



NATURAL RESOURCES CANADA - INVENTIVE BY NATURE

Mining Innovation: *The Importance of Science Enterprise*

Donna Kirkwood, Ph.D, Geo
Deputy Chief Scientist
Natural Resources Canada

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2

MDEC: *A Collaborative Model*

- **MDEC is:**
 - A proven success for S&T collaboration on the reduction and control of diesel emissions in mining environments + energy efficiency
 - A wide-reaching platform to disseminate research results
- **Working together on finding safety/environment solutions and developing opportunities for an important sector of Canada's economy:** Products and services providers to the global mining sector – from mining equipment to mine engineering firms, from medical to emissions control technologists

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The Importance of *Science Entrepreneurship*

- S&T collaboration as a model of *Science Entrepreneurship*
- Support for science is an essential pillar of the Government of Canada's strategy for sustainable growth
- Integration of scientific considerations in investment and policy choices
- Relevance of Natural Resources Canada's scientific and technological know-how

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CanmetMINING: *Innovation through Collaboration*

- Assisting mining sector through exploratory research, task/cost-shared R&D, cost-recovery specialized services and technology transfer = high collaboration
- Examples of Collective Leadership: mine ventilation, alternative energy vehicles, Green Mining
- With, among others: CMIC, CEMI, National Research Council, Natural Sciences and Engineering Research Council of Canada, etc.

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Growth in Clean Technology

- *“... support innovation and the use of clean technologies in our natural resource sectors, including the mining sector...”*
(Mandate Letter: Minister of Natural Resources)
- *“Investing in the research, development and demonstration of new clean technologies accelerates the innovation required to bring technologies closer to commercialization. This will help meet climate change objectives, increase the productivity and competitiveness of Canadian firms, and create clean jobs.”*
(Excerpt, Budget 2016)
- Let'sTalkCleanResources.ca – a focal point for discussion of clean tech in the natural resource sectors

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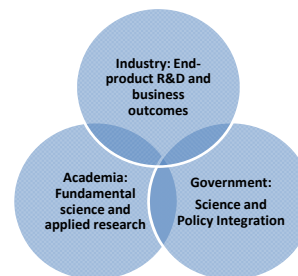


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Science Enterprise: Government of Canada's Role

- Science and innovation is becoming an “open” enterprise with growing expectations by the public to rapidly access publicly-funded information and results in support of government decision-making.
- NRCan plays a unique role in the natural resources innovation system as a performer, user, funder and communicator of S&T to provide evidence in support of sustainable resource development.
- Well positioned among federal Science-based Departments & Agencies: long and distinguished record of providing S&T leadership to support government decisions

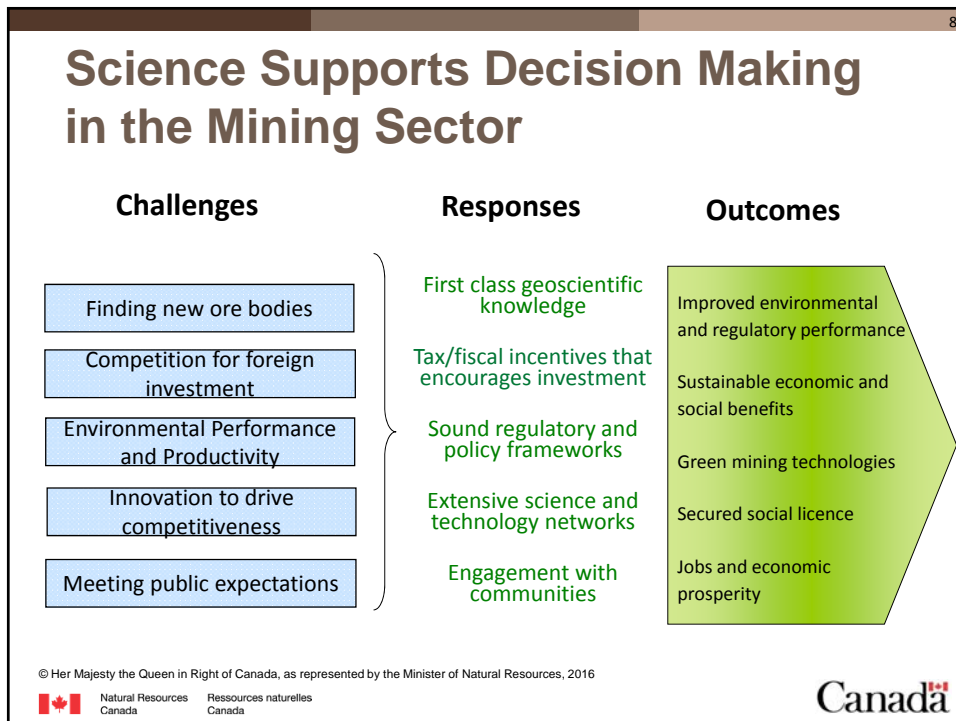
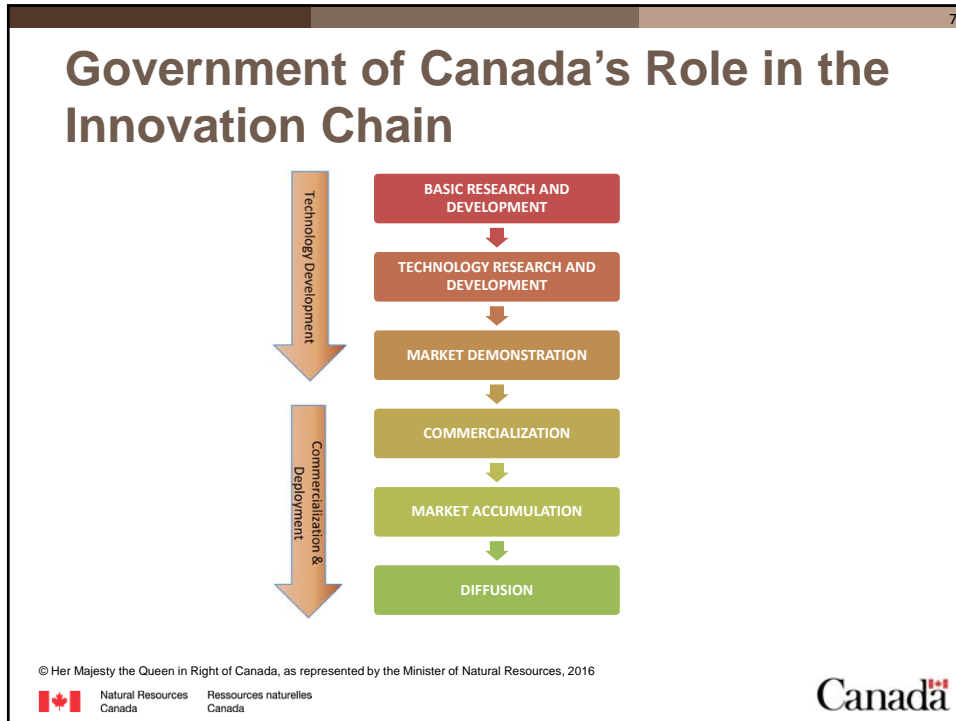


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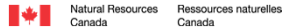
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Science Foundation for Public Confidence

- 2016 Energy and Mines Ministers' Conference theme: *Enhancing Public Confidence in Canada's Natural Resource Sectors*
- Governments published a compendium of case studies demonstrating positive approaches to building confidence in energy and mineral development
- Ministers agreed to develop a joint action, which will reflect the importance of building and maintaining confidence along the full lifecycle of resource development projects

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Enhancing Public Confidence: *Informing Environmental Assessment Decisions*

- NRCan research results are free and publicly-available (journal articles, science reports, etc.).
- Ensuring that NRCan's advice is comprehensive and understandable is a key element.
- NRCan provides its S&T expertise to decision bodies – including CEA Agency, NEB, CNSC, and Northern EA boards .
- Last year, NRCan scientists provided advice for 43 major development projects (e.g. Ajax Copper-Gold Mine, Back River Gold Mine).



NRCan research and expertise on environment-project interactions (e.g. landslides, earthquakes or other geo-hazards).



NRCan conducts broad research related to the management of tailings for oil sands and metal mines, and reducing their impacts on the environment.



NRCan researchers provide advice on permafrost-infrastructure interactions under current and future climate conditions.

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Science Supports Policy Advice to Government

- Aligning NRCan's S&T agenda with that of industry, academia, Government of Canada, etc.:
 - Drives innovation and productivity,
 - Enhances collaborations and partnerships and
 - Helps attract a skilled labour force.
- H.R. recruitment policy choices to support industry needs:
 - Government of Canada's *Youth Employment Strategy (YES)*
 - NRCan's *Science & Technology Internship Program (STIP)*
 - MDEC's Scholarship Fund

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Conclusion: *Mining and Clean Technology Perspectives*

- Natural resource companies are important innovators and major adopters of clean tech, and an integral part of the *Science Enterprise*:
 - Collaborating with partners like NRCan and CanmetMINING
 - Communicating to enhance public confidence
 - Applying S&T to investment and policy decision making
 - Fostering the next generation of S&T experts
- Current climate offers great opportunities:
 - New investments in academic centres
 - Enhanced Granting Councils
 - New innovation agendas
 - New Canada Excellence Research Chairs

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