GREEN MINING INNOVATION

Two Green Mining Innovation Deliverables:

- National Collaboration Strategy Pilot Project

- Assistant to Mining Innovation (Version 2.0)

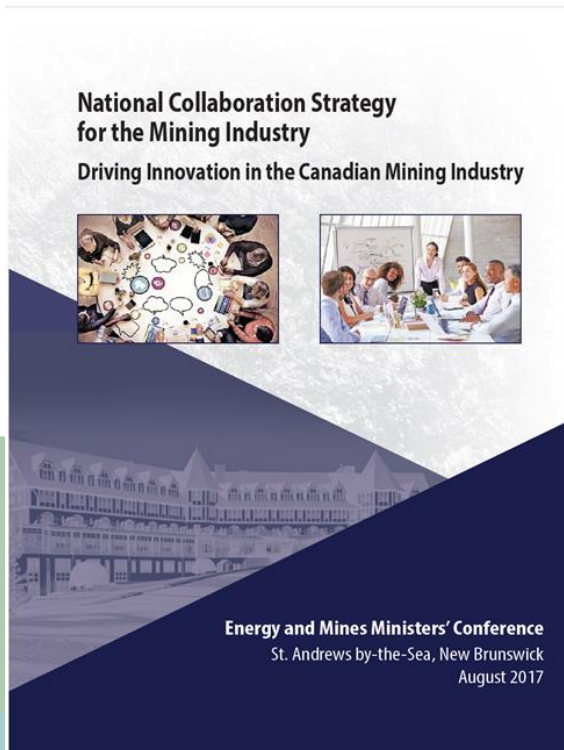# NATIONAL COLLABORATION STRATEGY PILOT PROJECT

NATIONAL COLLABORATION STRATEGY

National Collaboration Strategy for the Mining Industry – endorsed at EMMC 2017

The objective of the National Collaboration Strategy is to improve collaboration to support mining innovation and the adoption of green mining technologies by Canada's mining industry

National Collaboration Strategy for the Mining Industry

Driving Innovation in the Canadian Mining Industry

Energy and Mines Ministers' Conference
St. Andrews by-the-Sea, New Brunswick
August 2017

PREMISE
The Canadian mining sector is currently experiencing an urgent innovation imperative, requiring stakeholders from all areas of the ecosystem to come together and collaborate on new and innovative ideas.

VISION STATEMENT
Recognize Canada as a global leader in the mining industry in terms of both competitiveness and sustainability.

STRATEGIC OBJECTIVES

IMPROVE ORGANIZATION AND COMMUNICATION
Develop a single platform that articulates green mining priorities and supports open communication and collaborations.

OPTIMIZE RESOURCES
Leverage existing resources and funding programs to support the adoption of green mining innovations.

BUILD A CULTURE OF INNOVATION
Address barriers and risks that inhibit collaboration and innovation uptake.

NATIONAL COLLABORATION STRATEGY PILOT PROJECT

Mining Value from Waste

- The task for EMMC 2018 was to test the National Collaboration through a pilot project while addressing an important innovation issue for the mining industry

- Pilot project ("Mining Value from Waste") led by CanmetMINING at Natural Resources Canada, in collaboration with the Green Mining Innovation Intergovernmental Working Group

- Launched with December 2017 workshop involving over 50 participants from governments, indigenous communities, mining companies, mining associations, academia, research centres and consulting companies

- Five provinces currently participate (Alberta, Ontario, Nova Scotia, British Columbia, Newfoundland and Labrador)
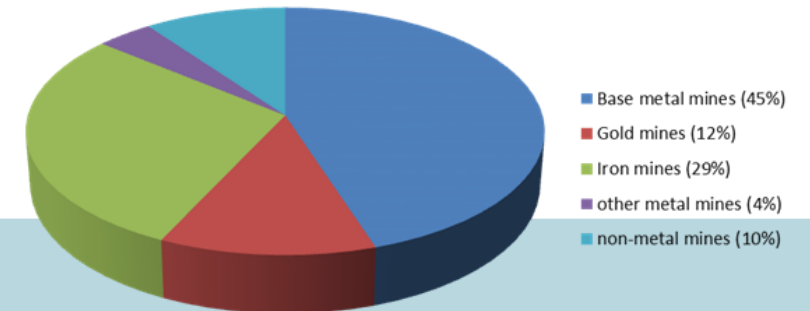
ADDRESSING AN IMPORTANT MINING INNOVATION ISSUE

Project Objectives

The Mining Value from Waste project is a pan-Canadian initiative focused on reducing the environmental, social and economic footprint of mine wastes, particularly tailings, in support of the transition to a low-carbon and circular economy.

Mining Value from Waste will develop and apply processes and technologies (from concept to demonstration) to extract value and reduce liability from tailings, by recovering valuable metals and using the wastes as resources in other applications.

Contributors of Tailings Generation in Canada

- Base metal mines (45%)
- Gold mines (12%)
- Iron mines (29%)
- other metal mines (4%)
- non-metal mines (10%)

Source: Barter, 2011.

TESTING THE NATIONAL COLLABORATION STRATEGY

Areas of Focus

To test and validate the National Collaboration Strategy, the Mining Value from Waste pilot project focused on three main areas:

| 1) Supporting a culture of communication and collaboration | 2) Sharing resources, leveraging existing strengths, tools and organizations | 3) Building a culture of innovation for a clear and measurable target |

Outcomes

✓ Collectively identified project objectives and priority areas of work

✓ Created focused working groups and identified roles and responsibilities to achieve common goals

✓ Developed synergies and optimized resources by leveraging existing strengths and technical skills

✓ Supported a culture of communication and collaboration through in-person meetings and online (e.g. online collaboration community, technical webinars, social media)

✓ Submitted six joint applications to the $155M Clean Growth Program to leverage public innovation funding opportunity

NEXT STEPS

1) Create a Mining Value from Waste research program at CanmetMINING (Natural Resources Canada) that will:

   - continue to test the National Collaboration Strategy
   - continue to build its network, including additional provinces and territories, indigenous and local communities, the investment/financial community, and innovators from other sectors

The program will be initiated through resources at CanmetMINING (4.5 FTE, $650K in salaries, operations and maintenance), expanding and leveraging existing projects and collaborations to grow this pan-Canadian effort.

2) To further operationalize the National Collaboration Strategy, **create a Canadian Mining Science and Engineering Laboratory Network** to respond to the challenges the Strategy identified and drive collaborative innovation in science in the Canadian minerals and metals industry.

The Network will be created through existing resources at CanmetMINING (1.5 FTE, $300K in salaries, operations and maintenance) and leverage resources from participating organizations.

ASSISTANT TO MINING INNOVATION (VERSION 2.0)

ASSISTANT TO MINING INNOVATION – VERSION 2.0

Context

- The Assistant to Mining Innovation is an online platform to:

  - Connect mining innovators and help them to identify potential research synergies and opportunities for collaboration;

  - Avoid duplication of R&D efforts; and

  - Enhance opportunities for the development, deployment, and commercialization of green mining technologies and processes.

- First version endorsed at EMMC 2017

ami Assistant to Mining Innovation | A tool for collaborative innovation in the mining industry

ASSISTANT TO MINING INNOVATION VERSION 2.0

Upgrades to the Assistant to Mining Innovation

To improve information-sharing within the mining innovation ecosystem, the Assistant to Mining Innovation online platform was upgraded this year to include:

- Key mining innovation projects and initiatives currently underway in Canada, including links to main project partners
- New landing page with government and industry news – all mining innovation organizations welcome to contribute
- Improved functionalities such as enhanced search and filter tool

Next Step: Further populate the Assistant to Mining Innovation to broaden the range of projects included
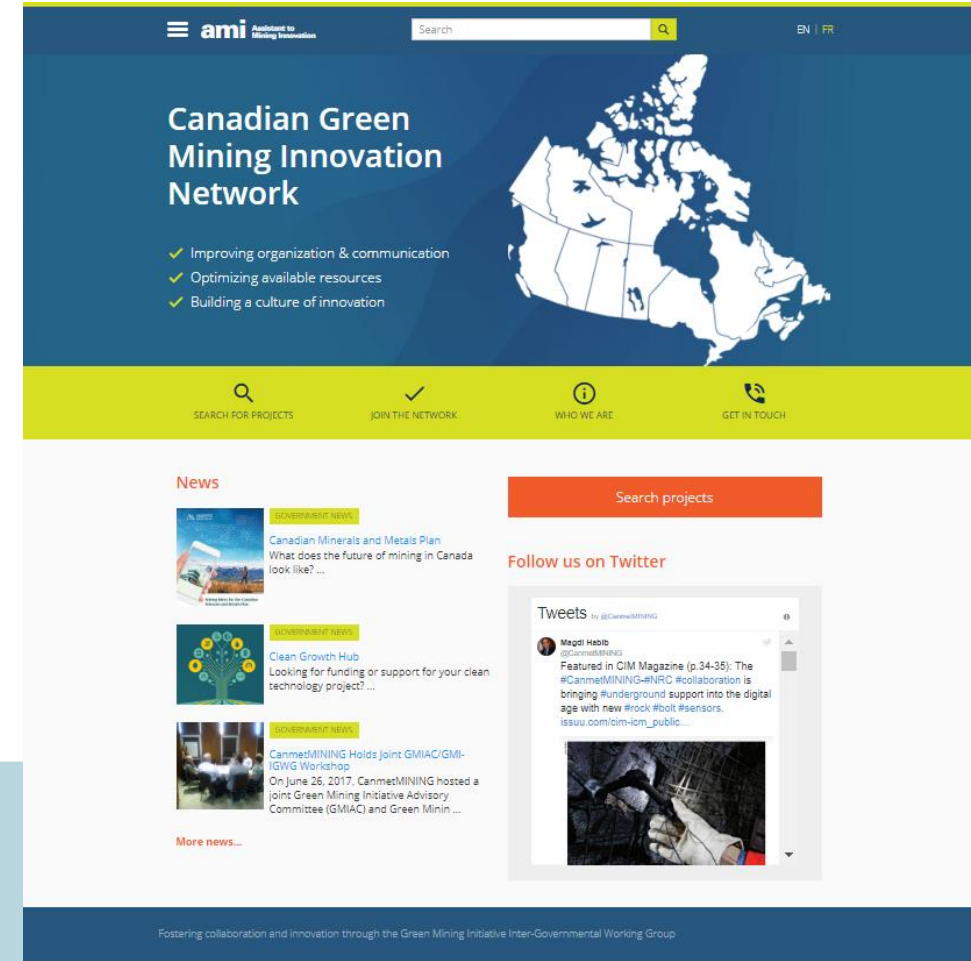
ENHANCING THE MINING INNOVATION INFORMATION HUB AND COLLABORATION TOOL

The goal is to build the Assistant to Mining Innovation into:
- a key information hub for the mining sector and
- a platform to strengthen existing initiatives and build new collaborative initiatives

The Green Mining Innovation Intergovernmental Working Group will continue to explore:
- how the Assistant to Mining Innovation can increase its value to innovators to support collaboration; and
- how initiatives such as the Mining Value from Waste research program and the Canadian Mining Science and Engineering Laboratory Network can best leverage the site.

www.ami-aim.ca

CONCLUSION

1) The pilot project used to test the National Collaboration Strategy for the Mining Industry, which was approved at EMMC 2017, was successful in increasing collaboration between different stakeholders, including industry. Further work will be undertaken to identify similar opportunities.

2) The success of the Assistant to Mining Innovation as a platform to support collaboration will depend on the participation of stakeholders in providing information on their projects. Further opportunities for the platform to support collaboration will be identified.