

## MAC Response to the Community of Interest Panel's Advisory Statement on Climate Change, “Rising to the Challenge”

### Executive Summary

The Mining Association of Canada (MAC) and its members are committed to supporting an orderly transition toward a lower carbon future, and to being a constructive partner to the Government of Canada in the development of public policy to address climate change. MAC is equally committed to an ongoing and meaningful dialogue with our Community of Interest Advisory Panel (COI Panel) on issues of mutual concern, including climate change.

On November 4, 2016, the COI Panel released [\*Rising to the Challenge: Advisory Statement on Climate Change to MAC and MAC Members\*](#) (the Panel Statement).<sup>1</sup> The Panel Statement proposed specific ideas and actions to assist MAC and its members in building on the progress they have already made in addressing climate change, and to help guide future endeavours with respect to planning, managing and operating mines and related activities.

Upon receipt of the Panel Statement, MAC committed to reviewing and issuing a formal response. What follows is MAC's response to the Panel Statement.

MAC would like to take this opportunity to thank the COI Panel members for providing us with a thoughtful and constructive statement on climate change. Engaging with us in this respect has been a useful and instructive process in better understanding where our strengths are in the climate change space, and where we can improve our performance. Looking ahead, we remain committed to carrying this dialogue forward with the aim of improving performance through targeted actions.

### The MAC Community of Interest Advisory Panel

The Panel was created in 2004, alongside the launch of the *Towards Sustainable Mining*<sup>®</sup> (TSM<sup>®</sup>) initiative. The Panel is an independent, multi-interest group comprising individuals from Aboriginal groups, communities where the mining industry is active, environmental and social NGOs, and labour and financial organizations.

The Panel serves as a platform for communities of interest and MAC members to discuss and collaborate on issues of mutual concern. A key role of the Panel is to provide advice on current and emerging priority issues and to encourage member companies to improve social, environmental and economic performance. More information about the Panel can be found on MAC's website: [www.mining.ca/tsm](http://www.mining.ca/tsm).

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<sup>1</sup> See Appendix A for a full copy of the statement.

## What we Heard from the COI Panel

In both the Panel Statement and through several engagements with the Panel on this subject, MAC heard the following with respect to climate change:

- That MAC and MAC members are directionally correct with respect to climate change, and that there is support for our industry’s recognition that climate change is an issue that we need to contribute to solving, both in the policy space and in practice.
- That the Panel recognizes the constructive efforts that MAC and its members have taken to address climate change through *TSM* and through additional company actions, including on-site and community projects.
- That there is a “climate change best-practice” spectrum on which MAC members are differently situated, and that the COI Panel would like to see companies progress further on this spectrum.
- The Panel believes that MAC and its members are well positioned to build on their efforts to address climate change, both in the policy space and in practice, and specifically in the following ways:
  - Further integrate climate change elements into *TSM*.
  - Enhance climate change risk assessment, awareness and mitigation at the mine-site level.
  - Increase awareness of the climate-related challenges experienced by communities of interest, and assess how capacity building and support to address these challenges can be meaningfully enhanced.
  - Communicate the industry’s role as a supplier of minerals and metals that are critical for the transition to a lower carbon future.
  - Encourage the mining industry’s supply chains to do their part to address climate change, capitalizing on mining company influence on service providers.
  - Explore partnerships for climate change public policies that would create additional value for the mining industry and the communities where we operate, including Indigenous communities mine workers.
  - Work in partnership with the financial sector to develop meaningful and balanced disclosure criteria for climate change-related risks and opportunities associated with mining.

## Summary of MAC Actions in Response to the Panel Statement

Below is a summary list of 13 actions MAC is committing to undertake based on the Panel’s recommendations. Further in the document is a more detailed and contextual response to each of the Panel’s individual Calls to Action.

1. Look for opportunities to more explicitly link *TSM* protocol requirements to climate change action, including the inclusion of climate-related terms, definitions and criteria, and implement those where appropriate.

2. Include references to appropriate tools for climate risk assessments and disclosures within the *TSM* protocol guidance documents as we complete scheduled reviews and updates.
3. In relation to the Panel's recommendations for changing the criteria for Levels A, AA and AAA of the *TSM Energy Use and GHG Management Protocol*, MAC will canvass members that have achieved those levels to identify how achievable the recommended changes are, and in what timeframe, with a commitment to report back to the COI Panel for further dialogue.
4. Continue active advocacy for government investment in innovation to help the industry enhance energy, fuel and process efficiency at the mine site.
5. Continue engaging in Natural Resources Canada's Adaptation Platform Mining Working Group and the Mine Environment Neutral Drainage Program, a key mechanism for advancing risk management and modelling related to climate change over the last decade.
6. Investigate the addition of specific wording to the energy and GHG emissions management protocol to enhance internal engagement, education and empowerment of mine site workers with respect to climate change and energy management, as consistent with ISO 50001 to which our protocol is aligned, and implement as appropriate.
7. Facilitate an exploratory dialogue with the Canadian Wind Energy Association, the Canadian Solar Energy Association, our membership and the MAC COI Panel with the aim of better understanding:
  - The state and trajectory of renewable technology development, permitting and renewable technology deployment in the Canadian context.
  - The opportunities and limitations with renewable energy production and storage technologies for mining companies.
  - The opportunities for potential partnerships between MAC members and their Indigenous communities of interest, including in the areas of technology training and capacity building.
8. Explore opportunities for joint advocacy with Indigenous and other organizations on the role that governments should play to address food security in remote and northern regions.
9. To better leverage supply chains in the transition to a lower carbon economy, MAC will continue supporting the Canada Mining Innovation Council (CMIC), whose supply chain approach is designed to ensure rapid co-development and deployment of solutions that the industry needs.
10. Consistent with our [\*Principles for Climate Change Policy Design\*](#), and recognizing the opportunity to work in partnership with other organizations on common objectives, MAC will continue promoting:
  - The industry's actions to address climate change and to protect the environment.
  - The industry's role in providing the raw materials needed for a lower carbon future.

- The need for policies that meaningfully reduce GHG emissions reductions while protecting the competitiveness of emissions-intensive and trade-exposed sectors, like mining, and that are sensitive to the unique challenges faced by Canada's remote and northern regions.
11. Acknowledging the need for policies in support of workers, MAC will review the "Getting It Right" report – a union-prepared document that shares experience-based learnings on transition planning as derived from the Province of Alberta's decision to phase-out coal-fired electricity generation. This will constitute a first step toward engaging with unions for further dialogue in this space.
  12. Continue to disclose GHG emissions levels and relevant metrics, and continue promoting the need for a "one-window" approach for climate change data disclosure across jurisdictions.
  13. Work with the COI Panel to identify key financial sector representatives with the aim of hosting a workshop the objective of which is to explore pathways toward achieving a suitable, singular, streamlined and comprehensive climate change risk disclosure approach.

### **MAC Engagement on Climate Change**

In response to the Kyoto Protocol, and in support of a credible response to climate change, MAC released its [first climate change statement](#) in March 2000. In the years following, MAC undertook several measures to improve its membership's performance in energy and GHG emissions management. In 2004, MAC and its members launched the *TSM* initiative, which requires facilities to implement comprehensive energy use and GHG emissions management systems, report their energy use and GHG emissions management performance and to set targets. In 2009, MAC also adopted the International Council on Mining and Metals' Climate Change Policy. These industry-wide actions have been complemented by a host of individual member company actions to improve energy and fuel efficiency, reduce GHG emissions, and improve environmental performance. They also underscore the mining industry's long-held recognition that we need to be part of the solution to addressing climate change

In April 2016, to assist government in the development of an effective pan-Canadian climate change plan, MAC released [Principles for Climate Change Policy Design](#). In that document, in addition to supporting a revenue neutral price on carbon, MAC underscored the need for any climate change policy to ensure the competitiveness of emissions-intensive and trade-exposed sectors, as well as the necessity of being sensitive to the geographical realities of remote and northern regions.

Canada is a global leader in sustainable mining practices, and MAC members are among the most responsible companies operating throughout the world. Ensuring that Canada remains a competitive jurisdiction for current operations, and future mineral investment, is essential to prevent carbon leakage. Policy-driven carbon leakage would see Canadian mining, a significant engine of the Canadian economy, needlessly damaged with no net gain in GHG emissions reduction. Further, carbon leakage could lead to a significant increase in global GHG emissions, resulting in less environmentally-responsible jurisdictions absorbing lost Canadian market share.

Over the past year, MAC has remained actively engaged in public policy and regulatory consultations stemming from the Vancouver Declaration and the Pan-Canadian Framework on Clean Growth and Climate Change, and will continue to do so.

## **TSM and Climate Change**

Shifting from policy to mining practice, MAC's *TSM* initiative is an award-winning international performance system that helps mining companies evaluate and manage their environmental and social responsibilities. *TSM* is the only mining program in the world that requires public reporting of site-level performance, the results of which are independently verified by a third-party. Every MAC member company commits to implementing *TSM* at their Canadian facilities as a condition of membership, and many have voluntarily applied it to their international operations. Global uptake of *TSM* continues to grow with the recent adoption of the program by the national mining associations of Finland, Argentina and Botswana.

One of *TSM*'s six protocols focuses on helping facilities manage their energy use and reduce GHG emissions. To achieve the program's good practice standard (Level A, which is aligned with ISO 50001 certification) for the *TSM Energy Use and GHG Emissions Management Protocol*, a facility must show its management system includes assigned accountability from senior management, and that it has a process in place to ensure energy data are reviewed regularly and are well integrated into operator actions. Facilities are also expected to provide energy awareness training, and have systems in place to track and report energy use and GHG emissions data for both internal and external reporting. To achieve Level AAA, the highest performance level, companies must demonstrate their support for community projects or capacity building in the energy efficiency space. Finally, in *TSM*'s spirit of continuous improvement, this protocol seeks to confirm that facilities establish and meet targets with respect to their energy use and emissions.

Beyond this protocol, there are requirements throughout *TSM* that are directly linked to climate change risks and actions. For example, the *TSM Safety and Health Protocol* requires facilities to conduct a hazard identification and risk assessments to identify climate change-related risks and opportunities, and ensure implementation of mitigation, adaptation and/or resiliency measures. Similarly, the *TSM Crisis Management and Communications Planning Protocol* requires corporate offices and facilities to identify credible threats and risks and establish protocols to address them. Additionally, the *TSM Biodiversity Conservation Management Protocol* requires facilities to identify potential risks and impacts to biodiversity, set objectives for those aspects deemed to be significant and develop action plans to achieve those objectives. Minimizing the industry's impact on biodiversity is a critical component of climate change action.

Beyond *TSM*, individual MAC member companies have improved energy efficiency and reduced emissions through innovations at the mine-site level. Beyond emissions reductions and efficiency improvements, companies frequently work very closely with local communities on issues that pertain to climate change, such as energy and food security. For a list of member projects, please see Appendix B.



## MAC Response to the MAC Community of Interest Panel's Advisory Statement on Climate Change, "Rising to the Challenge"

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### COI PANEL CALL TO ACTION #1: TOWARDS SUSTAINABLE MINING PROGRAM

***Rationale:** MAC's Towards Sustainable Mining® program ("TSM") is focused on continual improvement that is credible and responsive to the expectations of communities of interest. The ongoing development of TSM provides opportunities to go beyond existing efforts, and expand its focus on climate change in such a manner that the urgency of the current situation, the increasingly stringent government reporting requirements, and the opportunities afforded to demonstrate pro-active leadership in addressing climate change can be taken into account.*

TSM presents the mining sector with an excellent vehicle to support the management of climate change risks and opportunities. One of TSM's six protocols focuses on helping facilities manage their energy use and reduce GHG emissions, and others have climate-change related elements embedded into them.

MAC's TSM initiative is an award-winning international performance system that helps mining companies evaluate and manage their environmental and social responsibilities. TSM is the only mining program in the world that requires public reporting of site-level performance, the results of which are independently verified by a third-party.

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<sup>2</sup> See Appendix A for a full copy of the statement.

**For this Call to Action, the COI Panel recommended that MAC and MAC members:**

- 1.1. In the course of implementing MAC's strategic priorities, systematically review TSM, including all TSM documents (i.e., Guiding Principles, protocols, frameworks and guides), to explicitly integrate consideration and references to climate change, including mitigation and adaptation and resiliency measures.**

TSM protocols are designed to take systematic, risk-based approaches to managing various health, safety, environment, and community aspects of the mining business. We believe that the criteria necessary for addressing climate change risks and opportunities are presently well integrated throughout the various TSM protocols, both directly and indirectly. That said, MAC and its members are committed to continuous improvement, and we regularly adjust aspects of the program to ensure they represent leading practices.

Acknowledging this, MAC commits to working with the COI Panel to more explicitly link protocol requirements to climate change action, both with respect to the advice in this statement, and in our ongoing dialogue in the climate change space. MAC maintains this same commitment as part of our broader engagement in meaningful dialogue with the COI panel on how the industry can improve its performance (MAC Action #1).

### **Overview of TSM Protocols and Climate Change**

The TSM protocols already incorporate climate change action. The *TSM Energy Use and GHG Emissions Management Protocol*, for example, requires companies to implement management systems to become more energy efficient and to reduce GHG emissions. It also requires companies to set and achieve performance targets and publicly report on performance at the facility or business unit level.

Beyond this protocol, there are requirements throughout TSM that are directly linked to climate change risks and action, although the protocols do not explicitly use the term "climate change." For example, the *TSM Safety and Health Protocol* requires facilities to conduct a hazard identification and risk assessment. During this process, facilities would identify climate change-related risks and opportunities and ensure implementation of mitigation, adaptation and/or resiliency measures. Similarly, the *TSM Crisis Management and Communications Planning Protocol* requires corporate offices and facilities to identify credible threats and risks and establish protocols to address them. Once again, companies and facilities would be looking at climate change risks as they go through this process. Additionally, the *TSM Biodiversity Conservation Management Protocol* requires facilities to identify potential risks and impacts to biodiversity, set objectives for those aspects deemed to be significant and develop action plans to achieve those objectives. Minimizing the industry's impact on biodiversity is a critical component of climate change action.

Further, recent revisions to MAC's *Guide to the Management of Tailings Facilities* include specific aspects related to climate change. For example, the Guide directs new facilities to consider potential impacts of climate change, including extreme precipitation events (drought or high precipitation) and potential impacts on permafrost in northern areas during the risk assessment process. Risk management should include measures to ensure tailings facilities are resilient enough to continue to manage risks under changing climate conditions, particularly in the long term and through to closure and post-closure. This guidance is directly related to the *TSM Tailings Management Protocol*, as facilities must have an internal audit to



confirm conformance with the Guide to achieve Level A performance.

As a result of the review of the tailings management components of *TSM*, revisions have been made to the *TSM Aboriginal and Community Outreach Protocol*, the *TSM Tailings Management Protocol* and *A Guide to the Management of Tailings Facilities*. The *TSM Aboriginal and Community Outreach Protocol* has a new requirement to engage with communities on risks to the community. This requirement is accompanied by a new Frequently Asked Question that includes climate change as a topic that may be of interest to communities of interest.

With all of the above said, the practices related to managing climate change risks and opportunities continue to evolve, and it is prudent for MAC and its members to track these developments.

**1.2. In TSM guides, include reference lists to appropriate tools for climate risk assessment and disclosure.**

In addition to the *TSM Energy Use and GHG Management Protocol*, MAC produces and maintains a comprehensive guide to the development of energy and GHG management systems to support members in this space. Examples of guidance focused on appropriate climate-related tools and disclosure include sections on:

- Setting appropriate boundaries for determining your carbon footprint;
- Identifying emissions sources within your footprint;
- Choosing appropriate emissions factors;
- Developing reduction strategies for GHG emissions; and
- Planning and setting targets.

MAC supports the approach of including references to appropriate tools for climate risk assessments and disclosures within the protocol guidance documents. As we complete our review and updates of our guidance documents, we will incorporate such references (**MAC Action #2**).

The *TSM Biodiversity Conservation Management Protocol* includes a reference list of resources from other organizations, which includes guidance on biodiversity and climate change. MAC is open to adding relevant references to the other protocols as well.

**1.3. Strengthen expectations of MAC members regarding climate change to meet at least the Level A requirements in the TSM Energy Use and GHG Emissions Management Protocol, especially around performance. Additionally, consider making current requirements for Level AAA in the Protocol, such as going beyond energy efficiency and savings and reporting scope 3 emissions, necessary to obtain a Level AA rating. An enhanced Level AAA rating could include extra measures such as demonstrated implementation of the MAC Principles for Climate Change Policy Design, mandatory climate risk disclosure and required educational and training initiatives on emission reductions.**



The *TSM Energy Use and GHG Emissions Management Protocol* was designed to improve energy efficiency and reduce GHG emissions across the mining industry. The protocol measures a facility's ability to track and report energy data, as well as establish and meet targets. Through comprehensive management systems, *TSM* helps mining operations reduce emissions that contribute to climate change.

In 2013, the protocol and the *TSM Energy Use and GHG Emissions Management Reference Guide* were significantly updated to include leading practices related to responsible energy and GHG emissions management. In fact, the protocol is now closely aligned with ISO 50001.

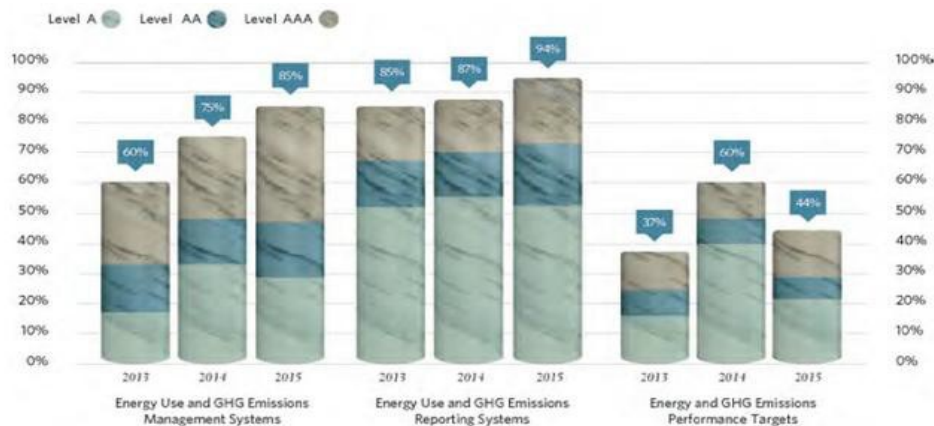
To ensure continuous improvement, MAC has developed a multi-year plan for *TSM* that will include a schedule to ensure the *TSM* protocols are regularly reviewed. MAC will take the advice from the COI Panel into consideration during the next review of the *TSM Energy Use and GHG Emissions Management Protocol*, which is scheduled to be reviewed in 2019, and remain engaged with the COI Panel as revisions are made (Related to MAC Action #1).

Beyond this, and acknowledging our membership's spread in performance across the protocol, MAC will canvass members that have achieved Levels A, AA, and AAA to identify how achievable the above recommendation is, and in what timeframe, with a commitment to report back to the COI Panel for further dialogue (MAC Action #3).

### Overview of Recent TSM Performance

Highlights from the most recent *TSM Progress Report* on the *TSM Energy Use and GHG Emissions Management Protocol* include:

- 85% of have comprehensive energy use and GHG emissions management systems.
- 95% have implemented energy use and GHG emissions management reporting systems.
- 44% have established and met performance targets.



#### 1.4. As TSM evolves, include appropriate climate-related terms, definitions and criteria in all other Protocols, especially Biodiversity Conservation

***Management, Tailings Management, Crisis Management, and Water (once approved).***

As the TSM protocols are updated and new protocols are developed, MAC will look for opportunities to integrate the COI Panel's recommendation to incorporate climate-related terms, definitions and criteria, similar to what has been done to the tailings and Aboriginal and community outreach protocols (Related to MAC Action #1).

With respect to water stewardship, MAC introduced a *TSM Water Policy Framework* in 2015 that includes elements related to mitigation and adaptation for flooding. MAC's work in this area will continue throughout 2017 as it explores the feasibility of a TSM protocol dedicated to water stewardship.

**1.5. *Add climate change considerations, terms and requirements into the Frameworks around Aboriginal and Community Outreach, Safety and Health, Mine Closure, and Energy Use and GHG Emissions Management.***

MAC will take the advice from the COI Panel into consideration during the next review of these protocols, which are scheduled to be reviewed in 2019. MAC will engage with the COI Panel as revisions are made (Related to MAC Action #1).

**COI PANEL CALL TO ACTION #2: OPERATIONS LEVEL**

***Rationale:*** *The mine site, processing plants (i.e., mills) and smelters have historically been a focus for emission mitigation and energy efficiency activities. While efficiency improvements have already led to significant emission reductions, operational-level actions centred on continuous improvement should remain an important focus for additional action on climate change.*

MAC and its members support this view. We believe that continuous improvement is an integral practice to ensure that our operations not only continue to contribute to GHG emissions reductions, but maintain overall competitiveness. Beyond TSM, individual member companies have undertaken initiatives to improve energy and fuel efficiency, reduce GHG emissions, and improve environmental performance. Acknowledging that the mine and processing sites are primarily where companies consume energy, the operations level will remain a key focus for MAC members going forward as they seek to improve efficiency and reduce GHG emissions.

Effective energy management has been a long-standing area of focus for MAC members. In 2014, energy costs accounted for \$3.3 billion, ranking third highest among total industry costs. Because mining companies sell their products at prices set by international markets, cost management is the primary tool companies have to manage market variability. These structural factors, along with the growing implementation of carbon pricing policies, inherently motivate companies to minimize energy consumption and GHG emissions. This has been the case in this space for decades, and will continue to be so in the future.

***For this Call to Action, the COI Panel recommended that MAC and MAC members:***

**2.1. *Actively implement and incorporate the use of cost-competitive, value-creating, low carbon emission energy production and energy storage***

***technologies in mine-site operations (i.e., expand the use of these technologies beyond demonstration projects, where feasible).***

MAC supports this recommendation, and a plurality of members have success stories in this space (see below for company examples and see Appendix B for a selection of MAC members' projects in this space).

To support operational transition in the energy space, whether enhancing the reliability of renewable generation, increasing the efficiency and applications of diesel and natural gas, or through myriad site-specific process efficiencies, MAC is actively engaged in advocacy for strategic government investment to promote critical innovation to address industry challenges and priorities with respect to energy at the mine site. To meet our industry's goals in this area, which are aligned with the Panel's recommendation, MAC will continue active advocacy for government investment in innovation to help the industry enhance energy, fuel and process efficiency at the mine site (MAC Action #4). Further, recognizing this as a shared priority, MAC would welcome the support of the COI Panel in achieving success in this space.

For example, MAC organized a roundtable in May 2017 with several senior political representatives from key departments (including Infrastructure, Environment and Climate Change, Indigenous and Northern Affairs, Transport and Natural Resources Canada) to discuss how federal programs can support remote and northern mining operations in their transition to a lower carbon future.

***Examples of MAC Members' Initiatives***

The incorporation of viable, cost-competitive, and lower-carbon energy production is an important component of energy management best practice. Some innovative examples from MAC members include:

- Rio Tinto's wind farm at the remote Diavik Mine has reduced the operation's diesel consumption by 10% annually.
- Stornoway's off-grid diamond mine deployed natural gas from the outset of production, which has demonstrated the increasing viability of natural gas as a substitute for high-emitting diesel fuel.
- ArcelorMittal has launched a pilot project to displace Bunker C heavy fuel oil with natural gas in Sept-Îles.
- Agnico Eagle has reduced diesel consumption at its Meadowbank Gold Mine in Nunavut through process innovation.
- At the project development stage, Avalon Advanced Materials has successfully reduced energy use and GHG generation well in advance of construction activities, by introducing a hybrid solar/diesel power generation system.
- A number of Teck's coal mines have increased their use of natural gas in the place of coal over the last decade, resulting in more than 250,000 tonnes of annual CO<sub>2</sub>e reduction.

Success in this space is often dictated by the circumstances specific to each unique mine site. While the above projects were able to be successfully implemented and have helped to

reduce carbon intensity, current levels of technology, the infrastructure deficit in remote and northern regions, and disparate access to renewable energy assets are barriers to these solutions being universally accessible to all companies.

### ***Case Study: Successful Public-Private Partnership in Renewable Technology at the Raglan Mine***

Glencore's successful deployment of a wind turbine and wind storage facility at the Raglan Mine in Nunavik, Quebec (1,800 km from Montreal) is an informative example for storage technologies. Incorporating three energy storage technologies – a flywheel, batteries, and a hydrogen storage loop with an electrolyzer and fuel cells – the 3-megawatt wind turbine and storage unit is seeking to bridge the divide between intermittency and base-load capabilities. In its inaugural year, it saved 2.1 million litres of diesel and reduced GHG emissions by 5.85 kilotons. Looking forward, the technology could reduce the mine's diesel consumption by up to 40%.

This pilot project was made possible through a unique public-private partnership between the Raglan Mine, TUGLIQ Energy and the federal and provincial governments. It serves as a good example of how government policies can help speed up the deployment of innovative and renewable energy solutions. As this project would not have been economically possible for Raglan to implement on its own, the federal government contributed \$7.8 million, the Quebec government \$6.5 million, with the remainder of the \$18.9 million project cost split between Glencore and TUGLIQ. Despite the tremendous potential for similar projects at other mining sites, the cost barrier is significant and government support is necessary. To this end and based on the success of the pilot project, MAC is advocating for a government-funded program that would support broader deployment of this technology package across remote and northern mining operations that have a viable wind resource.

#### ***2.2. Conduct climate change risk assessments that consider direct and indirect risks – such as receding permafrost, increasing frequency and severity of droughts, floods, snow falls and wildfires – at all stages of mine-site design and planning.***

*What we heard from the COI Panel in our April 24<sup>th</sup> engagement: This call to action is directional in nature. It was intended to get companies to think of climate change as a risk multiplier at the operational level, including the potential for a decrease in water supply, the potential increase in forest fire risk, and broader cumulative effects. Further, the COI Panel intended this for companies that may not be top performers in this space as a means to raise awareness and catalyze appropriate management actions to ultimately result in broader best practice adoption across the industry. Finally, the Panel stated that this call to action should complement call to action #6 related to investor disclosure.*

MAC appreciates the clarification from the COI Panel on this specific call to action. With respect to conducting climate change risk assessments, the business of mining is one of risk management, and climate change informs how companies manage risk. At the operations level, just as sites are in the continual process of transformation and adaptation, so too are risks, the tools available to identify and assess them, and the associated best practices for risk management. While MAC members take great care in managing this risk spectrum, we also acknowledge that we must remain vigilant, informed and proactive in this space.

MAC supports this recommendation, and MAC sees alignment with the efforts listed for calls

to action 1.2 and 1.4. Towards that end, MAC will:

- Include references to appropriate tools for climate risk assessments and disclosures within the protocol guidance documents ([Related to MAC Action #2](#)).
- Look for opportunities to further incorporate climate-related terms, definitions and criteria within TSM protocols, similar to what has been done to the tailings and Aboriginal and community engagement protocols ([Related to MAC Action #1](#)).

With respect to linking risk identification with risk disclosure, MAC members have been monitoring the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD). We believe that the final recommendations are likely to establish a precedent for disclosures on climate change risks and opportunities. Stemming from the recommendations of the TCFD, the Canadian Securities Administrators announced a project to review the disclosure of risks and financial impacts associated with climate change. The project will gather information on the current state of climate change disclosure in Canada and internationally, and will include consultation with investors and reporting issuers. MAC members are well positioned to engage in this process.

**2.3. *Implement appropriate adaptation measures based on risk assessments that also account for the considerable uncertainty in modelling climate change risks.***

MAC members strive for continued improvement in managing risks in all aspects of their business, and will continue to do so. As noted in the section above, the business of mining is one of risk management, and climate change informs how companies manage risk. At the operations level, where mining is coordinating the continual process of site transformation and adaptation, risks are dynamic and risk management practices are constantly evolving.

Modelling begins prior to mine site permitting to ensure that site structures (e.g., tailings facilities) have maximum structural integrity across a broad range of possible variables, including a changing climate. Modelling continues during mine production to inform, update and modify mining plans, site-management decisions, timelines, and overall mine-site operations.

A key mechanism for advancing risk management and modelling related to climate change over the last decade has been the Mine Environment Neutral Drainage Program (MEND), of which MAC is the primary funder. MEND has supported many notable studies on this subject and has published several reports and guides that either address or incorporate climate change in various ways. Some notable examples include:

- [Climate Change and Acid Rock Drainage – Risks for the Canadian Mining Sector](#), Sept 2011, MEND Report 1.61.7, Stratos.
- [Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials](#), Dec 2009, MEND Report 1.20.1, CANMET.
- [Cold Regions Cover System Design Technical Guidance Document](#), July 2012, MEND Report 1.61.5c, O’Kane Consultants for AANDC.

In addition to our active support of and participation in MEND, MAC will also continue engaging in Natural Resources Canada’s Adaptation Platform Mining Working Group ([MAC](#)



**Action #5).** The Mining Working Group has identified the following strategic objectives, which MAC believes are aligned with the Panel's call to action in this space:

1. To identify opportunities to build climate change adaptation into existing government policies, management structures and processes, and industry initiatives.
2. To understand cross-sectoral (e.g., mining and transport, mining and water resources, mining and energy) impacts of climate change, and identify opportunities for collaborative adaptation.
3. To better understand the progress of the mining sector (industry and governments) in adapting to a changing climate.

**2.4. *Engage, educate and empower mine-site workers to consider potential climate change risks and creative solutions.***

The mining industry has invested, developed and continues to deliver significant safety and environmental training to engage, educate and empower mine site workers.

The environmental and safety practices, training and engagement that companies share with their workers can be informed by climate change. Experience has determined that training, informed by company commitments to addressing climate change, is typically best communicated to workers in programming more suited to the specific roles and responsibilities they have on the mine site. For example, a mine site worker does not require the same understanding of the company's broader climate change program as a climate change subject matter expert. Ensuring that the worker's performance is aligned to support the company's strategy, initiatives and objectives in this space are most important.

This type of outreach and employee engagement takes many forms. One example of employee engagement comes from Teck Highland Valley Copper's (HVC) Bright Ideas campaign. In 2015, HVC launched the campaign to seek input from employees on how to reduce energy consumption and improve energy efficiency. From changing fan motors to optimizing the design of haul truck boxes to turning off the lights in areas that aren't being used, Bright Ideas can be about anything that saves energy. Bright Ideas has already received ideas on heating/cooling, lighting and pumps that it is estimated to save more than 6.5 terajoules (TJ) of energy and \$150,000 in energy costs when implemented. Employees are encouraged to look for ideas, big and small, on how to reduce energy, then fill out Bright Idea cards and provide them to their supervisors.

Another example is Hudbay's Manitoba operations' Health and Safety Control Plan, which identifies hazards and their associated controls. Weather hazards are subdivided into further categories, such as rain, flooding, snow/ice and storms. The associated controls are designed to mitigate risk by preparing employees to recognize, react and respond to hazards appropriately. These include competence requirements, including skills development, education and experience; procedural, equipment and material controls; measurement requirements; and reaction plans.

Finally, Avalon Advanced Materials' drill site induction training provided to all employees at the site includes reference to opportunities to reduce energy use via efficient use of water, turning down heaters in camp when not in use, and reducing and recycling to reduce the energy use associated with transport of goods and wastes. Avalon was recognized for its use of solar panels and site energy storage at its exploration camp, which significantly reduced diesel use

for heating. Avalon publicly reports its energy use in its annual sustainability report, and the company's data is being utilized by the Prospectors and Developers Association of Canada to advise the exploration industry on how to measure, report and identify opportunities to improve energy efficiency.

Looking forward, ISO 50001, which aligns with the *TSM Energy Use and GHG Emissions Management Protocol*, has requirements for internal engagement and education. During the next review of this protocol, MAC will investigate the addition of specific wording to address this call to action and implement as appropriate ([Related to MAC Action #1](#)).

### **COI PANEL CALL TO ACTION #3: LOCAL AND INDIGENOUS COMMUNITIES**

***Rationale:*** *Local, remote and/or Indigenous communities often experience the earliest and most severe impacts from climate change. Concurrently, energy costs are often high, energy use often relies on high emission sources, and energy sources are often unreliable. This presents an important opportunity for MAC and MAC members to work with government, industry, and local and Indigenous communities to address these insecurities.*

Over the years, MAC and its members have worked hard to advance Indigenous relations and participation in our sector, adopting community engagement practices that go well beyond legal requirements through *TSM* and other company efforts. Building mutually-beneficial relationships with Indigenous communities both enhances economic and business opportunities for these communities, and acts as a business advantage for mining companies. With some 350 active agreements in place across Canada, this demonstrates that relationships are maturing and working. To strengthen this relationship, MAC has consistently advocated that governments should:

- Enhance foundational social investments (health, housing, water, education) that contribute to better outcomes for Indigenous peoples;
- Increase targeted funds for skills training and entrepreneurship to assist Indigenous peoples in securing opportunities generated by the industry; and
- Establish and/or improve mechanisms through which governments share a portion of the revenues generated from royalties, mining taxes and/or fees in their jurisdiction.

MAC acknowledges that most mines in Canada are located within 200 kilometres of one or more Indigenous communities, frequently in remote and northern regions, and that many of these communities are witnessing climate-related changes. As with remote mining operations, many of these communities are reliant on high-emitting and expensive diesel power generation as their primary energy source. Beyond addressing capacity, MAC also recognizes the strong synergies between industry and Indigenous communities on the need to address the energy infrastructure deficit in remote and northern regions, and has advocated for strategic investments in this space.

For example, MAC has been vocal in supporting federal commitments to reduce community reliance on diesel and continues advocating for programs that can facilitate “win-win” outcomes for industry and communities across Canada. This support is based on practical and successful examples of partnerships in this space:



- Glencore's Raglan Mine is supplying clean power to local Inuit communities.
- De Beers' power line extension at its Victor mine in Northern Ontario brought clean power to the Attawapiskat community – a positive legacy that will persist beyond the mine's closure.
- The Highway 37 transmission line extension in British Columbia brought clean power to the town of Iskut and the Red Chris mine, and facilitated the construction of a run-of-river joint venture project between AltaGas and the Tahltan First Nation.
- MAC is currently working with the Canadian Electricity Association and decision makers on a Yukon Energy Corporation proposal to augment transmission capacity to displace a developing mine's reliance on diesel – a project supported by the local community.

Without diminishing the positive role that individual mining companies will continue to play, from MAC's perspective, it is important to delineate responsibility for addressing the issue at the international, national, and community levels. MAC, as a national association mandated to advocate to the federal government on national issues and challenges, has a different and separate role to play in addressing some of these challenges than individual member companies engaging with impacted communities in question. Members of MAC are committed to meaningful and ongoing engagement with their Indigenous communities of interest, and to help these communities self-define what their priorities, goals and objectives are.

***For this Call to Action, the COI Panel recommended that MAC and MAC members:***

***3.1. Assist local and Indigenous communities by improving renewable energy production and energy storage solutions.***

MAC and its members support the deployment of renewable power generation technologies where and when they are feasible. The energy management options available to mining companies, however, are both site and regionally specific. For example, just as miners need to go where the viable deposits are located, renewable generation is contingent on the strength and reliability of the renewable asset near the mine site. This having been said, technology adaptation and adoption is changing rapidly, increasing its viability for deployment in regions and circumstances previously not thought possible. For this reason, MAC was supportive of the federal government's \$400 million commitment in Budget 2017 for an Arctic Energy Fund to help northern communities transition away from a reliance on diesel power.

MAC continues to support programs such as these to recognize and enhance the existing synergies between companies and communities, and remains in dialogue with officials on an ongoing basis in support of "win-win" outcomes.

For context, the development of a renewable energy project is an extensive undertaking and takes years to come to fruition. From determining the viability of the renewable asset, to detailed engineering studies, to permitting, construction and deployment, inception to operation typically occurs over a period of several years. Further, while mining companies have developed an expertise in aspects of energy and fuel efficiency and management, generally speaking, miners are not experts in the renewable energy space.

However, recognizing the opportunity in this space, and after taking this call to action under

advisement, MAC commits to facilitating an exploratory dialogue with the Canadian Wind Energy Association, the Canadian Solar Energy Association, our membership and the MAC COI Panel with the aim of better understanding (MAC Action #7):

- The state and trajectory of renewable technology development, permitting and deployment in the Canadian context.
- The opportunities and limitations with renewable energy production and storage technologies for mining companies.
- The opportunities for potential partnerships between MAC members and their Indigenous communities of interest, including in the areas of technology training and capacity building.

### ***Examples of MAC Members' Initiatives***

One example of a company-community partnership on renewable energy to date is the SunMine, a 1MW solar project built on Teck's former Sullivan Mine Concentrator site, which has been fully reclaimed. SunMine is community owned, distinct and well suited to capitalize on Kimberley's clear and sunny conditions. SunMine has 4,032 solar-cell modules, mounted on 96 solar trackers which follow the sun's movement, maximizing solar exposure. It is BC's largest solar project, Canada's largest solar tracking facility, and the first solar project in B.C. to sell power to the BC Hydro grid. In addition to energy generation, SunMine will benefit the regional economy through increased visibility and awareness. The engineering and project experience will garner the region a competitive edge for future initiatives in the growing renewable energy market. SunMine began commercial operation in June 2015.

While this progress will continue on the renewable energy front, it must be recognized that it will only be a solution for operations with access to a renewable asset, and site-specific assessments need to be undertaken to assess its viability versus competing energy and fuel efficiency projects.

The following example demonstrates that other types of environmental initiatives can prove just as fruitful when it comes to improving energy efficiency and reducing emissions. In 2015, after careful review of different potential projects (including wind energy), Dominion Diamond installed an in-vessel composter—the first mine in Canada's North to do so – because site-specific considerations made this investment more environmentally and economically beneficial. As a result, roughly half of organic waste generated at the Ekati mine is composted. By the end of 2016, more than 67,000 kilograms of organic waste has been diverted, reducing GHG emissions by 210 tonnes CO<sub>2</sub> equivalent and diesel consumption by 74,000 litres. Thanks to the in-vessel composter, Dominion is often able to shut down one or both waste incinerators entirely, which has decreased scrubber water consumption by an estimated 25%. More recently, in 2016, Dominion launched a study to evaluate the use of site-generated compost in reclamation work as a means of adding nutrients to the processed kimberlite and to promote vegetation growth. If the study shows positive results, it will create a new opportunity to transform site-generated waste into a powerful tool in reclamation.

### ***3.2. Build capacity among local and Indigenous businesses to maintain clean energy infrastructure at or near the mine site.***

MAC consistently advocates for increased and targeted funds for skills training and

entrepreneurship to assist Indigenous peoples in securing opportunities generated by the industry. As skilled labour is more than often transferable between different industrial applications, MAC recognizes synergies between our efforts in this space and this call to action.

Additionally, to achieve Level AAA in the *TSM Energy Use and GHG Emissions Management Protocol*, companies must demonstrate their support for community projects in this space. One example of this is Suncor Energy's investments in organizations that work to promote energy literacy and advance thinking around a low-carbon energy future. Suncor has partnered with QUEST, a collaborative network of stakeholders who are working to make Canada a leader in the design, development and implementation of Integrated Community Energy Solutions (ICES). ICES are about creating smart energy communities by linking energy across land use, buildings, transportation and other related infrastructure. Another example would be De Beers linking power to the Attawapiskat community, enabling them to be grid connected, thus displacing diesel.

MAC members understand that their involvement in such initiatives is best supplemented by other organizations with expertise in renewable technologies, including in areas such as training and capacity building. MAC sees value in exploring the incorporation of renewable energy training considerations to identify opportunities and potential areas of partnership going forward ([Related to MAC Action #7](#)).

**3.3. *Where appropriate, aid in the development of capacity for the development of energy efficient, quality and local sustainable food supplies.***

*What we heard from the COI Panel in our April 24<sup>th</sup> engagement: This recommendation was not intended to be prescriptive, but to raise awareness of a key challenge that many Indigenous communities face in general, and specifically with respect to climate change. The aim was to explore how capacity building in this space may be advanced, and explore how greater opportunities to address the issue may be leveraged.*

MAC appreciates that climate change can negatively impact community reliance on local foods, and that this challenge can exacerbate pre-existing and serious food security challenges in regions where geographic and climatic considerations already impede or prevent the production of most foods, such as Nunavut. Recognizing the scale of the challenge, several MAC members provide targeted support to help address community concerns (see below for company examples).

Fundamentally, MAC recognizes that the industry's expertise to address this complex challenge is limited. Acknowledging that this is a priority for many communities, however, MAC and member companies are willing to learn how the mining industry may be able to better support efforts in this area. Finally, MAC maintains the scale and scope of this issue requires a broad, concerted and strategic effort on behalf of numerous parties, with governments taking the primary leadership role. This view has informed MAC's advocacy to enhance capacity outcomes for Indigenous Canadians through targeted government programming and investments, such as the renewal and expansion of the Aboriginal Skills Employment & Training program and support for government resource revenue sharing policies.

Looking forward, MAC commits to exploring opportunities for joint advocacy with Indigenous and other organizations around the role that governments should play to address this issue.

MAC remains committed to working with local communities to identify unique issues and to finding practical solutions ([MAC Action #8](#)).

### ***Examples of MAC Members' Initiatives***

At Agnico Eagle's Meadowbank Mine in Nunavut, a food supply contract was awarded to a new joint venture set up between a major southern-based food distributor and the local co-op in Baker Lake. All of the food purchased for the mine is now routed through the co-op, giving it greater purchasing volumes and allowing for better pricing. This, in turn, is passed on to the community where the cost of food is very high due to the remote location. In addition, Agnico reinvests its share of the annual co-op dividend back to the co-op so that it can improve its facilities.

Similarly in the North, Avalon Advanced Materials investigated partnerships with local NWT educational institutions, southern universities, and government and local Indigenous contractors to develop an energy efficient greenhouses for the North. The aim was to permit mine sites and communities to make high quality, energy efficient and less costly food supplies. These greenhouses could then be installed across the North by the Indigenous company.

Vale Canada has been supporting a social enterprise called [Project Sucseed](#), developed by students at Memorial University in St. John's, Newfoundland and Labrador. Project Sucseed focuses on improving food security in northern and remote communities across Canada whose climates make it difficult to grow fresh produce. The students have developed a low cost and energy and water efficient technology for growing high-quality produce locally and affordably. The system uses module containers that are about the size of a typical household storage bin and a single system (one storage bin) can grow about 700 lbs of fresh produce each year at an operating cost of under \$2 per week, making it a viable alternative to importing fresh produce for northern and remote communities. Project Sucseed employs at-risk youth in the province to manufacture their product and has received funding to deploy these products to every community in northern Canada. Throughout the project's pilot stage, Vale provided in-kind support, giving Project Sucseed access to the company's air charters to move equipment and people to the community where they were testing the system. Based on the success of the pilot project, Vale is now providing financial support to help with the initiative's expansion. [Project Sucseed's video](#) explains how the program can help Canada's remote and northern communities overcome their challenges with food security.

Beyond Canada's borders, IAMGOLD has provided food support to those in need living near its Essakane Mine in Burkina Faso's Sahel region since 2008. Initially, the program focused on 1,000 vulnerable individuals, including the elderly, persons with disabilities, and women who were the heads of their households. Upon evaluating the program, however, IAMGOLD shifted the focus of its support towards households to generate longer-term benefits for both vulnerable individuals and their families. In 2015, IAMGOLD engaged community leaders and NGO, A2N, to develop poverty indicators to help identify the households that would benefit most from the support. This also informed the types of support that would be provided, with the aim of battling poverty and increasing food security over the long term. Their input led to IAMGOLD supplying 258 vulnerable households with the following supports: two goats and veterinary care for the animals, two bags of agro-industrial goods and two 100-kilogram bags of millet. IAMGOLD and the communities regularly review the program and recent data has shown that the number of vulnerable households has declined by 50%.

## COI PANEL CALL TO ACTION #4: SUPPLY CHAINS

**Rationale:** *The mining industry can play a significant role in strategically positioning itself as a supplier of minerals and metals that are critical for the transition to a low carbon future. Potential benefits associated with a global supply chain can be leveraged, with risks minimized, to yield positive economic, social and environmental change, while concurrently creating a growing market for these critical products.*

As primary materials, minerals and metals are fundamental to the transition toward a lower carbon future. As the mining industry continues to improve its environmental performance, so will its products continue to shape the world in which we live. In this sense, mining companies produce the supply chain of materials without which the technologies of tomorrow would not be possible.

Canada hosts one of the largest mining supply sectors in the world, servicing both domestic and international mining operations. In 2014, the most recent year for which data is available, materials and supplies amounted to \$7.7 billion, and was the single largest collective cost across the Canadian mining industry. Acknowledging the scale of this investment, MAC members recognize that they can be influencers across their supply chains by both raising awareness of our industry's climate change priorities, and nudging suppliers toward lower carbon services and products.

The *TSM Energy Use and GHG Emissions Management Protocol* enshrines this recognition as best practice for Indicator 1. To obtain a Level AAA rating, a facility must demonstrate that its energy use and GHG emissions management system is integrated into a broader sustainable business strategy, with the option of having its procurement and supply chain management policies incorporate energy efficiency and GHG emissions reduction criteria. To better facilitate synergies between companies and their supply chains, MAC supports the Canada Mining Innovation Council's supply chain approach further detailed below.

**For this Call to Action, the COI Panel recommended that MAC and MAC members:**

- 4.1. *Build on the work of the Canada Mining Innovation Council and use its members' purchasing power to encourage suppliers to offer cost-competitive, value-creating, low carbon emission products (e.g., low-emission electric mining equipment and energy storage technology that can meet the needs of remote operations).***

MAC views the Canada Mining Innovation Council (CMIC) as an important vehicle to drive innovation in the mining industry, and will continue to advocate for funding for CMIC as a core component of the industry's efforts to address climate change (MAC Action #9). An important component of this work is CMIC's supply chain approach, designed to ensure rapid co-development and deployment of solutions, ensuring that suppliers are focused on company needs and that solutions are developed on an industrial scale, leveraging the broadest possible benefits from limited pools of resources.

CMIC's Towards Zero Waste Mining (TZWM) innovation strategy is designed to develop lower

carbon solutions to support greater emissions reductions and productivity gains. For example, CMIC's projects in underground mining are focused on moving the industry to all-electric underground operations. The critical piece is working with suppliers to accelerate the development and deployment of these lower emission solutions. Some of the targeted benefits and focus areas include:

- Ventilation costs being reduced by up to 45%, meaning a significant reduction in power consumption (with associated emissions reductions) for this aspect of operations.
- Making battery electric vehicles (BEVs) more energy efficient to reduce wasted energy while maintaining productivity. The goal is to increase lost power by approximately 70%.

One of the significant challenges with adoption of BEV equipment is the lack of standards in this space. There are also conflicts with existing regulations, which have been designed with diesel consumption in mind. CMIC is currently leading the development of new proposed guidelines – as a precursor to developing standards.

Where technology does not exist to address identified industry priorities, CMIC is actively partnering in its development, and including suppliers directly in the broader CMIC consortia. One of the targeted benefits and focus areas include:

- A new technology for processing has the potential to reduce energy consumption in comminution (the fine grinding of solids) by up to 50%. With energy accounting for an average of 15-22% of total mine operating costs, significant innovation advances in comminution alone can yield major advances in energy efficiency, cost reduction, and emissions reduction with the use of new technologies. CMIC is working towards pilot scale development.

Beyond our continued advocacy for federal funding to enable this crucial work to progress, the Canadian mining industry undertakes significant investments in projects across the mining life-cycle. For example, in 2013 (the most recent year for which data is available), the industry invested \$677 million in innovation and research and development. Looking forward, MAC would be pleased to have CMIC engage with the COI Panel directly on this subject, to explore the full extent of current efforts being undertaken in this space, and dialogue on how further partnerships may support mutually-beneficial outcomes.

Beyond CMIC, mining industry efforts to leverage supply chains to bolster efforts in addressing climate change are already underway at the International Council of Mining and Metals (ICMM), an organization to which several MAC members belong. Initial dialogue has resulted in plans for a workshop to develop a lower-carbon roadmap for mining. This workshop will engage supply-chain partners (such as original equipment manufacturers and power providers) to explore stronger partnerships in addressing climate change.

***4.2. Strategically position the mining industry as a key source of metals for renewable energy manufacturers (e.g., copper and nickel in wind farms, and lithium and rare earth elements in electric vehicle batteries), sustainable transportation manufacturers (e.g., passenger rail and buses) and non-emission fuels (e.g., uranium).***

There is a natural synergy between mining and clean technology. Extracted raw materials are transformed into technology that, having gone full circle, assist mining operations in reducing environmental footprints and enhancing efficiency and reliability. These same products and technologies are driving performance improvements, efficiency gains, and a lower carbon footprint across society. The examples below help to underscore the essential role that mining will continue to play in the future:

### ***Power Generation:***

#### **Wind Turbines:**

- Approximately 100 tonnes of steelmaking coal is necessary to produce the steel to build the average wind turbine.
- While the amount of copper in a wind turbine will vary from model to model, it is estimated that the average 1.8 MW wind turbine contains approximately 3175 kg of copper.
- A single wind turbine generally contains 500 kg of nickel.

#### **Solar Power:**

- Most solar photovoltaic systems use silicon cells to turn the sun's rays into energy. Germanium solar cells are also in solar photovoltaic systems.
- Silver makes up 90% of a glass paste applied along the top and bottom of crystalline silicon photovoltaic cells.

#### **High-Efficiency Natural Gas:**

- Natural gas boilers come in cast-iron, steel, copper, aluminum and other materials fit-for-purpose to maximize efficiency relative to intended use.
- Upgrading a natural gas furnace or boiler from 56% to 90% efficiency in an average cold-climate house will save 1.4 tonnes of carbon dioxide emissions each year.

#### **Nuclear Power:**

- Nuclear reactors generate safe and reliable base-load electricity using small amounts of uranium and do not emit GHGs.
- The basic fuel for a nuclear power reactor is uranium. Canada is one of the world's largest uranium producers, and is a global leader in nuclear research and technology, exporting emission-free fuel to the world.
- A typical nuclear reactor uses up to 20 different nickel alloys.

### ***Transportation:***

#### **Light Rail:**

- Approximately 30,000 tonnes of steelmaking coal was required to build Vancouver's Canada Line, which accommodates approximately three million passenger trips a month.



### **Electric Cars:**

- The average electric car contains 75 kg of copper wiring – three times as much as a conventional vehicle.
- Lithium, aluminum, nickel, cadmium, cobalt and zinc are key ingredients of new and emerging battery technologies. For example, cars powered by nickel hydride batteries produce 50% less pollution and GHGs than comparable gasoline-powered vehicles.

### **Fuel and Emission Efficient Vehicles:**

- Displacing steel with aluminum and other high strength lightweight materials in the automotive, rail and aviation industries reduces total vehicle weight, enabling greater distance travelled per litre of fuel consumption, reducing net emissions.
- Platinum, palladium, rhodium and gold are used in catalytic converters to convert pollutants in exhaust gas from internal combustion engines.

Canada is a global leader in sustainable mining practices, and MAC members are among the most responsible companies operating throughout the world. Further, Canada's mining operations often rank amongst the lowest in carbon intensity when compared to their competitors. To ensure that the world is supplied with the metals and minerals needed for a low carbon society, in as low-carbon a manner as possible, it is essential that Canadian operations maintain their overall competitiveness.

When it comes to climate change policies, these realities underscore the need for appropriate protections for emissions-intensive and trade-exposed sectors, like mining. Additionally, any climate change policy needs to be sensitive to geographic circumstances, like those faced in Canada's remote and northern regions.

#### ***4.2. Assess the opportunities for mining companies and industry associations (including MAC) to work with partners and customers to recycle or reuse products containing metals and minerals.***

E-waste is one of the fastest-growing waste streams in the world and includes items such as mobile devices, computers, monitors, televisions and DVD players, among other electronic equipment. The lifespan of computers in developing countries, for example, has dropped significantly in recent years, and mobile devices frequently have a lifespan of less than two years. As consumers and businesses favour disposable technology and a shorter life-cycle for electronics, the amount of e-waste generated is increasing. Recent data indicates that more than 22 million Canadians have mobile device subscriptions, with many people replacing their devices every one to two years.

A large portion of e-waste can be recycled, components of which can be recovered as "urban ore." E-waste recycling involves reprocessing obsolete or unwanted electronics that have exhausted their re-use potential and would otherwise be disposed of in landfills.

Over a decade ago, MAC partnered with the Recycling Association of Canada and Environmental Defence to persuade Environment Canada to amend regulations facilitating the import of electronic waste from the United States for recycling at Canadian smelters. As a result of MAC's advocacy efforts, Glencore's Horne Smelter has become the world's largest processor of electronic scrap containing copper and precious metals. One of the notable

features of the Horne smelter is its ability to process a wide-range of feeds, and its capacity to process 840,000 tonnes per annum of copper and precious metal bearing materials.

Similarly, Teck's smelting facility in Trail is a major recycler of lead acid batteries from the automotive market. The smelter also has the capacity to effectively process thousands of tonnes of e-waste each year – reducing waste, preventing the deposit of metals and plastics in landfills and continuously improving the recovery of valuable materials.

#### **COI PANEL CALL TO ACTION #5: PUBLIC POLICY ENGAGEMENT**

**Rationale:** *Enhanced, strategic public and policy engagement on climate change can create additional value both broadly and specifically to the mining industry. Sharing success stories with the public can improve the social license to operate and encourage innovation both within and beyond the mining industry. In addition, proactively addressing the concerns of impacted workers and communities can help build trust and reduce risk exposure. Concurrently, actively engaging policy makers and building coalitions with other stakeholders can help shape and legitimize policy that facilitates a just transition towards de-carbonization.*

**For this Call to Action, the COI Panel recommended that MAC and MAC members:**

- 5.1. *Build on existing campaigns by MAC and other industry associations to educate Canadians on existing success stories and the role of the mining industry in supplying the metals and minerals needed to de-carbonize our energy and transportation systems.***

Sharing MAC members' innovative initiatives in this space with government and the Canadian public has been a top priority for MAC's communications programming with government and the Canadian public, and are regularly featured in our publications, presentations, speeches and campaigns.

Since 2011, MAC has produced [advertising and digital campaigns](#) connecting minerals and metals to modern and contemporary products that Canadians use in their daily life. Since 2015, MAC's campaigns have amplified the connection between mining products to low carbon and renewable technologies, which has generated considerable interest amongst government, other organizations and educators – many of which have requested copies of the ads to promote them within their own networks.

MAC will continue its efforts in this area to contribute to our stakeholders' and the wider public's understanding of the industry's actions to address climate change and to protect the environment, as well as highlight the industry's role in providing the raw materials needed for a lower carbon future (**MAC Action #10**).

- 5.2. *Enhance advocacy for public policies that stimulate demand for low-carbon infrastructure, and put a price on carbon that reflects the social costs of climate change while remaining competitive on the international stage – MAC's recent Principles for Climate Change Policy Design offer an excellent example of this approach, and we encourage more such work by MAC and MAC members.***

To assist government in the development of an effective pan-Canadian climate change plan, MAC released [\*Principles for Climate Change Policy Design\*](#) in April 2016. In that document, in addition to supporting a revenue neutral price on carbon, MAC underscored the need for any climate change policy to ensure the competitiveness of emission-intensive and trade-exposed (EITE) sectors, as well as the necessity of being sensitive to the geographical realities of remote and northern regions. Our principles explicitly called for carbon revenue to help 'exposed' economic sectors and populations adapt to the costs associated with a carbon-limited future.

Building on these principles, MAC has been advocating for government support of the Canada Mining Innovation Council (CMIC)'s Towards Zero Waste Mining (TZWM) innovation strategy (Related to MAC Action #9). As mentioned above, TZWM is designed to support the development and adoption of lower carbon solutions, such as battery-powered underground equipment, to facilitate greater emissions reductions and productivity gains across mining processes. Further, MAC is advocating for a program that would support broader deployment of energy and fuel efficiency projects, and renewable wind generation and energy storage technology package for off-grid operations based on the Raglan Mine's successful pilot project.

Whether enhancing the reliability of renewable generation, increasing the efficiency and applications of diesel and natural gas, or through myriad site-specific process efficiencies, MAC supports strategic government investments to accelerate industry investments as companies work to improve energy, fuel and process efficiency at the mine site.

**5.3. *Align with other interested organizations to seek common goals for climate action. This model – long proven successful on other social and environmental issues facing Canada's mining industry (e.g., the Whitehorse Mining Initiative, the Resource Revenue Transparency Working Group, the Devonshire Initiative, the National Orphaned and Abandoned Mines Initiative and MAC's Community of Interest Panel) – should now be adopted to focus on the impacts of, and opportunities for, the mining industry with respect to climate change.***

In response to this call to action, and following the release of our *Principles for Climate Change Policy Design*, MAC has proactively participated in joint public statements, media engagements, and energy and climate-related conferences and forums alongside NGOs, coalitions and other business groups.

Our contributions have communicated our members' commitment to addressing climate change, opportunities for the development and adoption of low emission technologies, and the need for good public policy to achieve intended outcomes. Specifically, this includes the need to protect EITE sectors, for policy to be sensitive to remote and northern regions, and for government to invest in industry's innovation efforts. MAC will continue to assess opportunities for strategic partnerships in this space, and work constructively with individuals and organizations that are working toward common objectives.

**5.4. Advocate for industry and government-supported transition funds for impacted workers (i.e., those workers who face increasingly precarious employment, underemployment, or unemployment) and communities dependent on companies adversely impacted by climate change mitigation policies.**

What we heard from the COI Panel in our April 24<sup>th</sup> engagement: The COI Panel communicated concern that too often workers and unions have felt turned against climate policy due to concerns that potential job losses may result from reduced industrial competitiveness. Panel members emphasized their view that specific regional and industry-specific transition plans are required, and that unions and the workforce must be engaged at early stages. The Panel also recognized that governments have a primary responsibility in funding transitional programs, but that industry is well positioned to recognize and support the need for this transitional support.

The mining industry directly employs more than 373,000 workers across the country in mineral extraction, smelting, fabrication and manufacturing, and indirectly employs an additional 190,000 workers. Proportionally, the mining industry is also the largest private sector employer of Aboriginal people in Canada and employment is poised to increase.

Acknowledging that mining industry is an emissions-intensive and trade-exposed sector, MAC has consistently advocated for climate change policy that leads to meaningful emissions reductions while protecting Canadian business competitiveness. In this respect, MAC sees some consistency with the views expressed by the COI Panel in this call to action. Further, MAC recognizes the potential for partnership with unions in working with decision makers to ensure that shared concerns are well understood prior to policy determinations being made.

As a first step in this space, and in direct response to the Panel's recommendation, MAC will review the "[Getting It Right](#)" report, a union-prepared document that shares experience-based learnings on transition planning as derived from the Province of Alberta's decision to phase-out coal-fired electricity generation. Following this review, MAC commits to engaging with unions in dialogue on what shape a shared engagement in this space might look like, as well as consider pathways forward ([MAC Action #11](#)).

**5.5. Acknowledge the need for policies in support of impacted workers (in the mining sector and beyond), including re-training for new job opportunities, employment insurance flexibility for worker transitions, enhanced severance and salary continuance, pension bridging and early retirement options.**

Consistent with recommendation 5.4, MAC will review the "Getting It Right" report, and commits to engaging with unions in dialogue on what shape a shared engagement might look like and potential pathways forward to address the above concerns ([Related to MAC Action #11](#)).

## COI PANEL CALL TO ACTION #6: DISCLOSURE OF CLIMATE RISKS AND OPPORTUNITIES

**Rationale:** *Increasing numbers of long-term oriented institutional investors are encouraging mining companies to continue developing meaningful disclosure of climate change-related risks and opportunities. When assessing any type of emerging risk (such as climate change), the key to beginning to understand the possible impacts lies in the availability of pertinent and accurate information which the mining sector strives to provide.*

The disclosure practices of public companies in relation to climate-related risks and financial impacts have attracted significant international attention in recent years. MAC recognizes that investors and regulators are seeking information in this space, which the mining industry is well positioned to provide.

**For this Call to Action, the COI Panel recommended that MAC and MAC members:**

- 6.1. Continue to disclose absolute GHG emission levels and relevant corresponding metrics, while promoting consistent international standards to ensure accuracy.**

Transparency is a core value of TSM, and good practice for the Indicator 2 of the *TSM Energy Use and GHG Emissions Management Protocol*. This indicator requires members to have a comprehensive management system in place, and reporting on emissions data is required to achieve a Level A. MAC also collects energy and emissions data from its members and publishes it on our [website](#), and many members use this mechanism as a means to address this requirement.

Amongst other requirements of the protocol, energy data must be collected, reviewed regularly and integrated into operator actions for energy intensive processes. Further, many MAC members submit GHG inventories to provincial, territorial and federal regulators, to the CDP (previously the Carbon Disclosure Project), and Global Reporting Initiative Standards.

With respect to emissions reporting in the pan-Canadian context, any proposed regime should be harmonized across jurisdictions with a consistent approach to monitoring, verification, reporting and administration. MAC supports and will continue to advocate for a “one-window” approach, which would reduce regulatory and administrative burden (**MAC Action #12**). MAC encourages members of the COI Panel to support industry with respect to regime compliance.

- 6.2. Where possible, clearly segment categories of capital expenditures and research development expenses to effectively disclose risks and opportunities. For example, although difficult to provide, disclosing distinctions on capital expenditures between continuing operations, new projects and climate adaptation requirements would provide critically useful information.**

*What we heard from the COI Panel in our April 24<sup>th</sup> engagement:* *The investment community is trying to develop tools that enable them to make risk assessments resulting from*

*vulnerabilities, one of which is climate change. While the role of government is to put a clear carbon pricing mechanism in place to enable quantitative pricing certainty, a greater appreciation of the qualitative side of risk management and industry practices is also needed.*

MAC members support transparent business practices, including with respect to climate change risk disclosure. Climate change-related information, including carbon cost forecasts, has been published in individual companies' annual sustainability reports. Beyond legal and regulatory requirements, our members also disclose significant information through their *TSM* commitments. That having been said, MAC recognizes that determining the specific information sets required to enable appropriate risk assessments has been and continues to be an iterative process, with different reporting programs having inconsistent reporting requirements. Acknowledging this, and in light of this recommendation, MAC commits to working with the COI Panel to identify key financial sector representatives with the aim of hosting a workshop. The objective of the workshop will be to explore pathways toward achieving a suitable, singular, streamlined and comprehensive climate change risk disclosure approach (**MAC Action #13**).

**6.3. Continue to further enhance material disclosure (beyond current regulatory requirements) of climate change risks and opportunities (based on qualitative and quantitative information) to investors and other stakeholders seeking to assess the long-term strategic resilience of mining companies.**

As articulated in the response above, MAC members support transparent business practices, and frequently publicly disclose climate-change related information through their annual reports and through their participation in *TSM*. For example, good practice for Indicator 2 of the *TSM Energy Use and GHG Emissions Management Protocol* requires:

- Metrics that are clearly defined, consistently applied, and reported routinely to facility senior management to inform decision making.
- Annual public reporting of energy use and GHG emissions.
- Where offsets are used by the facility or business unit to meet commitments, public reporting includes:
  - the amount of offsets as a percentage of total emissions generated at the facility and/or at the business unit level; and
  - the source and nature of the accreditation of offsets.

Over the past year, MAC has been monitoring the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD). We believe that the final recommendations are likely to establish a precedent for disclosures on climate change risks and opportunities.

Stemming from the recommendations of the TCFD, the Canadian Securities Administrators announced a project to review the disclosure of risks and financial impacts associated with climate change. The project will gather information on the current state of climate change disclosure in Canada and internationally, and will include consultation with investors and reporting issuers. MAC members are well positioned to engage in this process. Further, MAC also views our commitment to action 6.2 to be complementary to this recommendation (**Related to MAC Action #13**).



## APPENDIX A

# **RIISING TO THE CHALLENGE: ADVISORY STATEMENT ON CLIMATE CHANGE ISSUED TO MAC & MAC MEMBERS**

**November 4, 2016**

### **PURPOSE**

The Community of Interest Advisory Panel (the “**Panel**”) of the Mining Association of Canada (“**MAC**”), in fulfillment of its terms of reference, strives to:

- ❖ advise and encourage improvements in social, environmental and economic performance of the Canadian mining industry; and
- ❖ identify to the MAC Board of Directors current and emerging priority issues (environmental, social/cultural and economic) for the sector for the purposes of strategic planning.

To this end and consistent with its mandated responsibility, the Panel is pleased to present the following *Advisory Statement on Climate Change* to MAC and its members. This Advisory Statement is intended to build and expand on MAC’s recently released [\*Principles for Climate Change Policy Design\*](#).

### **INTRODUCTION**

Climate change is a global concern. Its impacts pose increasingly widespread threats to local and Indigenous communities, vulnerable ecosystems, economic activities (including mining) and the security of nations. The adoption of measures to address climate change, mitigate its effects and strengthen the resilience of ecosystems has the potential to alleviate long-term impacts, minimize necessary future modification costs, and create social and economic benefits for both public and private interests – be they local, regional, national or international in focus.

Recent commitments by the Canadian federal government and international community, including the United Nations’ *Paris Agreement*, are triggering innovative policies and activities focused on addressing climate change and mitigating its impacts. The Panel challenges and strongly urges MAC and its members to continue to lead and innovate in:

- ❖ reducing emissions;
- ❖ engaging with local Indigenous interests, rights-holders and stakeholders;
- ❖ actively pursuing effective means to mitigate climate change impacts;
- ❖ focusing efforts on achieving a just transition and proper adaptation for long-term resilience; and



- ❖ challenging supply chain partners and investors to support these efforts.

To that purpose, the Panel proposes specific ideas and actions herein to assist MAC and its members in building on the progress already made in addressing climate change, and to help guide future endeavours with respect to planning, managing and operating mines and related activities in this changing global context.

## **CALLS TO ACTION**

### ***1. Towards Sustainable Mining Program***

**Rationale:** MAC's Towards Sustainable Mining Program ("**TSM**") is focused on continual improvement that is credible and responsive to the expectations of communities of interest. The ongoing development of TSM provides opportunities to go beyond existing efforts, and expand its focus on climate change in such a manner that the urgency of the current situation, the increasingly stringent government reporting requirements, and the opportunities afforded to demonstrate pro-active leadership in addressing climate change can be taken into account.

Accordingly, the Panel recommends that MAC and MAC members:

- In the course of implementing MAC's strategic priorities, systematically review TSM, including all TSM documents (i.e., guiding principles, protocols, frameworks and guides), to explicitly integrate consideration and references to climate change, including mitigation and adaptation and resiliency measures;
- In TSM guides, include reference lists to appropriate tools for climate risk assessment and disclosure;
- Strengthen expectations of MAC members regarding climate change to meet at least the Level A requirements in the Energy Use and GHG Emissions Management Protocol, especially around performance. Additionally, consider making current requirements for Level AAA in the Protocol, such as going beyond energy efficiency and savings and reporting scope 3 emissions, necessary to obtain a Level AA rating. An enhanced Level AAA rating could include extra measures such as demonstrated implementation of the MAC *Principles for Climate Change Policy Design*, mandatory climate risk disclosure and required educational and training initiatives on emission reductions;
- As TSM evolves, include appropriate climate-related terms, definitions and criteria in all other Protocols, especially Biodiversity Conservation Management, Tailings Management, Crisis Management, and Water (once approved); and
- Add climate change considerations, terms and requirements into the Frameworks around Aboriginal and Community Outreach, Safety and Health, Mine Closure, and Energy Use and GHG Emissions Management.

### ***2. Operations Level***

**Rationale:** The mine site, processing plants (i.e., mills) and smelters have historically been a focus for emission mitigation and energy efficiency activities. While efficiency improvements have already led to significant emission reductions, operational-level actions centred on

continuous improvement should remain an important focus for additional action on climate change.

Accordingly, the Panel recommends that MAC and MAC members:

- Actively implement and incorporate the use of cost-competitive, value-creating, low carbon emission energy production and energy storage technologies in mine-site operations (i.e., expand the use of these technologies beyond demonstration projects, where feasible);
- Conduct climate change risk assessments that consider direct and indirect risks – such as receding permafrost, increasing frequency and severity of droughts, floods, snow falls and wildfires – at all stages of mine-site design and planning;
- Implement appropriate adaptation measures based on risk assessments that also account for the considerable uncertainty in modelling climate change risks; and
- Engage, educate and empower mine-site workers to consider potential climate change risks and creative solutions.

### **3. Local and Indigenous Communities**

**Rationale:** Local, remote and/or Indigenous communities often experience the earliest and most severe impacts from climate change. Concurrently, energy costs are often high, energy use often relies on high emission sources, and energy sources are often unreliable. This presents an important opportunity for MAC and MAC members to work with government, industry, and local and Indigenous communities to address these insecurities.

Accordingly, the Panel recommends that MAC and MAC members:

- Assist local and Indigenous communities by improving renewable energy production and energy storage solutions;
- Build capacity among local and Indigenous businesses to maintain clean energy infrastructure at or near the mine site; and
- Where appropriate, aid in the development of capacity for the development of energy efficient quality local sustainable food supplies.

### **4. Supply Chains**

**Rationale:** The mining industry can play a significant role in strategically positioning itself as a supplier of minerals and metals that are critical for the transition to a low carbon future. Potential benefits associated with a global supply chain can be leveraged, with risks minimized, to yield positive economic, social and environmental change, while concurrently creating a growing market for these critical products.

Accordingly, the Panel recommends that MAC and MAC members:

- Build on the work of the Canada Mining Innovation Council and use its members' purchasing power to encourage suppliers to offer cost-competitive, value-creating, low

carbon emission products (e.g., low-emission electric mining equipment and energy storage technology that can meet the needs of remote operations);

- Strategically position the mining industry as a key source of metals for renewable energy manufacturers (e.g., copper and nickel in wind farms, and lithium and rare earth elements in electric vehicle batteries), sustainable transportation manufacturers (e.g., passenger rail and buses) and non-emission fuels (e.g., uranium); and
- Assess the opportunities for mining companies and industry associations (including MAC) to work with partners and customers to recycle or reuse products containing metals and minerals.

## **5. Public and Policy Engagement**

**Rationale:** Enhanced, strategic public and policy engagement on climate change can create additional value both broadly and specifically to the mining industry. Sharing success stories with the public can improve the social license to operate and encourage innovation both within and beyond the mining industry. In addition, proactively addressing the concerns of impacted workers and communities can help build trust and reduce risk exposure. Concurrently, actively engaging policy makers and building coalitions with other stakeholders can help shape and legitimize policy that facilitates a just transition towards de-carbonization.

Accordingly, the Panel recommends that MAC and MAC members:

- Build on existing campaigns by MAC and other industry associations to educate Canadians on existing success stories and the role of the mining industry in supplying the metals and minerals needed to de-carbonize our energy and transportation systems;
- Enhance advocacy for public policies that stimulate demand for low-carbon infrastructure, and put a price on carbon that reflects the social costs of climate change while remaining competitive on the international stage – MAC's recent *Principles for Climate Change Policy Design* offer an excellent example of this approach, and we encourage more such work by MAC and MAC members;
- Align with other interested organizations to seek common goals for climate action. This model –long proven successful on other social and environmental issues facing Canada's mining industry (e.g., the Whitehorse Mining Initiative, the Resource Revenue Transparency Working Group, the Devonshire Initiative, the National Orphaned and Abandoned Mines Initiative and MAC's Community of Interest Panel) – should now be adopted to focus on the impacts of, and opportunities for, the mining industry with respect to climate change;
- Advocate for industry and government-supported transition funds for impacted workers (i.e., those workers who face increasingly precarious employment, underemployment, or unemployment) and communities dependent on companies adversely impacted by climate change mitigation policies; and
- Acknowledge the need for policies in support of impacted workers (in the mining sector and beyond), including re-training for new job opportunities, employment insurance flexibility for worker transitions, enhanced severance and salary continuance, pension bridging and early retirement options.

## **6. Disclosure of Climate Risks and Opportunities**

**Rationale:** Increasing numbers of long-term oriented institutional investors are encouraging mining companies to continue developing meaningful disclosure of climate change-related risks and opportunities. When assessing any type of emerging risk (such as climate change), the key to beginning to understand the possible impacts lies in the availability of pertinent and accurate information which the mining sector strives to provide.

Accordingly, the Panel recommends that MAC and MAC members:

- Continue to disclose absolute GHG emission levels and relevant corresponding metrics, while promoting consistent international standards to ensure accuracy;
- Where possible, clearly segment categories of capital expenditures and research development expenses to effectively disclose risks and opportunities. For example, although difficult to provide, disclosing distinctions on capital expenditures between continuing operations, new projects and climate adaptation requirements would provide critically useful information; and
- Continue to further enhance material disclosure (beyond current regulatory requirements) of climate change risks and opportunities (based on qualitative and quantitative information) to investors and other stakeholders seeking to assess the long-term strategic resilience of mining companies.

### **What is the Community of Interest Panel of the Mining Association of Canada?**

The Community of Interest Panel was created in 2004, alongside the Towards Sustainable Mining (TSM) initiative. The Panel is an independent, multi-interest group comprising individuals from Aboriginal groups, communities where the mining industry is active, environmental and social NGOs, and labour and financial organizations.

The Panel serves as platform for communities of interest and MAC members to discuss and collaborate on issues of mutual concern. A key role of the Panel is to provide advice on current and emerging priority issues and to encourage member companies to improve social, environmental and economic performance.

More information about the Panel can be found on the Mining Association of Canada's website: [www.mining.ca/tsm](http://www.mining.ca/tsm).

## APPENDIX B

### **MAC MEMBER ENERGY AND COMMUNITY SUPPORT PROJECTS**

The Mining Association of Canada (MAC) and its members are committed to ongoing improvement and are continually innovating to protect the environment, improve their energy use and reduce greenhouse gas (GHG) emissions. Over the past two decades, MAC's member companies have improved energy efficiency and reduced emissions at their operations through measures such as MAC's mandatory *Towards Sustainable Mining*<sup>®</sup> (TSM<sup>®</sup>) initiative and through innovations at the mine-site level.

Beyond energy, fuel and process efficiency, member companies are also engaged in numerous projects with local communities that relate to climate change, either directly or indirectly. Examples include projects on issues such as food and energy security. The below is a broad sample of MAC member projects that support addressing climate change and its impacts:

- The Glencore Raglan Mine's three-megawatt wind turbine is integrated with an energy storage network using an energy management system, the first of its kind in the world. With this [wind power project](#), the Raglan Mine is expected to save approximately 2.4 million litres of diesel and more than 6,000 tonnes of CO<sub>2</sub>e annually over the next two decades.
- Rio Tinto's [wind farm](#) at the remote Diavik Diamond Mine in the Northwest Territories, the first large-scale wind farm in the territory, has reduced the operation's diesel consumption by 10% annually.
- Stornoway's off-grid diamond mine deployed [natural gas from the outset of production](#), which has demonstrated the increasing viability of natural gas as a substitute for high-emitting diesel fuel.
- ArcelorMittal has launched pilot project to displace Bunker C heavy fuel oil with natural gas in Sept-Îles.
- Agnico Eagle has reduced diesel consumption at its Meadowbank Gold Mine in Nunavut through process innovation.
- At the project development stage, Avalon Advanced Materials has successfully reduced energy use and GHG generation well in advance of construction activities through adopting a hybrid solar-diesel power generation system..
- A number of Teck's coal mines have increased their use of [natural gas in the place of coal](#) over the last decade, reducing more than 250,000 tonnes of CO<sub>2</sub>e annually.
- Goldcorp recently achieved [significant energy consumption and emissions reductions](#) at its Musselwhite Mine, while simultaneously reducing energy costs, through peak load management and technology deployment.
- In 2009, Vale deployed an improved ventilation management system. When initially commissioned and allowed to operate for a one week period, the savings reached 39% and is expected to lead to savings of 35% over the long term.

- Barrick's Hemlo Mine was recognized by Natural Resources Canada for its innovative [ventilation management program](#) that reduced GHG emissions by 24% and lowered energy consumption by 10% between 2013 and 2015.
- In 2014, New Gold's New Afton Mine became the first mine in North America to achieve ISO 50001 certification. This [video](#) describes the benefits New Gold has achieved through its ISO 50001 certification and through its participation in MAC's TSM program.
- Hudbay Minerals has made significant energy, fuel and process efficiency improvements at its Manitoba mines, including adopting ventilation-on-demand and reducing propane consumption for underground heating.
- Dominion Diamond Corporation installed an in-vessel composter at the Ekati Diamond Mine in the Northwest Territories—the first mine in Canada's North to do so. By the end of 2016, more than 67,000 kilograms of organic waste has been diverted, reducing GHG emissions by 210 tonnes CO<sub>2</sub> equivalent and diesel consumption by 74,000 litres. This project was recognized with the [2017 TSM Environmental Excellence Award](#).
- Agnico Eagle's Meadowbank Mine in Western Nunavut supports a new joint venture set up between a major southern-based food distributor and the local co-op in Baker Lake. All of the food purchased for the mine is now routed through the co-op, giving it greater purchasing volumes and allowing for better pricing. This, in turn, is passed on to the community where the cost of food is very high due to the remote location. Additionally, Agnico reinvests its annual co-op dividend back to the co-op so that it can improve its facilities.
- In the arid climate of Burkina Faso, IAMGOLD supports the vulnerable households in the community near its Essakane Mine with the following supports: two goats and veterinary care for the animals, two bags of agro-industrial goods and two 100-kilogram bags of millet. This program involves the close participation of a local NGO, which assisted in identifying the food supports that would generate the longest-term benefits for these families and continues to review the program's success. Recent data has shown that the number of vulnerable households has declined by 50% thanks to the initiative. This project was a [finalist for the 2017 TSM Community Engagement Excellence Award](#).
- Vale Canada has been supporting a social enterprise called [Project Sucseed](#), developed by students at Memorial University in St. John's, Newfoundland and Labrador. Project Sucseed focuses on improving food security in northern and remote communities across Canada whose climates make it difficult to grow fresh produce. The students have developed a low cost and energy and water efficient technology for growing high-quality produce locally and affordably. [Project Sucseed's video](#) explains how the program can help Canada's remote and northern communities overcome their challenges with food security.