TSM

TOWARDS SUSTAINABLE MINING

Climate Change Protocol

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

TSM ASSESSMENT PROTOCOL

A Tool for Assessing Climate Change Performance

Purpose

The purpose of this TSM protocol is to facilitate continual performance improvements in the mining sector related to the management of climate-related risks and opportunities, including associated mitigation and adaptation strategies, target-setting and reporting. Implementation of this protocol is intended to support companies, at both the corporate and facility levels, in advancing the goals of the Paris Agreement.[1] The Paris Agreement aims to strengthen the global response to the threat of climate change by keeping a global temperature rise this century at well below 2°C above pre-industrial levels and by pursuing efforts to limit the temperature increase even further to 1.5°C. This protocol is also intended to align with the Recommendations of the Task Force on Climate-related Financial Disclosures,[2] which aim to improve the ability to appropriately assess and price climate-related risk and opportunities.

Performance Indicators

To assess performance and measure progress towards achieving this purpose, the Climate Change Protocol specifies criteria associated with three indicators:

1. Corporate climate change management
2. Facility climate change management
3. Facility performance targets and reporting

As with any performance assessment tool, professional judgment is required in assessing alignment with each indicator and associated criteria. Application of this protocol will therefore require a level of expertise in auditing, systems assessment, energy and greenhouse gas (GHG) emissions management, physical climate impact management and climate change adaptation, as well as relevant regulatory regimes and requirements. This protocol is a tool to assess the level of implementation of climate change management practices in support of the TSM initiative. It is not, of itself, a guarantee of the effectiveness of climate change management activities, but is intended to create the awareness, practice and corporate culture needed to achieve success in this area.

[1] **United Nations. 2015. *Paris Agreement*.**
https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

[2] **Task Force on Climate-Related Financial Disclosures. 2017. *Recommendations of the Task Force on Climate-Related Financial Disclosures.* https://www.fsb-tcfd.org/publications/final-recommendations-report/**

Indicator 1: Corporate Climate Change Management

Purpose

To confirm that commitments, governance and processes are in place at the board and management levels to support the consideration of climate change implications in business strategy. This indicator is to be completed at the corporate level.

Corporate Climate Change Management: Assessment Criteria

Level	Criteria
C	The company does not meet all Level B criteria.
B	1. A corporate action plan has been developed to meet all requirements for a Level A. 2. Data on Scope 1 and 2 GHG emissions is maintained.
A	1. There is a demonstrated corporate climate change strategy that is supported by defined actions, including integration of the strategy into business planning for existing activities and in considerations for new projects. 2. Board and management structures, accountabilities, responsibilities and reporting processes related to the governance of climate-related risks and opportunities are in place. 3. Material climate-related risks and opportunities and their impact on the company's businesses, strategy and financial planning are identified, assessed and managed. 4. Materials demonstrating the above criteria are publicly reported on an annual basis.
AA	1. There is a demonstrated corporate commitment to climate action that is consistent with the ambition to limit global warming to well below 2°C (above pre-industrial levels), with short- and long-term targets and actions planned to achieve these commitments. 2. Performance is measured against stated targets in Level AA Criterion #1. 3. Processes for identifying, assessing and managing material climate-related risks and opportunities are integrated into the company's risk management approach. 4. The resilience of the business strategy has been considered, taking into consideration different climate-related scenarios, including high- and low-warming scenarios. 5. The impacts of material climate-related risks and opportunities identified on additional aspects of business and strategy are identified, assessed and managed. 6. There is a demonstrated understanding of how the company's strategic investments contribute to societal climate change resiliency and the low carbon economy. 7. Procurement and supply chain management practices demonstrate alignment with the corporate climate change strategy.

	8. The corporate climate change strategy includes at least two of the following elements: a. Planned or actual investments in climate action (e.g., research and development, energy performance improvements, clean energy projects) that will lead to measurable improvements in climate change mitigation or adaptation. b. Key performance indicators related to the implementation of the climate change strategy assigned to relevant corporate employees, with tracking on at least a quarterly basis c. A range of potential carbon price scenarios used when developing strategies or evaluating and making decisions on projects d. Opportunities for offsets that benefit communities of interest evaluated and, where feasible, prioritized 9. Materials demonstrating the above criteria are publicly reported on an annual basis.
AAA	1. The corporate climate change strategy includes all of the elements outlined in Level AA Criterion #8. 2. There are demonstrated corporate commitments: a. Corresponding with societal ambitions to achieve net-zero emissions by 2050, with short- and long-term targets and actions planned to achieve these commitments. b. That future major capital allocation decisions will consider alignment with societal ambitions to achieve net-zero emissions by 2050. c. To contribute to Scope 3 GHG emissions reductions. 3. Short- and long-term actions to achieve stated targets in Level AA Criterion #1 and Level AAA Criterion #2(a) have been, or are on track to be, met on the timescale identified, or corrective actions have been identified and are being implemented. 4. In jurisdictions without a carbon pricing regime, the company applies an internal carbon price in standard financial analyses. 5. Materials demonstrating the above criteria are publicly reported on an annual basis.

FAQs: Corporate Climate Change Management

#	FAQ
1	What are Scope 1, Scope 2 and Scope 3 GHG emissions?
2	What are material climate-related risks and opportunities?

3	What types of commitments can be made at the corporate level with regards to climate change?
4	What is a carbon offset?
5	What are net-zero emissions?
6	Can corporate disclosures meet criteria for facility-level reporting?
7	What types of commitments can be made to contribute to Scope 3 GHG emissions reductions?
8	What constitute 'additional aspects of business and strategy'?
9	In companies where procurement is not managed at the corporate level, can facility procurement and supply chain practices be used to demonstrate alignment with the corporate climate change strategy?
10	What is an internal carbon price?
11	What types of guidance exist for corporate climate-related disclosures?
12	What types of guidance exist to support the assessment of the climate-related resilience of a business strategy?
13	How can a company conduct a good scenario analysis?
14	In cases of mergers or acquisitions, how should companies adapt their climate change strategies and commitments?
15	How can a company demonstrate an understanding of how the commodities and products in which it invests or that it uses contribute to societal climate change resiliency and the low carbon economy?
16	How can corporate GHG reduction commitments align with the commitment to limit global warming to well below 2°C (above pre-industrial levels)?
17	How can companies apply carbon price scenarios in strategic development and decision-making processes?
18	What types of strategic investments could contribute to societal climate change resiliency and the low carbon economy?

Indicator 2: Facility Climate Change Management

Purpose

To confirm that systems are in place at the facility level to manage energy, GHG emissions,

physical climate impacts and adaptation. This indicator is supported by MAC's *Guide on Climate Change Adaptation for the Mining Sector*.

Facility Climate Change Management: Assessment Criteria

Level	Criteria
C	The facility does not meet all Level B criteria.
B	1. A basic energy use and GHG emissions management system has been established that includes: a. A demonstrated senior management commitment to manage energy use and GHG emissions, with assigned responsibility to a department or individual at the facility level. b. Identification and disaggregation of significant sources of energy consumption and GHG emissions. c. Identification and estimation of significant sources of non-energy GHG emissions. 2. The facility has conducted some analyses related to physical climate impacts and adaptation. 3. The facility has developed an action plan to meet all requirements for a Level A.
A	1. An energy and GHG emissions management system is established that includes: a. A data collection and monitoring process that is appropriate for the energy use and GHG emission sources on site. b. Clear definition of roles and responsibilities for managing energy and GHG emissions performance. c. Operator awareness and understanding of parameters influencing energy performance and operator actions to optimize system energy performance for significant energy uses or GHG emission sources. d. Consideration of energy and GHG emissions in business planning, including design criteria, where appropriate. e. An annual management review. 2. A process for the management of physical climate impacts and adaptation is established that includes: a. Assessment and identification of potential physical climate impacts, with a review of this analysis scheduled at predetermined intervals. b. Consideration of risks resulting from potential physical climate impacts in relevant facility-level decision-making. c. Identification, prioritization and implementation through business planning

	of adaptation measures that respond to the identified physical climate impacts. 3. A process is in place to promote awareness of climate change mitigation and adaptation, including relevant corporate commitments and facility-level targets, to employees and contractors. 4. The facility gauges the level of importance of climate change mitigation and adaptation in relation to relevant or affected communities of interest (COI) and engages as appropriate.
AA	1. The facility collaborates with COI interested in climate change as appropriate. 2. The energy and GHG emissions management system has undergone an internal or external audit.
AAA	1. The facility applies three or more of the following leading practices: a. Key performance indicators related to the reduction of energy use or GHG emissions are assigned to relevant employees. b. Offsets are integrated into the management system. c. The energy and GHG emissions management system is applied to the full lifecycle of facility activities, including in relation to suppliers, customers and other third parties. d. Active partnership is pursued with other organizations or COI on physical climate impacts and adaptation management, with roles and responsibilities assigned to support this commitment. e. Community, cultural or traditional knowledge is considered in climate impact assessments and in the design of adaptation measures.

FAQs: Facility Climate Change Management

#	FAQ
19	What is an annual management review?
20	What are communities of interest (COI)?
21	How can facilities engage or collaborate with COI on climate change management?
22	What is an “internal or external audit”?
23	What are examples of non-energy GHG emissions?
24	What is independent assurance?

25	How long is an audit or independent assurance valid?
26	Can regional assessments be used to identify potential physical climate impacts at the facility level?
27	How can a facility demonstrate efforts to engage with COI on climate change mitigation and adaptation?
28	How can a facility consider the level of risk associated with a potential physical climate impact in the identification of adaptation measures?
29	What types of climate scenarios should be used in a facility's assessment of its physical climate vulnerabilities and risks?

Indicator 3: Facility Performance Targets and Reporting

Purpose

To confirm that energy and GHG emissions performance targets have been established at the facility level and that annual public reporting takes place on energy, GHG emissions, potential physical climate impacts, and adaptation measures.

Facility Performance Targets: Assessment Criteria

Level	Criteria
C	The company does not meet all Level B criteria.
B	1. Energy and/or GHG emissions performance targets have been set. 2. Some public reporting takes place on energy and/or GHG emissions. 3. Standard quantification and estimation methodologies are used to convert energy and GHG emissions data into comparable units, including process emissions data. 4. The company has developed an action plan to meet all requirements for a Level A.
A	1. Performance targets have been set focused on Scope 1 and 2 GHG emissions. 2. A facility-level action plan is developed and implemented that includes clear short- and long-term steps towards achievement of the performance targets. 3. Progress is demonstrated towards the performance targets. 4. Annual public reporting includes: a. Metrics and targets used to assess performance focused on Scope 1 and 2 GHG emissions. b. Where offsets are used to meet targets, a calculation of offsets as a percentage of total emissions generated at the facility and the source and the nature of the accreditation of the offsets. 5. Information on the facility's assessment of potential physical climate impacts and plans or actions to manage the associated risks is shared publicly and updated as assessments or plans are updated.
AA	a. Performance targets have been met on the timescale identified, or corrective actions have been identified and are being implemented. b. Energy use and Scope 1 and 2 GHG emissions (e.g., source data,

	conversion factors, energy GHG intensities used, etc.) have been independently assured. c. The facility seeks feedback on public reporting as appropriate.
AAA	1. Substantial transformation of the energy and GHG emissions profile of the facility has taken place, evidenced by the results of process-improvement techniques and technologies or other forms of GHG reductions or offsets, in line with a long-term net-zero emissions commitment. 2. Public reporting, including material Scope 3 GHG emissions data, is independently assured for accuracy.

FAQs: Facility Performance Targets and Reporting

#	FAQ
5	What are net zero emissions?
6	Can corporate disclosures meet criteria for facility-level reporting?
24	What is independent assurance?
25	How long is an audit or independent assurance valid?
30	Can offsets be used to meet emissions reduction performance targets?
31	Do targets need to apply to the entire facility?
32	Can a facility with distinctly different production processes set separate energy and GHG emissions performance targets?
33	Where regulation mandates a specific performance target for a facility, can this target be used for the purposes of Indicator 3?
34	What type of information on physical climate impacts needs to be publicly reported?
35	What are material Scope 3 GHG emissions and how can they be calculated?
36	What types of targets can be used to assess performance on energy related to Scope 1 and 2 GHG emissions?
37	How can a facility that is not in full operation set an appropriate performance target?
38	What should be considered when setting a performance target?

39	How can a facility demonstrate progress towards energy and GHG emissions performance targets?
40	What methodology can be used to create a practical target for mines being developed and operated at greater depths?

Appendix 1: Frequently Asked Questions

1. What are Scope 1, Scope 2 and Scope 3 GHG emissions?

Scope 1 emissions are the total global direct emissions from sources owned or controlled by the reporting company or facility, including stationary combustion, mobile combustion, process emissions and fugitive emissions.

Scope 2 emissions are indirect GHG emissions that the company or facility has caused through its consumption of energy in the form of electricity, heat, cooling or steam.

Scope 3 emissions are indirect emissions that arise as a consequence of a company's or a facility's activities from sources that are owned or controlled by others. For example, this includes emissions associated with the transportation of an end product, corporate travel, or the emissions produced in the manufacturing of an input to the main production process.

2. What are 'material climate-related risks and opportunities'?

Companies should include in their reporting a description of how the materiality of their emissions was assessed. Further guidance on determining materiality can be found at the link below.

Climate Disclosure Standards Board. 2018. Materiality and Climate-related Financial Disclosures. *https://www.cdsb.net/sites/default/files/materiality_and_tcfd_paper.pdf*

3. What types of commitments can be made at the corporate level with regards to climate change?

There are many types of commitments that can be made at the corporate level with regards to climate change. These include, but are not limited to:

- Intensity targets that allow for total emissions to increase with organic growth or acquisitions made by the company. They can be useful for evaluating the efficiency of a company's operations and processes.
- Absolute emission targets that impose on the company a level of reduction that does not depend on performance.
- Carbon neutrality targets that commit the company to achieving net-zero emissions by implementing internal strategies (e.g., improving operational efficiencies, purchasing renewable energy) or external measures (e.g., investing in carbon offset projects, investing in research & development of carbon reduction technologies).

4. What is a carbon offset?

A carbon offset is a unit of carbon dioxide equivalent (CO2e) that is reduced, avoided, or sequestered to compensate for emissions occurring elsewhere (e.g., at a mine or smelter). Offsets work in a financial system where, instead of reducing its own carbon use, a company can comply with emissions caps by purchasing an offset from an independent organization that completed and certified an emissions reduction, avoidance or sequestration project. For the purpose of TSM, an offset must be: independently verified by an accredited body, fungible and pass a credible additionality test.

5. What are net-zero emissions?

On a global scale, meeting the ambition to limit global warming to well below 2°C (above pre-industrial levels) by 2050 requires the global community to strike a balance between

emission sources and sinks. Net zero emissions (also referred to as carbon neutrality) means that GHG emissions released into the atmosphere are balanced by an equivalent reduction elsewhere.

WEF. 2020 What's the difference between carbon negative and carbon neutral?. https://www.weforum.org/agenda/2020/03/what-s-the-difference-between-carbon-negative-and-carbon-neutral/

IETA. 2020. IETA Council Guidance on Net Zero Climate Ambition. https://www.ieta.org/resources/IETA-Council/Net%20Zero%20Guidance/IETA_Net_Zero_Climate_Ambition_1June2020.pdf

6. Can corporate disclosures meet criteria for facility-level reporting?

Corporate disclosures can address both corporate- and facility-level reporting requirements, as long as corporate reporting includes all facility-level reporting requirements outlined in the protocol.

7. What types of commitments can be made to contribute to Scope 3 emissions reductions?

Commitments to contribute to Scope 3 GHG emissions reductions can be expressed in absolute or intensity terms.

Examples can include:

- Development of products and processes that reduce other parties' Scope 1 GHG emissions.
- Commitment to drive the adoption of emissions reduction targets among a company's suppliers or customers.
- Elimination or reduction of GHG-intensive inputs.
- Adoption of a best practice in the sector.
- Increased use of reusable materials.

Science Based Targets, Gold Standard, Navigant. 2018. Value Change in the Value Chain: Best Practices in Scope 3 Greenhouse Gas Management. https://sciencebasedtargets.org/wp-content/uploads/2018/12/SBT_Value_Chain_Report-1.pdf

Science Based Targets. 2020. Science-Based Target Setting Manual. Version 4.1. *https://sciencebasedtargets.org/wp-content/uploads/2017/04/SBTi-manual.pdf*

8. What constitute 'additional aspects of business and strategy'?

Examples of 'additional aspects of business and strategy' in the context of Indicator 1, Level AA, of this protocol include: products and services, the supply and value chain, adaptation and mitigation actions, investment in research and development and financial planning, among other relevant areas.

9. In companies where procurement is not managed at the corporate level, can facility procurement and supply chain practices be used to demonstrate alignment with the corporate climate change strategy?

Yes. In cases where the corporate level does not manage most aspects of procurement and supply chain, facility-level practices can be used to demonstrate alignment with the

corporate change strategy.

10. What is an internal carbon price?

An internal carbon price is the application of a designated carbon price for integration into standard financial analyses. The carbon price is treated as a real cost, even though such a cost may not be incurred. In some cases, companies may actually collect fees from their own internal carbon price and allocate this revenue towards projects that contribute to meeting the company's GHG emissions reduction commitments.

Center for Climate and Energy Solutions. 2017. The Business of Pricing Carbon. https://www.c2es.org/site/assets/uploads/2017/09/business-pricing-carbon.pdf

UN Global Compact. 2015. Executive Guide to Carbon Pricing Leadership. https://d306pr3pise04h.cloudfront.net/docs/issues_doc%2FEnvironment%2Fclimate%2FCarbonPricingExecutiveGuide.pdf

11. What types of guidance exist for corporate climate-related disclosures?

The Task Force on Climate-related Financial Disclosures (TCFD) and Carbon Disclosure Project (CDP) provide detailed guidance on the implementation of their respective disclosure criteria. More information can be found at the links below.

TCFD. 2017. Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures. https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Annex-062817.pdf

CDP. 2020. Guidance for Companies. https://www.cdp.net/en/guidance/guidance-for-companies

'Are You Climate Ready?' (AYCR) is a systems approach embedded with useful tools that can provide companies with feedback to self-assess their environmental management systems against the recommendations of the TCFD. The AYCR's four core elements include: a personal assessment to support employees in understanding the importance of climate readiness; support for leveraging the value of an environmental management system to address the TCFD thematic areas of governance, strategy, risk management, and metrics and targets; connection between the business and environmental objectives from their environmental management system to the UN Sustainable Development Goals and Project Drawdown; and feedback on patterns and trends to identify strengths and weaknesses with insight on opportunities.

For more information, see: *AreYouClimateReady.com*

12. What types of guidance exist to support the assessment of the climate-related resilience of a business strategy?

This criterion refers to the broader business or corporate strategy at play and how it considers the potential impacts of climate change on a company's ability to implement the planned strategy. The TCFD advises organizations to describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a lower-carbon economy consistent with a 2°C or lower warming scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks. This includes considerations around:

- Whether an organization believes their strategies may be affected by climate-related

risks and opportunities.

- How these strategies might change to address such potential risks and opportunities.
- The climate-related scenarios and associated time horizons considered.

The TCFD's materials, listed below, provide detailed guidance on conducting scenario analyses that can be used by companies to better understand the resiliency of their business or corporate strategies.

TCFD. 2017. Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures. https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Annex-062817.pdf

TCFD. 2017. Recommendations of the Task Force on Climate-related Financial Disclosures. https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-2017-TCFD-Report-11052018.pdf

13. How can a company conduct a good scenario analysis?

The TCFD has developed a technical supplement, referenced below, that provides detailed guidance on the application of scenario analyses.

TCFD. 2017. The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities.https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Technical-Supplement-062917.pdf

14. In cases of mergers or acquisitions, how should companies adapt their climate change strategies and commitments?

When purchasing an asset, a company will add the emissions from that asset to their overall emissions calculations. When selling an asset, a company should subtract those emissions from their overall emissions calculations. These changes in the company's overall emissions profile should then be reflected in the company's climate change strategy and commitment as appropriate.

15. How can a company demonstrate an understanding of how the commodities and products in which it invests or that it uses contribute to societal climate change resiliency and the low carbon economy?

To meet this criterion, a company's reporting should describe how it contributes to societal climate change resiliency and the low carbon economy through the commodities and products that it produces or uses. For example, a company could explain how its investments in certain battery metals support the transition to a low carbon economy by meeting demand for electric vehicles.

16. How can corporate GHG reduction commitments align with the commitment to limit global warming to well below 2°C (above pre-industrial levels)?

The *Paris Agreement*, which entered into force in November 2016, aims to strengthen the global response to the threat of climate change by keeping a global temperature rise this century to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. The Intergovernmental Panel on Climate Change (IPCC) is a leading authority on emissions scenarios and may serve as a valuable

resource for companies to use in assessing their emissions reductions targets. Other resources are outlined below. As this is an evolving field, members seeking additional guidance should reach out to MAC for further support.

Note that the *Paris Agreement* does not specify what period in history should be considered 'pre-industrial'. The IPCC *Special Report on Global Warming of 1.5°C* uses the reference period 1850–1900 to represent pre-industrial temperature.

United Nations Climate Change. 2020. The Paris Agreement. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

Science Based Targets. 2020. What is a Science Based Target? https://sciencebasedtargets.org/what-is-a-science-based-target/

Science Based Targets. 2020. SBTi Criteria and Recommendations. https://sciencebasedtargets.org/wp-content/uploads/2019/03/SBTi-criteria.pdf

IPCC. 2019. Special Report on Global Warming of 1.5°C. https://www.ipcc.ch/sr15/

17. How can companies apply carbon price scenarios in strategic development and decision-making processes?

For guidance on applying carbon price scenarios, see the following resources:

CDP. 2017. *Putting a price on carbon: Integrating climate risk into business planning. https://cdn.cdp.net/cdp-production/cms/reports/documents/000/002/738/original/Putting-a-price-on-carbon-CDP-Report-2017.pdf?1507739326*

Ecofys, The Generation Foundation, and CDP. 2017 *How-to guide to corporate internal carbon pricing – Four dimensions to best practice approaches. https://guidehouse.com/-/media/www/site/downloads/energy/2018/cpu2017howtoguidetointernalcarbonpricingfinal.pdf*

United Nations Global Compact. 2015. *Executive Guide to Carbon Pricing Leadership: A Caring for Climate Report. https://d306pr3pise04h.cloudfront.net/docs/issues_doc%2FEnvironment%2Fclimate%2FCarbonPricingExecutiveGuide.pdf*

Center for Climate and Energy Solutions. 2017. 'The Business of Pricing Carbon'. https://www.c2es.org/site/assets/uploads/2017/09/business-pricing-carbon.pdf

18. What types of strategic investments could contribute to societal climate change resiliency and the low carbon economy?

A company's understanding of how its strategic investments contribute to societal climate change resiliency and the low carbon economy can be demonstrated by, for example:

- Decisions around the commodities in which the company invests (e.g., metals used in clean energy technologies for emissions reduction)
- High-impact climate-related initiatives (e.g., investments in technological innovations that achieve significant emissions reductions)

19. What is an annual management review?

Annual management reviews are intended to ensure continual improvement by evaluating the status of actions from the previous management review and the effectiveness of the

energy and GHG emissions management systems in place. The management review process should identify opportunities for improvement and describe associated action plans. It should identify and evaluate the potential significance of changes since the previous management review that are relevant to energy and GHG emission, including:

- Changes to legal requirements, standards and guidance, industry best practice, and commitments to COI.
- Changes in mine operating conditions (e.g., production rate) or site environmental conditions.
- Changes outside the mine property that may influence the nature and significance of potential impacts resulting from the facility on the external environment or vice versa.

The management review should also provide a summary of significant issues related to the overall performance of the facility and its energy and GHG emissions management system, including compliance with legal requirements, conformance with standards, policies and commitments and the status of corrective actions.

20. What are communities of interest (COI)?

According to the *TSM Indigenous and Community Relationships Protocol*, COI include all individuals and groups who have an interest in, or believe they may be affected by, decisions respecting the management of operations. Facility COI may include, but are not restricted to:

- Indigenous peoples
- Community members
- Under-represented groups
- Employees
- Contractors/suppliers
- Neighbours
- Local environmental organizations and other non-governmental organizations (NGO)
- Local governments and institutions

Other COI may include:

- Suppliers
- Customers
- Regional or national environmental organizations and other non-governmental organizations (NGO)
- Governments
- The financial community
- Shareholders

While TSM is designed to measure performance at the facility level, companies should identify COI with an interest in their operations beyond the local level. For example, shareholders or downstream users of mined products (e.g. jewelry manufacturing) may have an interest in the environmental and social performance of a facility. Furthermore, a company may engage with suppliers to understand the practices being employed throughout their supply chain (e.g. feed stock supplied to an operation). The way in which a facility engages with different COI will vary depending on the context.

21. How can facilities engage or collaborate with COI on climate change management?

Some examples of ways in which a facility can involve COI in climate change management

include:

- Engagement of COI in the development of a facility's physical climate impact assessment and in the identification and prioritization of adaptation measures
- Effective communication of a facility's approach to managing physical climate impacts and adaptation
- Sharing of information and analysis on local physical climate impacts
- Support for local or regional COI to respond to potential climate impacts (e.g., infrastructure to address future water scarcity, natural disaster planning)

22. What is an "internal or external audit"?

An audit is a formal, systematic and documented examination of conformance with explicit, agreed-upon, prescribed criteria. Audits evaluate and report on the degree of conformance with stipulated criteria, based on the systematic collection and documentation of relevant evidence. Audits involve some degree of judgment but are not designed to determine the root cause of deficiencies or to evaluate management system effectiveness. Audits can be conducted by internal or external professionals.

- An **internal audit** is conducted by employees of the company with appropriate knowledge and competencies. These employees must be independent, impartial and objective with respect to the management of the facility being audited. For example, they could work at another facility or at the corporate level.
- An **external audit** is conducted by auditors that are external to the company being audited. These auditors maintain an objective viewpoint throughout the audit process to ensure that findings and conclusions are based only on the evidence.

Facilities can also meet this criteria by demonstrating that an evaluation of effectiveness or an independent review has been conducted:

- An **evaluation of effectiveness** is an assessment of whether the intended results of the management system are being achieved, beyond determining whether a criteria has been met. It considers both the extent to which planned activities have been realized and the extent to which performance objectives and indicators have been achieved.
- An **independent review** is commentary, advice and recommendations that are independent, objective and expert in nature and meant to assist in identifying, understanding and managing risks. The intention or spirit of the term 'independent' is that the reviewer(s) should not be directly involved in the design or operation of the particular facility. Where potential conflict of interest exists, such conflicts should be identified and declared. For example, it is acceptable to have an independent reviewer who is employed by the same company, provided the intent of 'independent' is met. This is further reinforced by maintaining a clear understanding that an independent reviewer may need to abstain from a discussion or withhold an opinion when a conflict of interest may apply. This flexibility allows the independent review process to maximize the use of appropriately qualified reviewers, understanding that there may be a limited pool of such qualified individuals available.

23. What are examples of non-energy GHG emissions?

Some examples of non-energy GHG emission include fugitive methane and the acidification of carbonate ore. It is also possible that a facility has no significant sources of non-energy GHG emissions. Facilities should include in their reporting a description of how the significance of their non-energy GHG emissions was assessed.

24. What is independent assurance?

Independent assurance can be demonstrated through an external audit or other form of third party verification.

- An audit is a formal, systematic and documented examination of conformance with explicit, agreed, prescribed criteria. Audits evaluate and report on the degree of conformance with stipulated criteria, based on the systematic collection and documentation of relevant evidence. Audits involve some degree of judgment but are not designed to determine the root cause of deficiencies or to evaluate management system effectiveness. Audits can be conducted by internal or external professionals. An external audit is conducted by auditors that are external to the company being audited. These auditors maintain an objective viewpoint throughout the audit process to ensure that findings and conclusions are based only on the evidence.
- Third party verification is an accredited and independent process to ensure that the information being assured is accurate and adheres to a specific set of criteria (e.g., *ISO 14064-3: Specification with guidance for the verification and validation of greenhouse gas statements*).

25. How long is an audit or independent assurance valid?

Independent assurance is valid for three years for the purposes of TSM.

26. Can regional assessments be used to identify potential physical climate impacts at the facility level?

Yes. Where there is regional information available or where a company operates multiple facilities in the same region, it is appropriate to conduct a single regional assessment of potential physical climate impacts and then consider these risks in decision-making and in the adaptation strategies to be employed at each facility.

27. How can a facility demonstrate efforts to engage with COI on climate change mitigation and adaptation?

At Level A, a facility is tasked with gauging the level of importance of climate change mitigation and adaptation for COI and then engaging as appropriate. If COI prove interested in engaging on climate change, then facilities can provide evidence of this engagement (e.g., meeting records). In other cases, the facility may find that climate change is not a priority issue for COI. However, the facility will still need to demonstrate that it has made efforts gauge the level of importance of the issue with COI. Some examples include:

- Evidence that COI were informed about opportunities to engage on climate change during the course of other regular engagement activities (e.g., meeting agenda, meeting minutes)
- Evidence that the interests and attributes of COI have been recorded (as required in the *TSM Indigenous and Community Relationships Protocol*) and that climate

change has not been identified as a key issue for any COI
- Evidence that the facility has conducted proactive outreach to COI that they think might have an interest in climate change (e.g., environmental groups, local authorities)

28. How can a facility consider the level of risk associated with a potential physical climate impact in the identification of adaptation measures?

The facility must conduct physical impacts climate modelling that includes, at a minimum, rainfall, extreme weather and temperature events at the facility and at other sites relevant to operations (e.g., ports, water sources, etc.). Risks and opportunities resulting from these physical impacts should be assessed and, where possible, estimates should be assessed for both the costs of implementation and non-implementation of these mitigation measures.

29. What types of climate scenarios should be used in a facility's assessment of its physical climate vulnerabilities and risks?

Refer to MAC's *Guide on Climate Change Adaptation for the Mining Sector* for detailed guidance on characterizing future climate, selecting future climate projections, and assessing physical climate vulnerabilities and risks.

30. Can offsets be used to meet emissions reduction performance targets?

Yes. Emissions reduction performance targets can be met by a combination of on-site reductions and offsets, including performance credits. However, if offsets have been used to meet targets, the percentage and source of offsets used must be clearly documented and their use should not exceed any regulatory caps that may be in place for a facility.

31. Do targets need to apply to the entire facility?

Targets do not need to apply to the entire facility. Some targets may apply to equipment, while others may address the energy consumption of certain departments, training or additional measuring and monitoring.

32. Can a facility with distinctly different production processes set separate energy and GHG emissions performance targets?

Yes. A facility can set different performance targets for each production process, particularly when a facility uses intensity-based targets. For example, a single indicator may not be sufficient in the case of an open pit facility that is comprised of the pit and a concentrator, or where smelters are processing an increasing amount of recycled material. It may be necessary to have multiple targets at a single facility where the dynamics of the production processes are so different that one common target is not adequately representative nor a consumption driver for each production process.

33. Where regulation mandates a specific performance target for a facility, can this target be used for the purposes of Indicator 3?

Yes, targets mandated by regulation can be used by sites as the performance target set in this indicator.

34. What type of information on physical climate impacts needs to be publicly reported?

At a minimum, the facility should publish a summary of its projections of future climate

conditions, assessment of potential physical climate impacts that could have direct or indirect impacts off site, and any plans or actions taken to manage these identified risks. Particular attention should be paid to providing information of relevance to local COI.

35. What are material Scope 3 GHG emissions and how can they be calculated?

For the purpose of this protocol, facilities must define criteria to determine whether a particular source of Scope 3 GHG emissions is material to their management system. Where this definition is made at the corporate level, facilities can use corporate definitions and information to respond to this criteria. Guidance on calculating Scope 3 GHG emissions and determining materiality can be found in the following reference material:

Greenhouse Gas Protocol. 2013. *Technical Guidance for Calculating Scope 3 Emissions.* https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf

Chartered Professional Accountants Canada. 2019. *Disclosing the impact of climate change: A process for assessing materiality.* https://www.cpacanada.ca/en/business-and-accounting-resources/financial-and-non-financial-reporting/sustainability-environmental-and-social-reporting/publications/assessing-materiality-of-climate-change

Task Force on Climate-related Financial Disclosures. 2017. *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures*. https://assets.bbhub.io/company/sites/60/2020/10/FINAL-TCFD-Annex-Amended-121517.pdf

36. What types of targets can be used to assess performance on energy related to Scope 1 and 2 GHG emissions?

Informed by any relevant corporate commitments, a facility should evaluate opportunities to set performance targets related to Scope 1 and 2 GHG emissions. A facility may choose to set one or more of the following types of performance targets:

- *A volume target* refers to an absolute amount of energy consumed or carbon dioxide equivalent (CO2e) emitted by the facility. Such targets are independent of production. Typically, volume targets are defined relative to current or historical data (e.g. 5% reduction from 2015 baseline) but may also be set against business-as-usual projections.
- *An intensity target* refers to the ratio of consumption or emissions relative to production. This is often referred to as ‘normalizing’ the data. Examples include emissions or energy use per tonne of copper cathode produced or per tonne of ore processed.
- *An activity-based target* is an established target where future energy consumption or GHG emissions will be reduced or avoided due to a specific activity. Such targets could include initiatives or projects that lead to energy not being consumed that would otherwise have been consumed if the project had not been implemented.
- *A control target* establishes a level or measure of effectiveness of a control over an activity that is linked to either the consumption of energy or the release of GHGs. A control may include operational limits on production equipment or administrative requirements on various mining activities. Examples include:

- Conformance with operational limits for unit operations that are key consumers of energy or emitters of GHG emissions (e.g. 100% conformance with operating within the upper and lower temperature limits in a dryer)
- Compliance with an administrative control (e.g. 95% compliance with a no-idle policy)

As Scope 2 emissions are associated with third-party electricity generation, facilities are deemed to have addressed these emissions through management of their electricity use.

37. How can a facility that is not in full operation set an appropriate performance target?

It is not mandatory for facilities to implement TSM prior to entering full operation. Should facilities wish to implement TSM prior to reaching full operation, one approach is to set an activity-based target. For example, by 2025, the facility will have implemented energy and GHG performance improvement projects that provide 1,500 GWh/year of energy savings or 250 CO2e/year of GHG reductions. Or, that 30% of vehicles or 50% of lighting fixtures will have been swapped for more energy efficient models.

38. What should be considered when setting a performance target?

When selecting targets, environmental, economic, and social issues should be taken into consideration. A facility may want to consider:

- Relevant corporate commitments
- Financial criteria and priorities
- Alternative energy sources
- Maintenance and infrastructure needs
- Operational requirements and constraints
- Quality and appropriateness of energy resources
- Environmental impacts
- Safety and health issues
- Available human and technical resources
- Energy management system, including areas of significant use and drivers
- Life of mine
- Previous energy performance
- Alignment with stated goals and objectives
- Energy and GHG emissions reductions

Targets should be:

- Ambitious, to commit the organization to continual improvement
- Realistic, so that they can be achieved within specific time limits
- Specific and measurable

39. How can a facility demonstrate progress towards energy and GHG emissions performance targets?

There are a variety of ways in which a facility can demonstrate progress towards its performance targets. One option is through multi-year targets. A multi-year target is an energy or GHG emissions target that specifies certain performance over a defined number of years (e.g., a 20% reduction over a three-year period). The target may make sense for a facility that is implementing a multi-year capital plan or infrastructure upgrade that will result

in emissions reductions or energy savings only when the final plan is complete. In such a case, it is difficult to determine if a facility is meeting expectations toward the target if progress is not linear. Instead, an action plan outlining the specific steps that will be implemented each year until the plan is complete should be used to assess progress.

Such actions may include, but are not limited to, new operating procedures to be implemented, new equipment to be purchased and installed, or new processes to be commissioned. Actions in the plan should be specific and measurable and should clearly contribute to achieving the reduction specified in the multi-year plan. For a facility to achieve a Level A under Indicator 3, it must be able to demonstrate that previously declared annual milestones for the current year of a multi-year target have been achieved in the reporting year. Energy performance improvement plans must be made on a cycle of no more than three years.

Other examples of how a facility can demonstrate progress towards an energy and GHG emissions performance target include:

- Demonstration of the implementation, or process of implementation, of emissions reduction projects or plans to change energy sources
- Capital allocation towards emissions reduction projects
- Actions implemented as part of a broader plan to achieve the performance targets
- Measured and verified energy or GHG reductions resulting from a specific performance improvement initiative
- Percentage of previous year's energy or GHG performance target achieved
- Improvements in the energy and GHG management system
- A study commissioned to investigate potential improvement opportunities
- Active participation in energy efficiency collaborative processes (e.g. Coalition for Energy Efficient Comminution)

40. What methodology can be used to create a practical target for mines being developed and operated at greater depths?

In some instances, underground mines are developing new production zones at much greater depth. This leads to greater energy intensity because of the extra energy required for ventilation, pumping, cooling, hoisting, and sustaining the infrastructure. A zero-based energy budget can be used to determine the new intensity level as well as the performance indicator and target. The zero-based energy budget is established by estimating baseline consumptions for each mining activity (e.g. ventilation, pumping, lighting, hoisting) at depth for a convenient period of time and then determining the expected total monthly and annual consumptions relative to forecasted production levels. Typically, operations monitor total monthly consumption versus the estimated consumption budget. However, the total estimated monthly consumption can be divided by the forecasted production to determine monthly intensity targets. Actual performance can then be tracked throughout the year versus these target intensities.

APPENDIX 2: TSM SELF ASSESSMENT CHECKLIST

Climate Change

Facility Name:		Company Name:	
Assessed By:		Date Submitted:	

Supporting Documentation / Evidence:	
Name of Document	**Location**

Interviewees:			
Name	**Position**	**Name**	**Position**

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
INDICATOR 1: CORPORATE CLIMATE CHANGE MANAGEMENT					
Indicator 1 Level B	1. Has a corporate action plan been developed to meet all requirements for a Level A?				
	2. Is data on Scope 1 and 2 GHG emissions maintained?				
	If you have answered "Yes" to all of the Level B questions, continue to the Level A questions. If you have not answered "Yes" to all of the Level B questions, assess the facility as a Level C.				
Indicator 1 Level A	1. Is there a demonstrated corporate climate change strategy that is supported by defined actions, including integration of the strategy into business planning for existing activities and in considerations for new projects?				
	2. Are board and management structures, accountabilities, responsibilities and reporting processes related to the governance of climate-related risks and opportunities in place?				
	3. Are material climate-related risks and opportunities and their impact on the company's businesses, strategy and financial planning identified, assessed and managed?				
	4. Are materials demonstrating the above criteria publicly reported on an annual basis?				
	If you have answered "Yes" to all of the Level A questions, continue to the Level AA questions. If you have not answered "Yes" to all of the Level A questions, assess the facility as a Level B.				

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
Indicator 1 Level AA	1. Is there a demonstrated corporate commitment to climate action that is consistent with the ambition to limit global warming to well below 2°C (above pre-industrial levels), with short- and long-term targets and actions planned to achieve these commitments?				
	2. Is performance measured against stated targets in Level AA Criterion #1?				
	3. Are processes for identifying, assessing and managing material climate-related risks and opportunities integrated into the company's risk management approach?				
	4. Has the resilience of the business strategy been considered, taking into consideration different climate-related scenarios, including high- and low-warming scenarios?				
	5. Are the impacts of material climate-related risks and opportunities identified on additional aspects of business and strategy identified, assessed and managed?				
	6. Is there a demonstrated understanding of how the company's strategic investments contribute to societal climate change resiliency and the low carbon economy?				
	7. Do procurement and supply chain management practices demonstrate alignment with the corporate climate change strategy?				
	8. Does the corporate climate change strategy include at least two of the following elements?				

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
	a. Planned or actual investments in climate action (e.g., research and development, energy performance improvements, clean energy projects) that will lead to measurable improvements in climate change mitigation or adaptation.				
	b. Key performance indicators related to the implementation of the climate change strategy assigned to relevant corporate employees, with tracking on at least a quarterly basis				
	c. A range of potential carbon price scenarios used when developing strategies or evaluating and making decisions on projects				
	d. Opportunities for offsets that benefit communities of interest evaluated and, where feasible, prioritized				
	9. Are materials demonstrating the above criteria publicly reported on an annual basis?				
	If you have answered "Yes" to all of the Level AA questions, continue to the Level AAA questions. If you have not answered "Yes" to all of the Level AA questions, assess the facility as a Level A.				
Ind 1 AAA	1. Does the corporate climate change strategy include all of the elements outlined in Level AA Criterion #8?				
	2. Are there demonstrated corporate commitments:				
	a. Corresponding with societal ambitions to achieve net-zero emissions by 2050, with short- and long-term targets and actions planned to achieve these commitments?				

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
	b. That future major capital allocation decisions will consider alignment with societal ambitions to achieve net-zero emissions by 2050?				
	c. To contribute to Scope 3 GHG emissions reductions?				
	3. Have short- and long-term actions to achieve stated targets in Level AA Criterion #1 and Level AAA Criterion #2(a) been, or are they on track to be, met on the timescale identified, or have corrective actions been identified and are these corrective actions being implemented?				
	4. In jurisdictions without a carbon pricing regime, does the company apply an internal carbon price in standard financial analyses?				
	5. Are materials demonstrating the above criteria publicly reported on an annual basis?				
	If you have answered "Yes" to all of the Level AAA questions, assess the facility as a Level AAA. If you have not answered "Yes" to all of the Level AAA questions, assess the facility as a Level AA.				
	ASSESSED LEVEL OF PERFORMANCE FOR INDICATOR 1				**Level:** _____

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
INDICATOR 2: FACILITY CLIMATE CHANGE MANAGEMENT					
Indicator 2 Level B	1. Has a basic energy use and GHG emissions management system has been established that includes:				
	a. A demonstrated senior management commitment to manage energy use and GHG emissions, with assigned responsibility to a department or individual at the facility level?				
	b. Identification and disaggregation of significant sources of energy consumption and GHG emissions?				
	c. Identification and estimation of significant sources of non-energy GHG emissions?				
	2. Has the facility conducted some analyses related to physical climate impacts and adaptation?				
	3. Has the facility developed an action plan to meet all requirements for a Level A?				
	If you have answered "Yes" to all of the Level B questions, continue to the Level A questions. If you have not answered "Yes" to all of the Level B questions, assess the facility as a Level C.				
Indicator 2 Level A	1. Is an energy and GHG emissions management system established that includes:				
	a. A data collection and monitoring process that is appropriate for the energy use and GHG emission sources on site?				
	b. Clear definition of roles and responsibilities for managing energy and GHG emisssions performance?				
	c. Operator awareness and understanding of parameters influencing energy performance and operator actions to optimize system energy performance for significant energy uses or GHG emission sources?				
	d. Consideration of energy and GHG emissions in business planning, including design criteria, where appropriate?				
	e. An annual management review?				
	2. Is a process for the management of physical climate impacts and adaptation established that includes:				

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
	a. Assessment and identification of potential physical climate impacts, with a review of this analysis scheduled at predetermined intervals?				
	b. Consideration of risks resulting from potential physical climate impacts in relevant facility-level decision-making?				
	c. Identification, prioritization and implementation through business planning of adaptation measures that respond to the identified physical climate impacts?				
	3. A process is in place to promote awareness of climate change mitigation and adaptation, including relevant corporate commitments and facility-level targets, to employees and contractors.				
	4. The facility gauges the level of importance of climate change mitigation and adaptation in relation to relevant or affected communities of interest (COI) and engages as appropriate.				
	If you have answered "Yes" to all of the Level A questions, continue to the Level AA questions. If you have not answered "Yes" to all of the Level A questions, assess the facility as a Level B.				
Indicator 2 Level AA	1. Does the facility collaborates with COI interested in climate change as appropriate?				
	2. Has the energy and GHG emissions management system undergone an internal or external audit?				
	If you have answered "Yes" to all of the Level AA questions, continue to the Level AAA questions. If you have not answered "Yes" to all of the Level AA questions, assess the facility as a Level A.				
Indicator 2 AAA	1. Does the facility apply three or more of the following leading practices?				
	a. Are key performance indicators related to the reduction of energy use or GHG emissions assigned to relevant employees?				
	b. Are offsets integrated into the management system?				
	c. Is the energy and GHG emissions management system applied to the full lifecycle of facility activities, including in relation to suppliers, customers and other third parties?				

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
	d. Is active partnership pursued with other organizations or COI on physical climate impacts and adaptation management, with roles and responsibilities assigned to support this commitment?				
	e. Is community, cultural or traditional knowledge considered in climate impact assessments and in the design of adaptation measures?				
	If you have answered "Yes" to all of the Level AAA questions, assess the facility as a Level AAA. If you have not answered "Yes" to all of the Level AAA questions, assess the facility as a Level AA.				
	ASSESSED LEVEL OF PERFORMANCE FOR INDICATOR 2				**Level:** _____

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
INDICATOR 3: FACILITY PERFORMANCE TARGETS AND REPORTING					
Indicator 3 Level B	1. Have energy and/or GHG emissions performance targets been set?				
	2. Does some public reporting take place on energy and/or GHG emissions?				
	3. Are standard quantification and estimation methodologies used to convert energy and GHG emissions data into comparable units, including process emissions data?				
	4. Has the company developed an action plan to meet all requirements for a Level A?				
	If you have answered "Yes" to all of the Level B questions, continue to the Level A questions. If you have not answered "Yes" to all of the Level B questions, assess the facility as a Level C.				
Indicator 3 Level A	1. Have performance targets been set focused on Scope 1 and 2 GHG emissions?				
	2. Is a facility-level action plan developed and implemented that includes clear short- and long-term steps towards achievement of the performance targets?				
	3. Is progress demonstrated towards the performance targets?				
	4. Does annual public reporting include:				
	a. Metrics and targets used to assess performance focused on Scope 1 and 2 GHG emissions?				
	b. Where offsets are used to meet targets, a calculation of offsets as a percentage of total emissions generated at the facility and the source and the nature of the accreditation of the offsets?				
	5. Is information on the facility's assessment of potential physical climate impacts and plans or actions to manage the associated risks shared publicly and updated as assessments or plans are updated?				
	If you have answered "Yes" to all of the Level A questions, continue to the Level AA questions. If you have not answered "Yes" to all of the Level A questions, assess the facility as a Level B.				

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
Ind 3 Level AA	1. Have performance targets been met on the timescale identified, or have corrective actions been identified and are the corrective actions being implemented?				
	2. Have energy use and Scope 1 and 2 GHG emissions (e.g., source data, conversion factors, energy GHG intensities used, etc.) been independently assured?				
	3. Does the facility seek feedback on public reporting as appropriate?				
	If you have answered "Yes" to all of the Level AA questions, continue to the Level AAA questions. If you have not answered "Yes" to all of the Level AA questions, assess the facility as a Level A.				
Indicator 3 AAA	1. Has substantial transformation of the energy and GHG emissions profile of the facility taken place, evidenced by the results of process-improvement techniques and technologies or other forms of GHG reductions or offsets, in line with a long-term net-zero emissions commitment?				
	2. Is public reporting, including material Scope 3 GHG emissions data, independently assured for accuracy?				
	If you have answered "Yes" to all of the Level AAA questions, assess the facility as a Level AAA. If you have not answered "Yes" to all of the Level AAA questions, assess the facility as a Level AA.				
	ASSESSED LEVEL OF PERFORMANCE FOR INDICATOR 3				**Level:** _____

For more information about the TSM initiative, visit:

www.TSMInitiative.com

or

The Mining Association of Canada
www.mining.ca/tsm