



The Mining Association
of Canada | L'association minière
du Canada

The Stage Has Been Set

Presentation to the Canada Mining Innovation Council National Mining Innovation Forum

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Federal Budget 2016 lays out key “mandate” priorities:

- ◆ Growth for the Middle Class
- ◆ A Better Future for Indigenous Peoples
- ◆ A Clean Growth Economy

Addressing climate change spans across the above priority areas

MAC and CMIC have positioned the Canadian mining industry well to be a constructive partner to government in advancing these priorities

Growth for the Middle Class:

- ◆ Infrastructure: \$120 billion over 10yrs in two phases:
 - ◆ Phase II: ~\$110billion prioritized to go “hand-in-hand with the transition to a low-carbon economy
- ◆ Innovation:
 - ◆ Innovation Agenda policy initiative to support broader climate change and clean economy goals:
 - ◆ “\$800 million over four years, starting in 2017–18, to support innovation networks and clusters.”
 - ◆ “Over \$1 billion over four years, starting in 2017–18, to support clean technology, including in the forestry, fisheries, **mining**, energy and agriculture sectors.”
 - ◆ Resource sector named as a target

A Better Future for Indigenous Peoples

Minister Bennett mandated to work in partnership:

- ◆ “to improve essential physical infrastructure for Indigenous communities”
- ◆ “to promote economic development and create jobs for Indigenous Peoples”

Indigenous economic development essential to reconciliation agenda

Climate change, innovation, infrastructure and indigenous reconciliation intertwined in remote and northern regions

These policy priorities can only be achieved in concert

A Clean Growth Economy

Investing in Clean Technology:

- ◆ Accelerating clean technology development
- ◆ Electric/alternative fuel vehicles

Addressing climate change:

- ◆ Supporting energy efficiency and renewable energy development
- ◆ Supporting adaptation to a changing climate

CMIC as Industry's Answer

Towards Zero Waste Mining maps well to these priorities:

- ◆ Continuous underground mining will reduce energy consumption, GHG emissions and waste bi-products
- ◆ Transforming mineral processing can massively reduce waste by replacing current mill technology and developing low-grade waste energy recovery
- ◆ Electric mining haul fleet reduces/eliminates diesel reliance, associated emissions, and reduces waste heat by 50%

Mining Industry is Showing Leadership

- ◆ In 2013, Canadian mining and metals companies invested \$677 million in R&D
 - ◆ Higher than that of the machinery sector, the pharmaceutical sector, and the wood products and paper sector
- ◆ In 2013, the industry employed 4,560 people in R&D
 - ◆ More than the pharmaceutical and forestry sectors, which both receive extensive financial and policy support from the government

MAC Working with Members

- ◆ Established a MAC Board Innovation Task Force to:
 - ◆ provide executive direction to MAC on its interface with government on mining innovation
 - ◆ direct MAC's engagement with, and support for, CMIC
 - ◆ identify options for establishing a mining innovation model supported by government
- ◆ Conducted a survey of members to understand corporate research, development and innovation priorities and activities

Top MAC Member Research, Development and Innovation Priorities

- 52%: Energy consumption and recovery, alternative fuels and renewable energy
- 48%: Water Management and treatment
- 43%: Metallurgy and ore processing
- 35%: Mine closure, remediation and reclamation
- 26%: Health and safety
- 17%: Automation and robotics

Sampling of Current Research, Development and Innovation Projects

- ◆ Fuel switching: LNG, solar energy, wind turbines, and energy storage
- ◆ Robotics in mining operations, including autonomous trucks
- ◆ Sensor-based ore sorting to divert waste from the mill
- ◆ Thermal rock fragmentation
- ◆ Non-aqueous ore processing to reduce/eliminate water use
- ◆ Fatigue management in mobile equipment and in stationary sedentary roles
- ◆ Alternatives for material transportation, including conveyors, pipelines and rail-based systems
- ◆ Bio-mining using bacteria as an alternative to cyanide
- ◆ Technologies and strategies for mine closure

Partners in Current Research, Development and Innovation Highlight an Opportunity

- ◆ Of all of the current research, development and innovation projects, only 6 reported partnering with the federal government
- ◆ Top partners are:
 - ◆ Suppliers (31 projects)
 - ◆ Consulting firms (22 projects)
 - ◆ Academia (19 projects)
 - ◆ Other mining companies (18 projects)
- ◆ Highlights the significant gap with respect to the federal government, and the potential opportunity

- ◆ MAC working with CMIC to deliver the message that ensuring successful industry innovation will take significant investment from both industry and government
- ◆ Reinforcing the message that there is strong alignment between CMIC and the Government of Canada's clean technology priorities
- ◆ Delivered this message as part of lobby activities on May 12 during National Mining Week
- ◆ MAC has been meeting with senior officials of various departments and Minister's staff
- ◆ Feedback so far has been positive, with a recognition of the importance of the mining industry, and a recognition of the alignment with federal priorities

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