPDATE:

The Hub is avaliable on MinesCanada.ca (under "learn about mining"). It brings together resources developed by FPT governments, industry, academia and non-governmental organizations. It currently includes information on:

- The mineral development cycle
- Diverse and exciting careers in the sector
- The role of traditional Indigenous knowledge in the mineral development cycle
- Environmental stewardship
- Academic institutions and programs related to mining

NEXT STEPS:

Work to continue building the Hub will focus on alignment with FPT priorities identified in the CMMP, and it will be continually updated to reflect the latest information for users. This includes building capacity and mineral literacy to support Indigenous communities.

An engagement feature will be added to allow visitors to suggest areas of work for future Action Plans and provide other feedback.

Work to develop the Canadians of Mining campaign is resuming. Once completed it will be featured on the Hub.

11 The Humans of New York is a viral social media campaign developed by Brandon Stanton that pairs portraits of people alongside personal interviews.

GLOBAL LEADERSHIP

PAN-CANADIAN INITIATIVE: Canada Brand for Mining

ASSOCIATED TARGET:

BY 2020

Canada's minerals and metals brand is unveiled

WHAT:

As the world recovers from the economic slowdown resulting from the COVID-19 pandemic, there is a generational opportunity to attract investment in Canada's minerals and metals sector. A confluence of factors—such as demand for critical minerals and the growing importance of ESG in investment decisions—can favour Canada. To grasp this opportunity, a compelling case needs to be articulated to demonstrate the benefits of doing business in Canada and with Canadian companies.

Action Plan 2020 committed to developing and championing a Canada Brand for Mining to bolster Canada's standing as an exploration and mining power, promote the world's most innovative MSS industry, and increase foreign direct investment.

An effective Canada Brand that is representative of the entire sector will promote the benefits of our country's minerals and metals sector in one strong, unified voice. It will build on our success as a model of good governance and transparency, and deliver a clear narrative for domestic and international audiences.

To support companies with their business development efforts, a suite of tools and resources will be available to help leverage the Canada Brand. Also, a Canada Brand for Mining will be used in international programs and initiatives that showcase the Canadian mining industry's competitive advantages.

UPDATE:

In June 2020, an FPT working group began developing elements for a Brand that were articulated on a placemat and accompanying explanatory piece. This work was informed by early engagement with stakeholders at the Mineral Outlook Dialogue in May 2019.

In September 2020, Canada's Mines Ministers endorsed four elements for a Canada Brand:

- Endowment
- Partnerships (alliances and Indigenous engagement)
- Excellence (global authority on innovation and mining sciences)
- Values (sustainable, safe and responsible mining)

Ministers also directed the working group to undertake broader engagement with Indigenous partners and stakeholders.

In December 2020, the federal government tendered a Request for Proposals soliciting branding firms to provide options on governance and stewardship of a Canada Brand, as well as the investments that would be required to fully develop and execute that Brand. The firm 123w was selected to complete the report.

In spring 2021, Natural Resources Canada led federal-level engagement with stakeholders on the placemat. Provinces and territories led engagement in their respective jurisdictions.

A "What We Heard" report was developed that summarizes input from across the country on how to communicate Canadian leadership through a Canada Brand.

NEXT STEPS:

Continue work to develop a preferred governance and stewardship model for the Canada Brand, including multi-stakeholder engagement, as needed.

Work to build out a Canada Brand strategy that includes positioning, creative elements, toolkits and guidance for users.

A draft of the Canada Brand could be presented to Mines Ministers in 2022, with an official launch targeted for 2023.

INITIATIVES BY FPT GOVERNMENTS, ASSOCIATIONS AND OTHER ORGANIZATIONS (October 2020 - August 2021)

ECONOMIC DEVELOPMENT AND COMPETITIVENESS

TAX AND FINANCIAL INCENTIVES

- Renewed funding for Yukon Mineral Exploration Program for grassroots exploration (Y.T.)
- Extra work credits for eligible exploration projects to account for COVID-19 (N.W.T.)
- Changes to the Mining Incentive Program to account for COVID-19 (N.W.T.)
- Introduced the CleanBC industrial electrification rates (B.C.)
- 10% Economic Recovery Rebate on SaskPower bill for 1 year (Sask.)
- 1-year extension of the double-assessment credits program, applicable to exploration work, funds spent on engagement with First Nations and on technical innovation (Man.)
- 1-year extension for mining claims and mineral exploration licences (outside of treaty land entitlement areas) (Man.)
- Mineral Development Fund approved 25 projects (Man.)
- 30% Manitoba Mineral Exploration Tax Credit (Man.)
- Support for residential customers who have overdue amounts on their energy bills due to COVID-19 (Ont.)
- Critical and strategic minerals allowance within Quebec's mining tax regime (Que.)
- Eliminated water use licence application fees and charges for exploration (N.L.)
- 50% income tax rate reduction for businesses that manufacture zero-emission technologies (Can.)
- Expanded the list of eligible equipment for accelerated capital cost allowance deductions (Can.)

CRITICAL MINERALS

- Released Alberta's Minerals Strategy and Action Plan (Alta.)
- Funding for Saskatchewan Research Council Rare Earth Processing Facility (Sask.)
- Launch of Quebec's Plan for the Development of Critical and Strategic Minerals 2020–2025 (Que.)
- Study on mapping critical and strategic minerals (Que.)
- Create a Critical Battery Minerals Centre of Excellence at Natural Resources Canada (Can.)
- Federal R&D to advance critical battery mineral processing and refining expertise at Natural Resources Canada (Can.)
- Contributing to the development of technologies re: the exploration, development and processing of critical minerals and rare earth elements (Can.)
- Investment from FedDev Ontario in the Automotive Parts Manufacturers' Association for Project Arrow to build the first Canadian-made, zero emission concept vehicle (Can.)

INFRASTRUCTURE

- Establish and contribute to the Alberta Smart Grid Consortium (Alta.)
- Recapitalize the National Trade Corridors Fund (Can.)
- Support feasibility and planning of hydroelectricity and grid interconnection projects in the North (Can.)
- Study on infrastructure needs in Canada's mining sector (Can.)

REGULATIONS

- Reduce red tape related to Saskatchewan Mineral Exploration Tax Credit reporting (Sask.)
- Expenditure reliefs re: *Mineral Tenure Registry Regulations* (Sask.)
- New "single-window" for permitting (Man.)
- Established a multi-year, amendable work permit for mineral exploration (Man.)
- Support development/adoption of tools to help the industry with the permitting process (Can.)

GEOSCIENCE AND EXPLORATION

- Create a Yukon Mineral Exploration Fund (Y.T.)
- Funding for Nunavut Prospectors Program (Nun.)
- Invest in Geothermal Resource Development and the Mineral Strategy, including mapping of targeted public geoscience information (Alta.)
- Develop geotechnical tools for exploring precious metals (Que.)
- One-time funding for geoscience data collection and analysis (N.L.)
- Funding for Junior Exploration Assistance and Prospectors Assistance Programs (N.L.)
- Launch the Pan-Canadian Geoscience Strategy (FPT governments)
- Targeted Geoscience Initiative grants for 11 Cdn researchers on critical and other economically important minerals (Can.)
- Co-developing Geo-Mapping for Energy and Minerals–GeoNorth with Indigenous governance organizations (Can.)
- Amended the *Nunavut Mining Regulations* to implement online tools for mineral claims on Crown lands (Nun., Can.)
- Improving access to minerals and metals data, coupled with advanced analytical and visualization tools (Can.)
- PDAC's annual Mineral Finance report on the business environment for the industry (assoc.)
- AEMQ's coaching program to help obtain the UL EcoLogo Certification for Mineral Exploration (assoc.)

OTHER

- Launch of an industry-led Liaison Committee on Mining and Exploration (Man.)
- Launched the Provincial Rapid Antigen Testing Program to allow organizations to add an additional safety measure in workplaces to help reduce the spread of COVID-19 (Ont.)
- Study on Canadian-owned mining intellectual property (Can.)
- Make FedNor a standalone regional development agency (RDA) to support the economic development of Northern Ontario (Can.)
- Establish a new RDA for British Columbia (Can.)
- Canadian Mineral Industry Federation coordinated input by PDAC and MAC on policy issues for Natural Resources Canada (assoc.)
- Mineral Outlook Dialogue co-hosted by NRCan, MAC and PDAC (Can., assoc.)
- Saskatchewan Mining Association (SMA) Saskatchewan Mining Week activities (assoc.)

ADVANCING THE PARTICIPATION OF INDIGENOUS PEOPLES

RESPECTING RIGHTS

- Negotiation of agreements under Section 7 of the *Declaration on the Rights of Indigenous Peoples Act* and the *Environmental Assessment Act* (B.C.)
- Co-development of an Action Plan with Indigenous partners to implement Bill C-15, *United Nations Declaration on the Rights of Indigenous Peoples Act* (Can.)
- Support the 2021 National Action Plan: Ending Violence Against Indigenous Women, Girls and 2SLGBTQQIA+ people (Can.)

INDIGENOUS WOMEN

- Fulfill the commitments to the Truth and Reconciliation Commission's Calls to Action and to implement *Changing the Story to Upholding Dignity and Justice: Yukon's Missing and Murdered Indigenous Women, Girls and Two-spirit+ People Strategy* (Y.T.)

CAPACITY BUILDING

- Providing support through Alberta Indigenous Opportunities Corporation (Alta.)
- Enabling greater participation of students, Indigenous Peoples, and women in research and supporting training and employment opportunities for Indigenous Peoples through the Polar Continental Shelf Program (Can.)
- Improve access to minerals and metals data and analytical and visualization tools for Indigenous and local communities (Can.)
- In partnership with Cando, opportunities for Indigenous youth to learn about economic development (Can.)
- SMA's educational outreach (Indigenous Career Cards, Indigenized Potash kits, Indigenized Lesson Plans: Mining Inquiry Project with Mining Matters) (assoc.)
- Canadian Executive Services Organization (CESO) virtual training for PARO's Mooka'am Kwe: She Rises BIZCamp on procurement and business development in the resource sector as part of "Enterprising Indigenous Women" program (organization)

ECONOMIC BENEFITS

- Working with Yukon First Nations and stakeholders to develop new mineral legislation (Y.T.)
- Released Mineral Development Strategy Panel Recommendations (Y.T.)
- Through the Strategic Partnerships Initiative, support economic development opportunities through clean energy projects in First Nations, Inuit, and Métis communities (Can.)
- New target of at least 5% of federal contracts awarded to businesses led by Indigenous Peoples and mandatory reporting from 92 federal departments and agencies (Can.)
- A new allocation of resources and funding formula under the Aboriginal Entrepreneurship program, with National Aboriginal Capital Corporations Assoc. and Métis Capital Corps. (Can.)
- Developed a pilot local procurement checklist (Can.)
- Renew the Exploration and Mining Guide for Aboriginal Communities (Can., assoc.)
- An Indigenous government-owned business, Det'on Cho-Nahanni, will lead a mine site for the first time following an agreement with Cheetah Resources to develop the inaugural rare earth project poised to begin in Canada (Indigenous government)

MEANINGFUL ENGAGEMENT

- Ongoing dialogue with First Nations to improve the notification/consultation process on mineral exploration (N.B.)
- Ongoing engagement with Indigenous Peoples re: potential benefits of small modular reactors (SMRs) (Can.)
- MiHR's Indigenous Inclusion Training Standard and online Indigenous Awareness Training (assoc.)
- With Cando, deliver training for Economic Development Officers and build capacity in Indigenous communities (Can.)
- AME's Indigenous Engagement Guidebook and Early Engagement Planning Tool (assoc.)

THE ENVIRONMENT

CIRCULAR ECONOMY

- Supporting a scandium extraction commercial-scale demonstration project (Que.)
- Prepared a strategy for implementing the Mining Value from Waste (MVfW) initiative (Can.)
- Study to examine MVfW: Federal, Provincial and Territorial Regulatory, Legislative and Policy Landscape and Issues (Can.)
- Preliminary Resource Recovery Report Card and Gaps Assessment for Canada to quantify the amount of materials recovered and recycled in Canada (Can.)
- Study on potential approaches to adopting Circular Economy strategies at mine sites (Can.)

CLIMATE CHANGE

- Legislate the Yukon's greenhouse gas reduction target at 45% lower by 2030 (compared to 2010) (Y.K.)
- Develop a Climate Roadmap for 2030 (B.C)
- Support the application of new guidance to undertake climate risk assessments and plan climate change adaptation in all stages of mine life (Can.)
- Undergoing Phase 1: Establish Climate Change Adaption and Mitigation Site Level Constructive Audit Tool with mining companies operating in Newfoundland and Labrador (assoc.)
- MAC's Climate Change Protocol: implementation underway and public reporting to start in 2022 (assoc.)
- Updates to MAC's guidance within the Tailings Management Protocol to improve alignment with the global industry standard (assoc.)
- Updates to MAC's TSM Biodiversity Conservation Protocol to include no net-loss commitment (assoc.)
- Continue implementing MAC's TSM Water Stewardship protocol and begin public reporting in 2021 (assoc.)
- PDAC's GHG Emissions Calculator to help estimate a company's site-level emissions (assoc.)
- AMQ's training program to help members achieve MAC's TSM protocols (assoc.)

ALTERNATIVE AND RENEWABLE ENERGY

- Develop RD&D roadmaps for hydrogen, carbon capture, utilization and storage, and renewable and alternative energy (Alta.)
- Provide a 4-part webinar on SMRs (Alta.)
- Signed the Memorandum of Understanding to develop SMRs (Alta., Ont., N.B., Sask.)
- Invested in Tugliq Energy re: the installation of wind turbines at Glencore's remote Raglan nickel mine and Agnico Eagle's Hope Bay gold mine (Can.)
- Launched Canada's Small Modular Reactor Action Plan (Can.)
- Launched a Canadian Hydrogen in Mining National Advisory Committee and technical working groups and developed a Canadian roadmap (Can.)
- The RDA CanNor supporting trials for mineral sorter technology to concentrate rare earth mineral ore to create a more environmentally friendly approach to processing (Can.)
- Potash companies represented by SMA determining suitability for solar and wind farms (assoc.)
- First Nations Power Authority National SMR Forum with Indigenous Communities (Can., assoc.)

RECLAIMING MINE SITES

- 15-year renewal of the Federal Contaminated Sites Action Plan Program (Can.)
- Assess the climate change implications on reclamation and identify gaps and needs for research (Can.)
- AME's Reclamation Guide for Mineral Exploration (assoc.)

SCIENCE, TECHNOLOGY AND INNOVATION

CANADA'S INNOVATION ECOSYSTEM

- Continue implementing a pilot GreenSTEM program to help fund and support technology company creation and high-tech entrepreneurial development (Alta.)
- Continue implementing the Major Innovation Fund to support post-secondary institution research and innovation programs (Alta.)
- Develop an RD&D roadmap for critical minerals (Alta.)
- Develop a white paper on lithium opportunities within Alberta and Western Canada (Alta.)
- Work with post-secondary institutions and industry to support research commercialization in key sectors (Alta.)
- Establish the Centre for Innovation and Clean Energy in partnership with the Government of B.C., (B.C., Can.)
- Released the B.C. Mining Innovation Roadmap (B.C., assoc.)
- B.C. Centre of Training Excellence in Mining (B.C., assoc.)
- B.C. Mining Innovation Challenge (B.C., Can., assoc.)
- Invest in the Strategic Innovation Fund's Net Zero Accelerator to help decarbonize heavy industry, support clean technologies and accelerate domestic GHG reductions by 2030 (Can.)
- Funding for RDAs to support local economies for long-term growth (Can.)
- Regional Economic Growth through Innovation Program delivered by RDAs across Canada (Can.)
- Study to understand and communicate the carbon competitiveness of Canada's mining sector (Can.)
- Invest in the Centre for Excellence in Mining Innovation's Mining Innovation Commercialization Accelerator Network (Can., assoc.)
- PDAC's Innovation in Mineral Exploration report (assoc.)

NEXT GENERATION GEOSCIENCE

- Investment by the Atlantic Canada Opportunities Agency and mining sector partners in technologies to improve exploration (Can.)
- MISA Group/AEMQ study on new technologies and innovations in exploration drilling and human capital strategies (assoc.)

ADOPTING TECHNOLOGY AND INNOVATIVE PRACTICES

- Support a project to improve battery storage technology (Alta.)
- Develop a critical minerals RD&D roadmap (Alta.)
- Implement the Innovation Employment Grant for small- and medium-sized businesses that invest in R&D (Alta.)
- Support lithium extraction from oilfield brine projects (Alta.)
- Establish a technical working group focused on innovation, productivity and competitiveness for the mining and mineral development industry (N.L.)
- Pilot project on a mechanism to trace battery minerals (Que., Can.)
- Research on critical and strategic minerals under a mining sector sustainable development research partnership program (Que.)
- Research on rare earth elements under a mining research and innovation program (Que.)
- Through the Clean Growth Program and in partnership with Université Laval, support pilot-scale clean technology that reduces the environmental impacts of gold mining (Que., Can.)
- Launch the Mining Energy Benchmarking Platform (Can.)
- Replace and expand critical infrastructure to receive satellite data (Can.)
- Investment for reducing GHG emissions in steelmaking at Algoma Steel and ArcelorMittal Dofasco (Can.)
- Invested in ELYSIS to help create the world's first carbon-free aluminum, with strong local supply chains (Can., assoc.)

NEW FRONTIERS

- Co-hosted a Planetary and Terrestrial Mining Sciences Symposium with Deltion Innovations 2021 (Can.)
- Stakeholder engagement for the Canadian Space Agency's (CSA) "A Framework for Future Space Exploration Activities" (Can.)
- CSA's "Economics of Space Resource Utilization Study" (Can.)
- Contributed to the International Space Exploration Coordination Group's *In-Situ Resource Utilization Gap Assessment Report* (Can.)

COMMUNITIES

HUMAN RESOURCES

- Launch of Alberta 2030: Building Skills for Jobs for post-secondary education to support innovation and commercialization (Alta.)
- Including diversity and inclusion within MAC's TSM (assoc.)
- MiHR's legal educational materials on reducing sexual harassment in the Canadian mining sector (assoc.)
- Support for the Canadian Institute of Mining, Metallurgy and Petroleum to increase awareness of and highlight mining as a career choice for youth (Can.)
- AME's public awareness campaign "Part of Our Future" (assoc.)
- SMA's panel on Diversity and Inclusion in the Mining Supply Chain (assoc.)
- MiHR's Green Jobs Internship Program for youth (assoc.)

COMMUNITY READINESS

- Provide more data on mineral exploration to facilitate decision-making at the community level (Can.)
- PDAC's Wilderness Health and Safety Pocket Field Guide (assoc.)
- PDAC and the AME's annual environment, health and safety survey reports (assoc.)

MINERAL LITERACY

- Deliver a virtual Introduction to Hard Rock Prospecting Course through the Mines Training Society (N.W.T.)
- Create online mining outreach programs for schools and communities through MiningNorth Works! (N.W.T., Nun., assoc.)
- Promote and deliver an Introduction to Prospecting Course in communities (Nun.)
- Create a framework outlining outreach activities to increase gender equity and diversity awareness in the sector (N.L.)
- Create a mining outreach program for schools and communities (N.L.)
- Communication products for MAC's TSM protocols (assoc.)
- MiHR's national career awareness brand and website (www.miningneedsyou.ca) (assoc.)
- MiHR's National Youth Mining Career Awareness Strategy 2021-2026 (Can., assoc.)
- Support for Mining Matters to create and deliver educational resources for students (Can.)
- AME's infographics on the mineral exploration cycle and exploration project permitting (assoc.)
- AMQ's campaign on the importance of minerals and metals (assoc.)
- CESO support for increased Indigenous business procurement in the mining sector in Northern Canada through a feasibility study and toolkit (organization)
- CESO research on the state of corporate social responsibility initiatives of Canadian mining companies with a focus on community development programs (organization)

GLOBAL LEADERSHIP

INCREASING MINERALS TRADE AND INVESTMENT

- Held the B.C. Responsible Minerals and Metals Summit (B.C.)
- Support, develop and promote the Invest Canada North website for exploration and development in Canada's territories (Can. Y.T., N.W.T., Nun.)
- Workshops on Canada's global leadership in mine site safety to stakeholders in Latin America (in partnership MIRARCO) (Can.)
- Implement the Strategic Partnership on Raw Materials between Canada and the European Union (Can.)
- Support potential *Investment Canada Act* reviews with improved project-level data (Can.)
- PDAC and the World Economic Forums' International Mines Ministers Summit (assoc.)

RESPONSIBLE BUSINESS CONDUCT

- Enable the Canadian Ombudsperson for Responsible Enterprise to fulfil its mandate (Can.)
- Develop a 5-year Responsible Business Conduct Strategy to enhance government support for Canadian businesses (Can.)
- Expanded MAC's TSM to national mining associations in 9 countries (Finland, Argentina, Botswana, the Philippines, Spain, Brazil, Norway, Australia, Columbia) (assoc.)
- MAC undertaking Phase 2 of the integrated audit protocol (assoc.)
- Updated MAC's TSM responsible sourcing supplements (assoc.)

SUPPORTING THE SUCCESS OF THE MINING SUPPLY AND SERVICES (MSS) SECTOR

- Work with Statistics Canada to produce a more accurate analysis of Canada's MSS Sector (Can.)
- Investment in the International Business Development Strategy for Clean Technology (Can.)
- Participate in international events (Hydrogen and Mines Virtual Summit, Energy and Mines World Congress) that connect Canadian companies with international buyers (Can.)
- Develop Climate Smart Mining intelligence and a series of factsheets (Can.)
- CanExport Program to provide companies with funding to break into international markets (Can.)
- Educational materials/tools on critical minerals for the Trade Commissioner Service (Can.)
- Created the Canadian Mining Export guide, with a database of Canadian MSS companies (Can.)