

The Canadian Mining Story

SUMMER 2026



Canada's Mining R&D Ecosystem:

**How Collaboration Is
Shaping the Future of
Resource Development**



The Mining Association
of Canada
L'association minière
du Canada

mining.ca

Contents

- 3** [Introduction](#)
- 5** [Canada's Underground Innovation Engine: The Centre for Excellence in Mining Innovation \(CEMI\)](#)
- 8** [The Mining Innovation Commercialization Accelerator \(MICA\): Advancing Canada's Clean, Competitive Mining Economy](#)
- 10** [ReThink Mining](#)
- 12** [Le Groupe MISA: A Strategic Partner for Mining Innovation](#)
- 14** [Corem: A Strategic Ally for Sustainable, High-Performance Mineral Processing](#)
- 16** [CANMET Mining](#)
- 18** [NRCan and The Government of Canada](#)

Introduction

Canada's mining sector is in the midst of one of the most significant transitions in its history. Global expectations around environmental performance, climate, Indigenous partnerships, digital transformation, and supply-chain security are reshaping what it means to explore, extract, process, and reclaim mineral resources.

At the centre of this shift is a remarkably dense research and innovation ecosystem. Unlike many other jurisdictions, Canada's mining R&D landscape is made up of a tightly knit network of public research labs, industry-led consortia, regional innovation hubs, and commercialization platforms that work together across the full value chain—from exploration to mine closure.

This article looks at that ecosystem through the lens of six key organizations:

- CEMI (Centre for Excellence in Mining Innovation)
- Corem (Innovation in mineral processing)
- MISA (Mining Innovation, Rehabilitation and Applied Research Corporation)
- MICA (Mining Innovation Commercialization Accelerator Network)
- CanmetMining (Natural Resources Canada's mining R&D branch)
- RethinkMining (the brand and platform of the Canada Mining Innovation Council, CMIC)

Together, they form much of the backbone of mining research and development in Canada, and increasingly, they are acting as a coordinated innovation platform rather than isolated players.

Why Mining R&D Matters More Than Ever

Mining is capital intensive, highly regulated, and technically complex. The average mine is now deeper, lower grade, more remote, and under more scrutiny than ever before. At the same time, demand for critical minerals—lithium, nickel, copper, cobalt, rare earths—is projected to surge as the world electrifies transportation and energy systems.

Innovation is no longer “nice to have” in this environment; it is the only way to:

- Reduce costs in lower-grade and more complex ore bodies
- Cut greenhouse gas emissions and energy use
- Minimize water use and tailings risk

- Improve safety in deep and remote operations
- Enhance Indigenous and community outcomes
- Accelerate permitting and de-risk projects
- Meet investor and customer expectations on ESG performance

Canada’s mining R&D ecosystem exists to solve these problems in a way that individual companies, universities, or governments would struggle to do on their own. The organizations profiled below cover different segments of the innovation pipeline: from early-stage research to piloting, demonstration, and commercialization.



Canada's Underground Innovation Engine: The Centre for Excellence in Mining Innovation (CEMI)



As Canada advances its critical minerals strategy, attention is turning not only to where new deposits are located, but to how they can be developed safely, efficiently, and with a smaller environmental footprint. The Centre for Excellence in Mining Innovation (CEMI), based in Sudbury, Ontario, is one of the key institutions helping to answer that question. For a public policy audience, CEMI represents an important bridge between national objectives—such as securing critical minerals, reducing emissions, and supporting regional development—and the on-the-ground realities of operating complex underground mines.

CEMI emerged from the Sudbury Basin, one of the world's most established mining regions and a major source of nickel, copper, and platinum group elements. The geology in this region is deep, complex, and high-stress, which has forced operators to innovate for decades. CEMI was created to harness that accumulated experience and, through focused

research and development, convert it into practical solutions for the broader mining sector in Canada and abroad.

At its core, CEMI is an applied innovation centre focused on solving real operational challenges. It works closely with mining companies, equipment manufacturers, technology developers, universities, and governments. Rather than concentrating on academic research alone, CEMI prioritizes projects that can be tested and validated in operating mines. This field-based orientation is particularly important for government partners seeking to see tangible impacts from innovation investments, such as improved safety statistics, lower energy consumption, or higher productivity.

A great deal of CEMI's work addresses the specific demands of underground hard-rock mining, where many of Canada's current and prospective critical minerals deposits are located. As mines go deeper to access new ore, they must contend with higher rock stress, elevated temperatures, and more complex logistics and safety considerations. CEMI engages with operators to identify the most pressing issues in this environment—such as ground stability, ventilation and cooling requirements, orebody characterization,

OUR SERVICES:



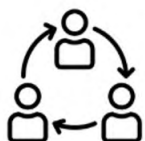
Innovation Scouting

Global search for current and emerging pre-commercial solutions



Challenge Identification

Review of existing challenges from technology road maps and uncovers hidden challenges using a Innovation-GPS (TM) systems analysis process



Challenge Solution Matching

Matches current and emerging pre-commercial solutions with validated industry challenges



Commercialization Services

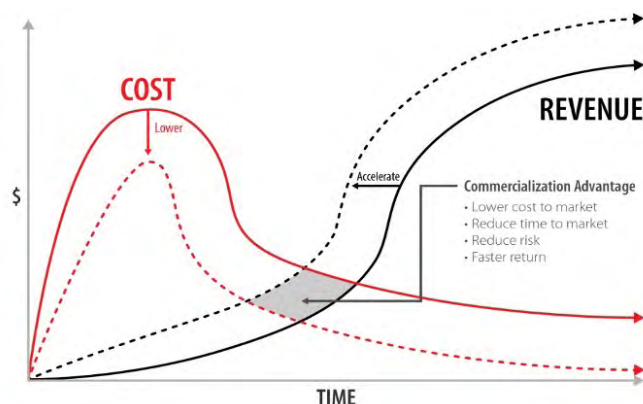
CEMI conducts innovation and commercialization gap analysis assessments and offers services to bridge identified gaps

and the integration of new equipment and digital systems—and then works with research and industry partners to develop and test solutions.

For example, CEMI has supported advances in rock mechanics and mine design that help engineers better understand and manage how rock masses behave at depth. This knowledge is central to keeping workers safe and to reducing unplanned ground falls or seismic events. It has also been involved in projects that seek to improve orebody knowledge, using advanced sensors and data analytics to build a more precise picture of where valuable minerals are located and how they can be extracted most efficiently. Better orebody understanding allows companies to target higher-value zones more accurately, reduce waste, and extract more metal from the same footprint—outcomes that align with both economic and environmental policy goals.

Energy use and emissions are another area where CEMI's work intersects directly with government priorities. Deep underground mining can be energy-intensive, particularly for materials handling, ventilation, and cooling. CEMI works with partners on technologies and methods that reduce that energy burden, whether by optimizing ventilation networks, supporting the adoption of battery-electric and low-emission equipment, or improving mine planning to reduce unnecessary movement of people and materials. These innovations contribute to lower greenhouse gas emissions per tonne of ore mined, supporting industrial decarbonization objectives and enhancing the competitiveness of Canadian operations in a carbon-constrained world.

One of CEMI's most important roles from a policy perspective is its ability to help innovations cross the



“valley of death” between concept and commercial deployment. Early-stage technologies often struggle to secure a first trial at a working mine, and without that real-world validation they can fail to attract investment or industry uptake. CEMI helps identify suitable trial sites, structure demonstration projects, and collect performance data in a way that answers the questions mine managers, regulators, and investors need addressed. In doing so, it de-risks adoption for operators and accelerates the pathway to broader commercialization.

This function is particularly valuable for small and medium-sized Canadian enterprises developing mining technologies. These companies often have high-potential solutions—ranging from automated drilling systems and advanced sensors to AI-driven planning tools and novel rock support systems—but limited access to end-users and capital. By connecting such innovators with operating mines and facilitating structured demonstrations, CEMI strengthens Canada's mining equipment, technology and services (METS) ecosystem. This, in turn, supports government objectives related to innovation,

clean technology development, export growth, and high-skilled employment.

CEMI's work is inherently collaborative. Projects typically involve multiple stakeholders, including industry sponsors, academic researchers, technology firms, and sometimes community or government representatives. For policy makers, this means CEMI can serve as a convening platform where different interests meet around shared technical challenges. It can also provide grounded feedback on the practical implications of regulatory changes or new performance expectations, since its staff and partners work directly with operators implementing new approaches underground.

From a critical minerals standpoint, CEMI's contributions help ensure that Canada is able to develop its resources in a way that is consistent with its broader policy commitments. Improved orebody knowledge and mining methods support more efficient use of existing deposits, reducing pressure to open new areas. Enhanced safety and operational performance help maintain public confidence in mining, which is essential as development moves closer to sensitive environments and communities. Lower energy use and the integration of electrified equipment contribute to national emissions reduction targets. Together, these outcomes support a responsible and competitive critical minerals sector that can supply domestic and allied clean-technology industries.

CEMI also adds to Canada's international standing. Many countries are now seeking to access deeper and more technically challenging ore bodies while raising safety and environmental standards. The expertise and technologies nurtured through CEMI's work—whether in deep mining, digitalization, or low-carbon operations—have global relevance. As Canada engages partners on critical minerals supply chains and clean growth, this gives the country something more to offer than raw materials alone: it offers practical know-how and technologies for responsible mining.

CEMI represents an opportunity to align innovation support with concrete outcomes in critical minerals development, regional economic growth, and climate policy. Long-term collaboration with CEMI can help shape and deliver programs in areas such as underground mine electrification, advanced orebody imaging, safer deep mining methods, and productivity improvements that strengthen fiscal returns. It can also support policy experimentation, for example by piloting new approaches to performance-based regulation in partnership with operators and technology providers.

In short, the Centre for Excellence in Mining Innovation is more than a technical hub in Sudbury. It is a strategic asset in Canada's broader effort to become a secure, low-carbon and trusted supplier of critical minerals, and a partner of choice in the global energy transition.

For more information, please visit <https://www.cemi.ca/>



The Mining Innovation Commercialization Accelerator (MICA): Advancing Canada's Clean, Competitive Mining Economy



The Mining Innovation Commercialization Accelerator (MICA) is a pan-Canadian network designed to help position Canada as a global leader in clean, productive, and responsible mining. Led by the Centre for Excellence in Mining Innovation (CEMI), MICA links innovators, small and medium-sized enterprises (SMEs), mining companies, researchers, and investors in a national effort to accelerate the commercialization of new technologies that respond directly to industry needs and public policy priorities.

For governments focused on economic growth, decarbonization, and supply chain security—particularly around critical minerals—MICA represents an important implementation partner. It helps transform publicly supported research and early-stage innovation into market-ready solutions that can be deployed in operating mines, creating jobs and exports while improving environmental and social outcomes.

A National Platform for Commercialization

MICA's core purpose is to help Canadian SMEs overcome the “valley of death” between prototype and market adoption. Many promising mining

technologies stall at the demonstration stage due to limited access to capital, test facilities, end-users, and commercialization expertise. MICA responds by creating structured pathways into real mine sites, where solutions can be tested, validated, and scaled in partnership with industry.

MICA Projects by the Numbers

70

Funded Projects

4 Calls

67 Active

400+

identified

\$33M+ allocated SIF-Funds

\$200M+ in Private Sector Investment

\$73M+ in follow-on investment

100+ Jobs Created

26 Pilot Projects

14 Commercialized Solutions

71 New IPs Created

**\$45M MICA Program
2021 - 2027**

Through a coordinated national network, MICA connects regional innovation hubs and sector organizations across the country. This approach reduces duplication, leverages existing infrastructure, and ensures that innovations developed in one region can be adopted and scaled nationally and, ultimately, exported internationally. It also provides governments with a single, strategic interface to a wide range of mining innovation and commercialization activity.



Aligning Innovation with Policy Priorities

MICA supports projects across a range of themes that closely align with current federal and provincial priorities for the mining and clean technology sectors. These include higher productivity and efficiency, improved worker health and safety, reduced environmental footprint, electrification and decarbonization of mine operations, digital transformation, and more precise, lower-impact exploration technologies.

By emphasizing real-world deployment, MICA helps ensure that public investments in innovation translate into measurable outcomes: reduced emissions and energy use, safer working conditions, better water and tailings management, and more efficient use of resources. This creates a direct line of sight from research and innovation programs to climate targets, regulatory objectives, and social license to operate.

Economic, Social, and Regional Impact

MICA's activities contribute to high-quality job creation in technology, engineering, and advanced manufacturing, and support the development of domestic supply chains for mining-related equipment and services. This is particularly relevant for regions that are heavily dependent on resource industries and are seeking to diversify their economies while maintaining strong participation in the global mining value chain.

The network's work also supports reconciliation and community development objectives by enabling more sustainable, lower-impact mining practices that benefit Indigenous and local communities. Better environmental performance, improved monitoring, and cleaner technologies help reduce the long-term liabilities associated with mine operations and closure.

A Strategic Partner for Government

For governments, MICA offers a mechanism to align innovation funding, industrial strategy, and climate policy with the practical needs of the mining sector. Programs delivered through or in partnership with MICA can reach a broad cross-section of SMEs and innovators, while ensuring that funded projects are grounded in clear industry demand and have a credible pathway to market.

By focusing on commercialization, collaboration, and national coordination, MICA helps convert Canada's strengths in mining, research, and clean technology into sustained economic and environmental benefits. It provides a practical platform for advancing critical minerals strategies, net-zero commitments, and regional development goals, while reinforcing Canada's reputation as a global leader in responsible mining.

For more information, please visit <https://micanetwork.ca/>

ReThink Mining



ReThink Mining is a national, industry-led innovation platform that brings together mining companies, technology providers, and ecosystem partners to accelerate the development and deployment of new technologies in real operating environments. As a neutral collaboration layer within Canada's mining innovation ecosystem, ReThink Mining focuses on co-developing solutions that address the industry's most pressing challenges across productivity and efficiency, energy use, processing, safety, and environmental performance.

At the core of ReThink Mining's approach is deep, ongoing engagement with industry. The organization is supported by over 25 mining companies and has worked with more than 60 global partners across operators, OEMs, and innovators. This level of participation reflects strong industry commitment, with approximately \$7M in annual direct support and a growing portfolio of over \$75M in collaborative projects. Rather than advancing technologies in isolation, ReThink Mining works directly with its members to identify shared priorities and translate them into structured, multi-stakeholder initiatives.

This model is built on "industry pull" rather than "technology push." Mining companies play an active

role in defining problems, shaping project scope, and participating in validation. This ensures that technologies are developed against real operational constraints and are supported by companies prepared to test and adopt them. Through this approach, ReThink Mining reduces the risk associated with early-stage innovation and creates clearer pathways from concept to implementation.

ReThink Mining operates alongside organizations such as CEMI and MISA, with a complementary role within the broader ecosystem. CEMI plays a critical role in advancing the commercialization of mining technologies, while MISA supports the coordination of innovation funding and ecosystem development. ReThink Mining focuses on mobilizing industry to co-develop and validate technologies in real operating environments across multiple mining companies, helping bridge the gap between early-stage innovation and scalable deployment.

The impact of this model can be seen across a range of active and completed initiatives:

- **Battery Electric Vehicle (BEV) Fleet Demonstration:** A multi-company initiative designed to validate the operational and economic viability of battery-electric equipment in underground mining. By deploying BEVs across multiple operating mine sites, the project aims to de-risk adoption, demonstrate performance under real conditions, and build the business case for broader industry implementation.
- **Mechanical Rock Cutting:** Industry collaboration advancing continuous mining systems as an

alternative to drill-and-blast, improving safety, enabling automation, and reducing energy use.

- Underground Electrification (BluVein): Development and validation of a dynamic charging system to support battery-electric fleets, enabling continuous operation and reducing reliance on diesel equipment.
- ReThink Milling (CAHM / MonoRoll): Advancement of next-generation comminution technologies with the potential to significantly reduce energy consumption and improve processing efficiency.
- Remote Charging Unit (RCU): Development of a system to remove personnel from high-risk areas near the mine face, improving safety while enabling new operating approaches.

These initiatives are not isolated pilots. They are structured as multi-company consortiums that enable shared risk, cross-site validation, and faster learning cycles. Technologies are tested within real mining systems, evaluated for integration and performance,

and supported by multiple operators, increasing confidence in results and accelerating adoption.

This collaborative model is increasingly important as the mining industry works to meet growing demand for critical minerals while reducing its environmental footprint. Innovation in areas such as electrification, energy efficiency, and processing will be essential to achieving both production and sustainability objectives. Canada is well positioned to lead in this space, but continued coordination and support are required to maintain momentum.

ReThink Mining provides a proven platform to align industry demand, technology development, and public funding. By enabling companies to work together on shared challenges, it strengthens the impact of innovation investments and helps ensure that new technologies move beyond demonstration and into scalable deployment across the sector.

For more information, please visit <https://www.rethinkmining.org/>



Le Groupe MISA: A Strategic Partner for Mining Innovation



Le Groupe MISA is a Québec-based innovation network that plays a strategic role in modernizing the mining sector and strengthening the competitiveness of Québec's economy. Established in 1995 and headquartered in the Abitibi-Témiscamingue mining region, MISA brings together mining companies, equipment manufacturers, technology firms, research institutions, and economic development partners around a common objective: accelerating the development, testing, and deployment of innovative solutions in the mining industry.

As a non-profit organization, Le Groupe MISA acts as a bridge between industry needs, technological capabilities, and public policy objectives. Its activities directly support government priorities related to economic development, decarbonization, worker health and safety, responsible resource development, and the growth of Québec's innovation ecosystem.

MISA's work spans the full mining value chain, from exploration through to mine closure and site rehabilitation. It helps identify operational and strategic challenges—such as productivity, digital transformation, environmental performance, and workforce safety—and then matches these needs with Québec-based solution providers and research partners. Through collaborative R&D



and demonstration projects, often carried out on active mine sites, MISA helps de-risk emerging technologies and shorten the time from concept to commercial deployment.

The organization plays a pivotal role in promoting technologies that support automation and digitalization of mines, such as remote operation systems, advanced sensors, data analytics platforms, and integrated monitoring tools. At the same time, it is strongly aligned with environmental and climate objectives, encouraging the electrification of mining equipment, improvements in energy efficiency, and solutions that reduce greenhouse gas emissions and other environmental impacts. This includes innovations in tailings management, water and air quality monitoring, and more effective reclamation practices.

For governments, Le Groupe MISA is a valuable partner in maximizing the impact of public investment in innovation. The organization actively supports proponents in structuring projects, building robust

industry–research consortia, and leveraging provincial and federal funding programs. Because its projects are industry-driven and field-tested, they tend to produce results that are directly applicable and exportable, contributing both to sector competitiveness and to the growth of Québec’s technology and supply sector at home and abroad.

MISA also contributes to knowledge transfer and capacity building. It organizes technical events, workshops, and thematic working groups where stakeholders share best practices, lessons learned, and emerging trends. This circulation of knowledge supports better decision-making in both the private and public sectors and ensures that innovation efforts align with evolving regulatory, environmental, and social expectations.

From a public policy perspective, Le Groupe MISA helps:

- Support high-quality jobs and regional development in mining regions such as Abitibi-Témiscamingue and beyond.
- Enhance the global positioning of Québec as a leader in responsible and innovative mining.

- Facilitate the supply of critical and strategic minerals needed for the energy transition, while improving environmental and social performance.
- Strengthen the innovation capacity of Québec firms and research institutions, encouraging exports and international partnerships.

Governments can engage with Le Groupe MISA as a strategic ally to co-develop programs, identify priority themes for innovation, and ensure that regulatory and funding frameworks effectively support technological deployment in the field. Public officials, economic development agencies, and research funding bodies can draw on MISA’s on-the-ground insight to better target interventions and assess emerging opportunities and risks in the mining innovation landscape.

For further information on its membership, active projects, and collaboration opportunities, visit: <https://legroupemisa.com/?lang=en>

SINCE 2013

90+

OPPORTUNITIES ASSESSED
AND PROJECTS COMPLETED

\$100M

IN BUSINESS VOLUME

230

EXPERTS

315

ORGANIZATIONS INVOLVED
WITH GROUPE MISA

Corem: A Strategic Ally for Sustainable, High-Performance Mineral Processing



As governments around the world look to secure critical mineral supply chains, reduce industrial emissions, and promote sustainable resource development, organizations that can bridge innovation and implementation are increasingly important. Corem—based in Quebec City—is one of those strategic partners.

Corem is a member-based, not-for-profit research and innovation organization dedicated to mineral processing. Its mandate is to help industry develop and deploy cleaner, more efficient technologies across the full processing chain, from ore breakage to tailings and water management. For public authorities seeking to advance both economic and environmental objectives, Corem represents a key lever to accelerate innovation at industrial scale.

What distinguishes Corem is its collaborative model. It provides a neutral, pre-competitive platform where multiple mining companies and technology providers can jointly invest in applied R&D, share risks, and shorten the time between laboratory research and adoption in operating plants. This structure ensures that public investments in innovation can translate more rapidly into measurable gains in productivity, energy efficiency, and environmental performance.



Corem's integrated facilities and multidisciplinary team cover all major stages of mineral processing. In comminution (crushing and grinding), it works to reduce energy consumption—one of the largest energy uses in mining—through improved circuit design, new technologies, and advanced ore characterization. In separation and concentration, Corem develops and optimizes flotation, gravimetric and magnetic processes, and ore sorting to increase metal recovery and improve product quality, which can enhance the value derived from existing deposits and marginal ores.

In extractive metallurgy and hydrometallurgy, Corem helps develop more efficient and cleaner leaching and treatment routes, addressing issues such as impurity management and process intensification. The organization is also known for its expertise in pelletizing and agglomeration, particularly for iron ore, supporting industries that are essential to infrastructure and manufacturing.

Corem also offer its expertise to the entire mining industry to support the valorization of mineral deposits through advanced characterization services, process development and pilot testing. Its activities cover both traditional mineral commodities and critical and strategic materials essential to modern supply chains. For governments, Corem contributes directly to priorities such as decarbonization, resource efficiency, and innovation-led economic development. By providing a credible, independent platform where industry challenges are addressed collectively, it helps reduce technical and financial barriers that can slow the deployment of cleaner technologies. The organization also maintains strong connections with universities and research institutes, supporting talent development and knowledge transfer in fields critical to the future of mining and metals. By supporting mining project promoters in the development, optimization and de-risking of mineral processing flowsheets from laboratory to pilot scale, Corem

**\$10 of concrete and sustainable benefits
per dollar invested by industry members**

contributes directly to the sustainable development of Canada's mining sector, the strengthening of the national economy, and the enhancement of Canada's independence with respect to strategic mineral resources.

Looking ahead, Corem is intensifying its work in areas that align closely with public policy objectives: low-energy comminution, more selective and flexible separation processes, digitalization and advanced process control, and innovative solutions for tailings and water that respond to environmental, social, and governance (ESG) expectations.

In a context where secure access to minerals must be balanced with high environmental standards and public acceptance, Corem offers governments a proven partner: one that can help translate policy ambitions into practical, measurable improvements in how mineral resources are processed and managed.

For more information visit
<https://www.corem.qc.ca/en/>



CANMET Mining



CANMET Mining is a Canadian federal research organization focused on mining and mineral processing. It conducts R&D to improve the safety, efficiency, and environmental performance of mining and mineral processing operations. Its areas of work include:

- Mine ventilation and worker health/safety
- Tailings and waste management
- Environmental impacts and reclamation
- Ore processing and energy efficiency
- Innovation in mining technologies (e.g., automation, sensors)

CANMET Mining supports industry, governments, and communities by providing technical expertise, testing, and applied research related to mining in Canada.

Natural Resources Canada's CANMET Mining has set out a clear and coordinated course for the next five years through its Integrated Business Plan (IBP) 2022–2027. Designed with federal priorities in mind, the plan positions CANMET Mining as a critical science and technology partner in advancing Canada's economic, environmental, and social objectives—particularly in the areas of critical minerals, climate action, and reconciliation.

At its core, the IBP supports a vision of a globally competitive Canadian mining sector that is productive, low-emission, and trusted by Canadians. It recognizes that mining is fundamental to the clean energy transition and to key value chains—such as batteries, renewable power, and advanced manufacturing—while underscoring the need to reduce environmental impacts and strengthen benefits for communities, including Indigenous partners.

Over 2022–2027, CANMET Mining will concentrate its efforts on decarbonizing mining operations, supporting the development of resilient critical mineral supply chains, and driving productivity through innovation and digital technologies. This includes advancing electrification and energy-efficient mining systems; improving the management of tailings, water, and waste; and increasing recovery from complex and low-grade ores. The IBP highlights the importance of turning research into deployable solutions, using CANMET Mining's laboratories, pilot plants, and test facilities to de-risk innovation for industry and inform regulatory and policy development across jurisdictions.

Health, safety, and risk management remain central to the organization's mandate. The plan emphasizes enhanced monitoring of ground stability, ventilation, and occupational exposures, and the development of tools and guidelines that reflect the latest scientific evidence. These efforts support regulatory modernization and help maintain Canada's reputation for high standards in worker protection and operational safety.

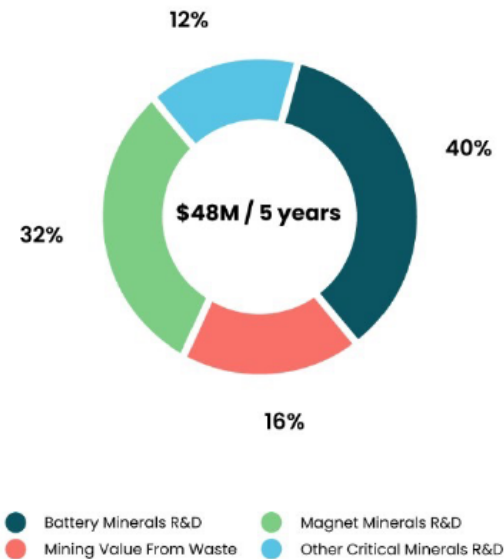
The IBP also responds directly to broader Government of Canada priorities on reconciliation, inclusion, and regional economic development. CANMET Mining commits to working more closely with Indigenous organizations and communities, integrating Indigenous knowledge where appropriate, and supporting approaches that improve community engagement, benefit-sharing, and long-term local development. The plan recognizes that social acceptance and trust are essential for the future of mining in Canada.

A key feature of the Integrated Business Plan is its emphasis on partnerships. CANMET Mining will work collaboratively with provinces and territories, other federal departments, Indigenous governments and organizations, industry, academia, and international partners. This collaborative approach ensures that federal science investments are aligned with Canada's Critical Minerals Strategy, climate commitments, and innovation and skills agendas, while also enhancing policy coherence across the mining file.

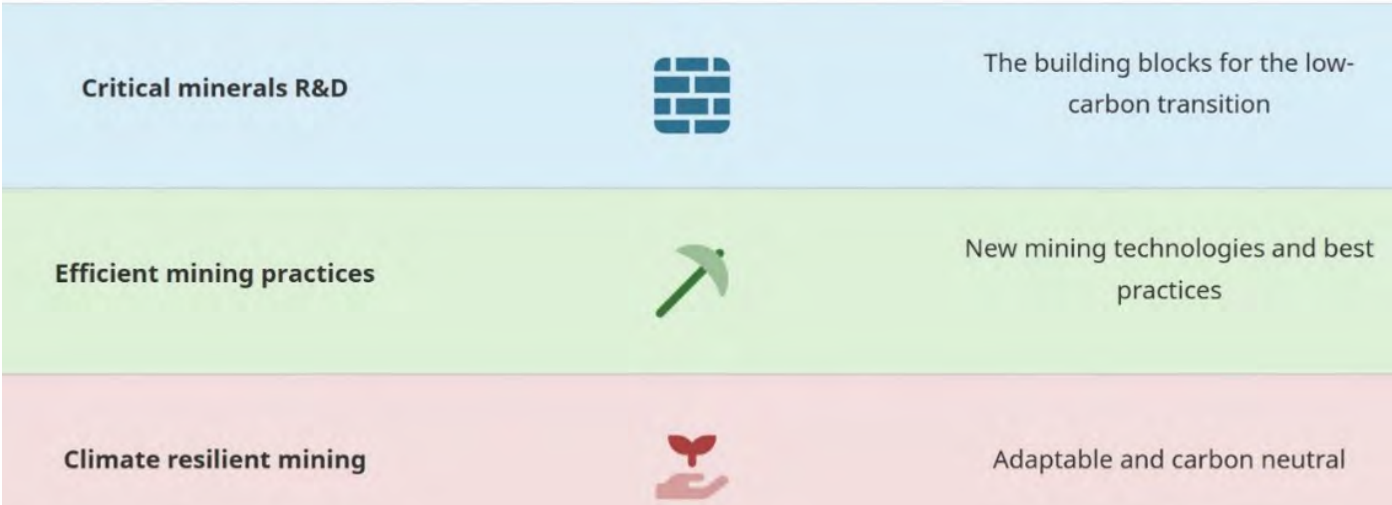
By 2027, CANMET Mining aims to have contributed tangible results: reduced emissions from mining operations, improved environmental performance and reduced liabilities, strengthened domestic and allied critical mineral supply chains, and safer, more efficient mining workplaces. Through the Integrated Business Plan 2022–2027, CANMET Mining is positioning

Critical Minerals Research and Development Priority

- \$48M/5 years
- 4 Fields of Research ↔ 7 Project Areas
- ~60 External Collaborators



federal science and technology as a strategic lever—helping ensure that Canada’s mining sector remains a source of prosperity and high-quality jobs, while supporting the government’s climate, reconciliation, and economic competitiveness goals.



NRCan and The Government of Canada



**Natural Resources
Canada**

Science, technology, and innovation (ST&I) are essential to the competitiveness and sustainability of Canada's mining sector. They support improvements in exploration, productivity, environmental performance, worker safety, and the efficiency of exploration and processing activities. Further, the innovation ecosystem and Canada's R&D leadership position Canada as a global leader in sustainable mining solutions, which supports trade diversification.

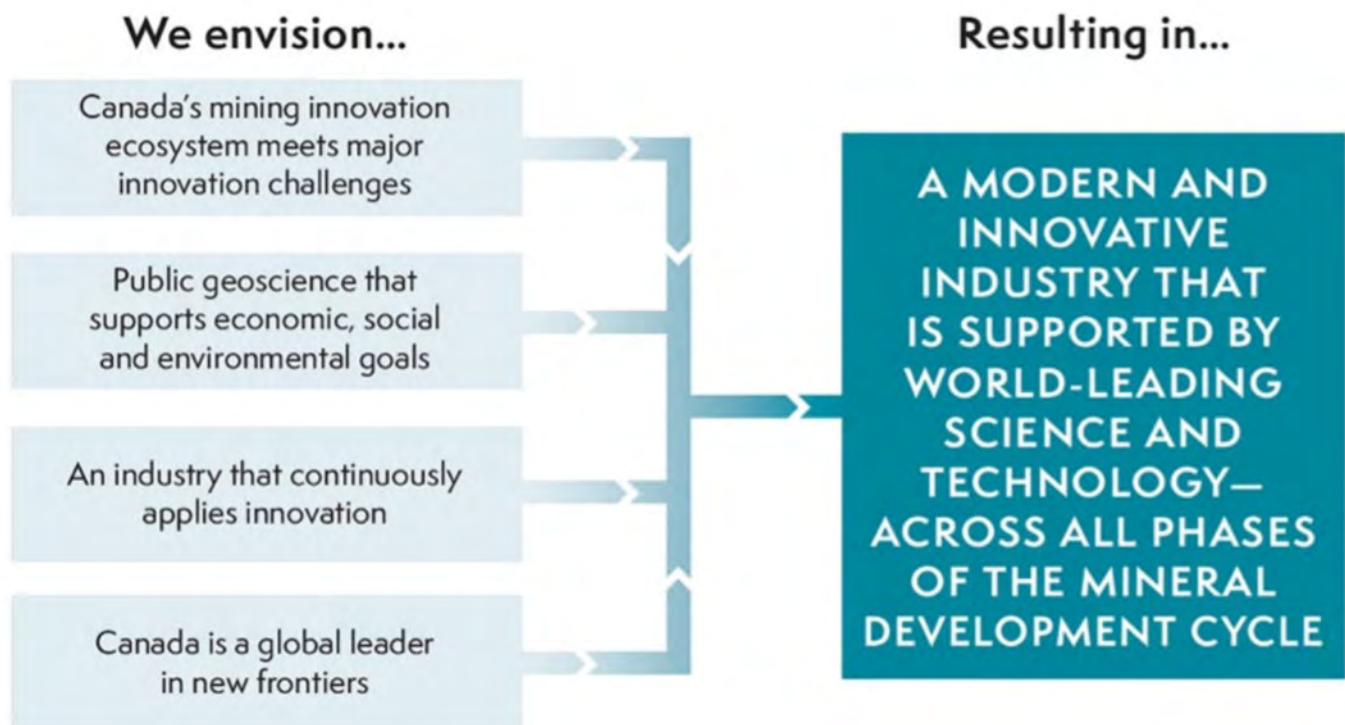
NRCan supports collaboration across the ecosystem through providing science, policy advice, convening activities, and targeted funding programs. For example, the Critical Minerals Research, Development and Demonstration (CMRDD) Program, the Global Partnerships Initiative (GPI), CanmetMINING, and the Geological Survey of Canada play key roles in advancing leading edge research in areas that include geoscience, critical minerals processing, digital and automated mining systems, and environmental performance.

External to NRCan, Innovation, Science and Economic Development Canada (ISED) contributes to mining innovation through programs that emphasize firm-level scale-up, commercialization, and AI-driven technologies, including the Strategic Response Fund (SRF), which has selected critical minerals as a priority industry for investment. The National Research Council (NRC) complements these efforts

by advancing research platforms in areas like advanced materials and digital technologies, though its organization-wide priorities are not specifically targeted to mining or critical minerals.

Outside of the government of Canada, provincial and territorial governments offer programs and services that support science, technology, and innovation in the minerals and metals sector. For example:

- [British Columbia's](#) Mining and Critical Minerals Testbed.
- [Alberta Innovates'](#) Energy Storage and Minerals Supports.
- [Innovation Saskatchewan's](#) Mining and Critical Minerals Innovation Supports.
- [Manitoba's](#) Mineral Development Fund.
- [Ontario's](#) Critical Minerals Innovation Fund.
- [Quebec's](#) suite of programs, including Mining Research and Innovation Support Program, Partnership Research Program on Sustainable Development in the Mining Sector, Research and Development Program for the Extraction, Processing and Recycling of Critical and Strategic Minerals, among others.
- [Nova Scotia's](#) Innovation Grants under the Mineral Resources Development Fund.
- [Newfoundland and Labrador's](#) Research and Innovation Program.



Federal, provincial, and territorial governments collaborate on science, technology, and innovation through working-level partnerships as well as a range of formal forums, such as ministerial tables, deputy-level committees, and working groups that support information sharing, policy coordination, and alignment on shared priorities where appropriate.

Canada's mining innovation ecosystem includes a broad network of partners that work together to advance science, R&D, and accelerate commercialization. Key actors include research institutions such as Mila – Quebec Artificial Intelligence Institute; academic institutions such as the University of British Columbia, McGill University, the University of Toronto, Polytechnique Montréal, Cambrian College, and Laurentian University; innovation organizations such as CEMI-MICA, Groupe MISA, Corem, NORCAT, CIM, and ReThink Mining; major companies such as Teck Resources, Barrick Gold, Agnico Eagle, Cameco, Nutrien, and Vale Canada; and Mining Equipment, Technology, and Services METS companies such as Hatch, Orica Canada Inc., Sandvik Canada, Epiroc Canada. These groups contribute to scientific method innovation in foundational research and modelling, technology validation, SME support, mineral processing expertise,

skills development, and the development of industry guidelines and best practices.

Canada's mining ecosystem has become more established in recent years, but companies continue to face R&D and innovation challenges such as funding constraints, regulatory hurdles, risk aversion, and misaligned strategies to commercial adoption.

NRCan's role in the Canadian mining ecosystem

Convenor / Advancing dialogue and collaboration on challenges and opportunities:

- NRCan plays a convenor role and helps to bring organizations together to advance dialogue, build consensus, and advance collaborative actions on emerging issues, trends, and opportunities to help build a modern and innovative mining industry. This includes:
 - * The Canadian Minerals and Metals Plan has played an important role in defining a common vision and targets for collaborative action (though these need to be updated).

- * The Canadian Critical Minerals Strategy established a concierge service, that helps connect industry and other interested parties with programs, resources, and networks to advance critical minerals projects and value chains and has established several programs that support the advancement of innovations R&D collaboration
- * CanmetMINING and the Geological Survey of Canada conduct leading edge research, have several partnerships to advance collaborative science with international partners, industry, provinces and territories (PTs), and offer funding and other support to advance leading-edge science.
- * Collaborative discussions with PTs to share information and advance collaborative work to address specific topics through multilateral forums such as the Energy and Mines Ministers Conference, Mines Intergovernmental Working Group, and National Geological Surveys Committee, as well as bilateral mechanisms such as the Regional Energy and Resource Tables.
- * The Mineral Outlook Dialogue, an annual event to discuss the current state of the sector and emerging challenges and opportunities, has included discussions on ST&I.
- * Collaborating with key Canadian mining innovation stakeholders through a Team Canada approach to promote Canada's competitive advantage related digitalization, decarbonization, safety and water stewardship innovative technologies to international mining audiences.
- * Promoting the Canadian mining innovation ecosystem in international forums, such as the G7 (through the Critical Minerals Action Plan), the International Energy Agency, and others.

- * CanmetMINING chairs several technical committees for revising and developing new Standards from the Canadian Standards Association to support the use of alternative mobile equipment in the mining industry.

Policy Support:

- NRCan provides policy advice and expertise to address opportunities and challenges to advance innovation in the mining sector and make policy linkages with the minerals and metals sector on issues and opportunities relevant to ST&I at the federal and international level. For example:
 - * NRCan provides policy advice and support to ISED to support funding decisions under the Strategic Response Fund and for the Global Innovation Superclusters.
 - * NRCan provides policy advice and support to CSA related to space resource activities.
 - * NRCan, through the Canadian Minerals and Metals Plan Secretariat, leads research and policy support to identify and address challenges and opportunities relevant to ST&I.
 - * To international partners on means to improve their mining innovation ecosystem through partnership with Canadian innovation leaders and firms (e.g., Indonesia, Argentina, Chile, Peru, South Africa, Brazil, Germany).

Scientific Research:

- NRCan conducts leading-edge research to make Canada's mining industry innovative and sustainable.
 - * [CanmetMINING](#) conducts leading edge research using new technologies and leading-edge practices to



advance extraction and processing of critical minerals, improve the efficiency of mining including in extreme environments, and programs to lessen environmental impacts and adapt to a changing climate, including internal research and research collaboration with industry, academia, and other government laboratories. It also provides specialized services to the industry.

- * The [Geological Survey of Canada](#)'s work includes developing next-generation geological knowledge, leading-edge tools, innovative techniques, and predictive models of Canada's mineral potential for key commodities, including critical minerals. It also assesses geohazard risks (e.g., earthquakes, permafrost degradation) and hydrogeological factors, which can inform infrastructure development and planning.
- * Through the (internal-focused) Digital Accelerator initiative, NRCan scientists are collaborating across the department to leverage AI tools and other digital solutions to enhance efficiency, lower costs, increase productivity, and improve environmental performance in the mining sector.

Funding / Program Support:

- NRCan supports research, development, demonstration and adoption of innovations and technologies through programs and initiatives. For example:

- * [Critical Minerals Research, Development and Demonstration \(CMRDD\)](#) program accelerates the scale-up to commercialization of innovative processing and recycling technologies that fill strategic technology gaps and strengthen sustainable and secure value chains, advancing Canadian mining projects toward production. NRCan has announced over \$141 million for CMRDD contribution funding for twenty-four demonstration projects and three strategic investments.
- * [First and Last Mile Fund](#) (FLMF – subsumes the Critical Minerals Infrastructure Fund): Supports critical minerals development projects, including infrastructure enabling mining and processing (transportation and energy) as well as mine-site development, with a dedicated stream focused on Indigenous engagement, participation, and capacity building relating to critical minerals development projects funded under the program.
- * Energy Innovation Program: supports projects that reduce greenhouse gas emissions through electrification, fuel switching, and integration of clean energy systems, including in the [mining sector](#).
- * [Smart Renewables and Electrification Pathways Program \(SREPs\)](#): Supports grid modernization, energy storage and renewable energy technologies, including in the mining sector.

- * [Global Partnerships Initiative](#): supports, enhances, and promotes Canada's international leadership in critical minerals through joint research, development and demonstration, co-funded critical mineral development projects, capacity building, and transparency and sustainability initiatives. Through the GPI program, NRCan has announced over \$166.6 million in GPI grant and contribution funding to support 27 projects in collaboration with international partners.
- * Critical Minerals Sovereign Fund (forthcoming): intended to make strategic investments—including equity investments, loan guarantees, and supply agreements—in critical minerals value chains once operational.
- * [Indigenous Natural Resource Partnerships Initiative](#): Supports early engagement and capacity building to support Indigenous participation in critical minerals projects.

The LMS Outreach and Engagement Grant can support small engagement projects, including outbound trade and innovation missions worldwide

- Other federal programs include:
 - * [Strategic Response Fund \(SRF\) \(ISED\)](#): Supports three streams of projects: 1) Tariff response, which supports organizations in key sectors highly impacted by tariffs; 2) Innovation, which supports organizations undertaking innovative large-scale projects in priority industries including critical minerals; 3_ AI compute challenge, which supports expanded AI compute capacity, affordability, and/or innovative and sustainable compute solutions.
 - * [Industrial Research Assistance Program \(IRAP\) \(NRC\)](#): Supports small and medium-sized businesses in Canada develop and commercialize technologies, including through collaboration with regional and

national organizations. *Note: NRC IRAP to be integrated into the new Canada Innovation Corporation in 2026-27.

- * [Canada Growth Fund](#): A \$15 billion independent investment fund operating at arm's length from the Government of Canada that invests in projects focused on accelerating efficient emission reduction projects, helping Canadian clean technology companies scale up, and capitalizing on Canada's abundant natural resources and strengthening low-carbon supply chains.
- * [Regional Economic Growth through Innovation \(REGI\) \(ACOA\)](#): Supports business scale-up and productivity and regional innovation ecosystems in the Atlantic region.
- * [Regional Economic Growth through Innovation \(REGI\) \(FedNor\)](#): Supports AI adoption in critical sectors in northern Ontario, including mining, business scale-up and productivity, and non-profit organizations to grow the region's innovation capacity.
- * [Funding for businesses in southern Ontario \(FedDev\)](#): Supports companies in southern Ontario to adopt cutting-edge solutions, enhance productivity, break into new markets and build for the future.
- * [Regional Innovation Ecosystems in the Prairie Provinces \(RIE\) \(PrairiesCan\)](#): Supports projects that respond to specific challenges, opportunity or market demand related to technology commercialization, business scale-up, productivity improvement, ecosystem capacity building, business acceleration and incubation in the prairie provinces.
- * [Regional Innovation Ecosystems in the Pacific Region/British Columbia \(RIE\) \(PacifiCan\)](#): Supports projects that respond to specific challenge, opportunity or market demand related to technology commercialization, business scale-up, productivity improvement, ecosystem capacity building, business acceleration and incubation in British Columbia.

The Canadian Mining Story

Subscribe to the e-newsletter

✉ communications@mining.ca

🌐 mining.ca

Follow us

✉ [@theminingstory](https://twitter.com/theminingstory)

in [Mining Association of Canada](https://www.linkedin.com/company/mining-association-of-canada/)

The Mining Association of Canada

700-141 Laurier Avenue West
Ottawa, ON K1P 5J3

General Inquiries:

T: 613.233.9392 ext. 316

F: 613.233.8897