



## ONTARIO MINING: AN AGENDA FOR SUSTAINABLE GROWTH THROUGH INNOVATION

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### Shared Focus on Innovation

The recent downturn in global markets offers some important lessons for the Ontario mining sector, among them, the need to go beyond natural competitive advantages and develop innovative strengths. Innovation is widely considered to be a very important determinant of global competitiveness and future success: increasingly, mining industry leaders, governments, investors and academics are rallying behind this notion. However, the level of coordinated, far-sighted action taken on innovation does not correlate with the rhetoric. For Ontario mining to attract investment, grow sustainably, maximize value for society and the environment, and serve as an exemplary mining jurisdiction globally, we need a strategy that balances short and long term goals, harnesses inputs from a variety of stakeholders and delivers a step change in the way we mine.

The following is intended to define our pathway to innovation success, guided by the mandate set for the Minister of Northern Development and Mines by Ontario's Premier: *"[to work] with the Minister of Economic Development and Growth, as well as key stakeholders, to build on the Ontario mining cluster's competitive advantage to address transformative, world-class research and commercialization opportunities through the cluster planning and brain-belt initiatives."*

### Alignment on Strategic Priorities

Ontario mining companies' profitability is challenged by the combination of falling or stagnant global commodities prices and rising input costs. In particular, our jurisdiction has high labour, energy and capital costs, which limit revenue potential and dampen investment, especially in difficult economic times. Declining ore grades at current depths are forcing companies to mine deeper, significantly increasing extraction costs and technological challenges, as well as introducing new safety concerns.

Mining companies have long understood the imperative to adopt new technologies and management systems to increase productivity, protect the environment and reduce fatalities. With safety as the top priority for Ontario miners, there has been a sustained, collaborative effort between government and the private sector on adopting the highest standards possible and working toward zero harm. The result has been an impressive 96% improvement in lost time injury (LTI) frequency over the past 30 years, making Ontario one of the safest mining jurisdictions in the world and mining one of the safest industries in the province. In 2016, there were no fatalities in Ontario mines – a significant achievement marking another step toward achieving zero harm, and a testament to the efficacy of collaboration and partnerships in driving exponential results. This same approach also can also help us to build competitive advantages, while linking societal outcomes with business and economic success in the following priority areas:

- Health, safety and communities – **mining with ZERO HARM**
- Energy and climate – **mining with ZERO CARBON**
- Environment – **mining with ZERO WASTE**
- Prosperity and global competitiveness – **unlocking PRODUCTIVITY GROWTH**

# TARGET ZERO +

— Zero Harm — Zero carbon — Zero Waste + Productivity Growth

## Blueprint for Success

**ZERO HARM** objectives will be met through implementation of the recommendations in the [Mining Health, Safety and Prevention Review](#) (2015). The Ontario Mining Association was assigned as lead on recommendation 6.1 (develop an Internal Responsibility System best practice guideline as an industry benchmark). Through collaboration with Workplace Safety North and the Institute for Work & Health, this work is complete. As well, an IRS climate assessment was developed, piloted and approved by labour and management representatives. The following excerpt from the Mining Review outlines the overall approach to addressing mining health and safety:

*“To mitigate key health and safety hazards in Ontario’s underground mines, the Review developed a series of recommendations that will: strengthen existing legislation; help to focus the efforts of the Mining Legislative Review Committee on the highest risk health and safety hazards in the mining sector; and encourage the development/adoption of best practices and new technology to improve health and safety.*”

While we continue to build on our achievements in safety, the successful approach adopted in this field needs to translate into other areas of mining operations. A key to driving organizational breakthroughs is not to work in isolation: entering alliances, pooling ideas, talent and resources has worked well to deliver results for all health and safety stakeholders. Similarly, companies operating on Canada’s oil sands have created the [Canadian Oil Sands Innovation Alliance](#) (COSIA) to develop performance improvement initiatives for the entire industry. The alliance has proved to be effective in creating ways for the industry to handle environmental issues.

A similar alliance could be beneficial to Ontario’s mining industry, as it would help create a cohesive plan for industry-wide improvement. Without a cohesive plan, individual companies may act independently but, in addition to costly inefficiencies caused by lack of coordination, there would be no accountability. Mining innovation hubs, such as the [Canada Mining Innovation Council](#) (CMIC), [Centre for Excellence in Mining Innovation](#) (CEMI) and [Mirarco Mining Innovation](#), are emerging as a source of creative solutions by enabling greater collaboration among industry leaders, government, academia and technology start-ups. Indeed, industry-academia/start-up partnerships for the development of technologies are an appropriate solution to issues faced by both parties: industry gains access to research at lower prices, academia/start-ups have access to increased funding, and both parties are able to work towards the development of relevant technologies for immediate implementation. As a policy, TARGET ZERO+ is an ambitious, but achievable goal. Allowing industry members to participate in the development of an industry-wide initiative is crucial to the success of any plan, as it will already have the agreement of those to whom it applies.

*OMA vision is to make Ontario mining the cleanest, most productive, technologically-advanced and socially responsible in the world.*

## Working Together on the Mine of the Future



As a result of shifting dynamics in global supply and demand, mining companies are turning to innovation to uncover efficiency gains to enhance shareholder value. Innovation can drive more than cost reductions, however. It can help mining companies mitigate and manage risks, strengthen business models, attract investment and foster more effective community relations. It can help mining service companies enhance their value to the industry by developing new products and services, and broaden their prospects by sharing their expertise with the world. Ontario miners understand this, as they leverage learnings from other industries and explore the benefits of battery storage technologies, electric vehicles, digitalization, automation, smart control technologies, ventilation on demand, 3D printing, artificial intelligence and other components of the mine of the future.

Longer-term, innovation can position the Ontario mining industry in a leadership position on such critical issues as health and safety, environmental performance and sustainability, climate change and clean energy usage. Mining already produces the building blocks of innovation, given that minerals and metals are essential, irreplaceable components of modern technology—from lifesaving medical devices to hybrid cars and advanced energy technologies. We can enhance our value further, by becoming a sustainability leader among industries, while achieving the government’s objectives on carbon reductions, environmental stewardship and establishing an innovative green economy. Cleaner practices and sustainable processes adopted by mines, can be replicated in other sectors, enabling industry, government and other stakeholders to jointly accelerate the pace and scope of innovation and beneficial societal outcomes.

Although specific deliverables and timing are yet to be developed, the initial focus on **ZERO CARBON**, as well as energy efficiency and conservation initiatives, is in keeping with the following priorities outlined in the Ontario Premier’s [mandate letter](#):

*“Continuing to work with the Minister of the Environment and Climate Change in implementing the Climate Change Action Plan, advancing mining innovation in a low-carbon economy and, in particular, accelerating the development and commercialization of clean technologies that will support greenhouse gas emissions reduction across the mining sector.”*

*“Working with ministers of Economic Development and Growth, Research, Innovation and Science, and the Environment and Climate Change, and partner ministries to strengthen the low-carbon clean tech sector, update regulatory requirements, help support and deploy low-carbon technologies in Northern Ontario, and advance development and adoption of low carbon mining technologies through the mining innovation cluster.”*