

# UNEARTHING A GREENER FUTURE

## DIGGING DEEPER INTO EFFECTIVE CLIMATE GOVERNANCE IN THE CANADIAN MINING SECTOR

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## ABOUT THE CANADA CLIMATE LAW INITIATIVE:

The Canada Climate Law Initiative (CCLI) provides businesses and regulators with climate governance guidance so that they can make informed decisions in the transition to a net-zero economy. Powered by the nation's top expertise, we engage with boards of directors and trustees to ensure businesses, pension funds, and asset managers understand their legal duties with respect to climate change. Our legal research offers important insights in a rapidly transforming policy landscape.

CCLI acknowledges that it is situated on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (Musqueam) and is committed to working in partnership with Indigenous Peoples on effective climate governance.

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## EXECUTIVE SUMMARY

Major mining companies are facing a plethora of climate-related risks and opportunities. Physical risks arising from acute and chronic weather events such as floods, fires, droughts, heat waves, windstorms, cold snaps, and hurricanes can pose potential difficulties to ongoing operations for mining companies. Such events can interrupt operations through damage to key infrastructure, disrupting supply chains and impeding employee and community safety. Transition risks, in the form of policy and regulation adjustments, market and reputational shifts, and technological adaptations, if not handled correctly can deter investment, result in costly court cases and fines, and lead to irreparable damage to not only the company's reputation but the reputation of the entire mining sector.

Directors of major mining companies have a fiduciary duty to be cognizant of these risks and opportunities and to act on them with care, skill, and diligence. This includes being continually aware of current and future obligations under the law in areas of disclosure and climate governance. Dependable board oversight, integrated climate strategies, adequate risk management, honest targets and metrics, and consistent and comparable disclosures should now be a usual part of business for mining companies in Canada. While major mining companies have already implemented considerable climate governance practices and sustainability initiatives, stagnation is not an option. Major mining companies are well placed to accomplish more in their journey to net-zero and sustainability.

This guide recognizes five key areas where major mining companies can progress to the next level of climate governance. The first is improved target setting and achievement plans with a view to more detailed scope 1 and 2 emission reductions and practical solutions to achieving them. Some miners have initiated reducing energy consumption through renewable sources, low-carbon alternatives and adaptation to ventilation, heating and cooling, and transportation. Scope 3 emissions provide a distinct sticking point for major mining companies due to a lack of data from key stakeholders throughout the supply chain. Greater collaboration and investment along with substantial shifts in operations will be necessary to achieve scope 3 targets.

The second area of improvement is data collection and measurements. This is directly related to target setting and has a substantial impact on demonstrating progress towards a company's targets. Mining companies need to ensure that they have a credible baseline for their data. Directors should be on the constant lookout for data improvement technologies and initiatives and should be prepared to invest heavily in solving this challenge.

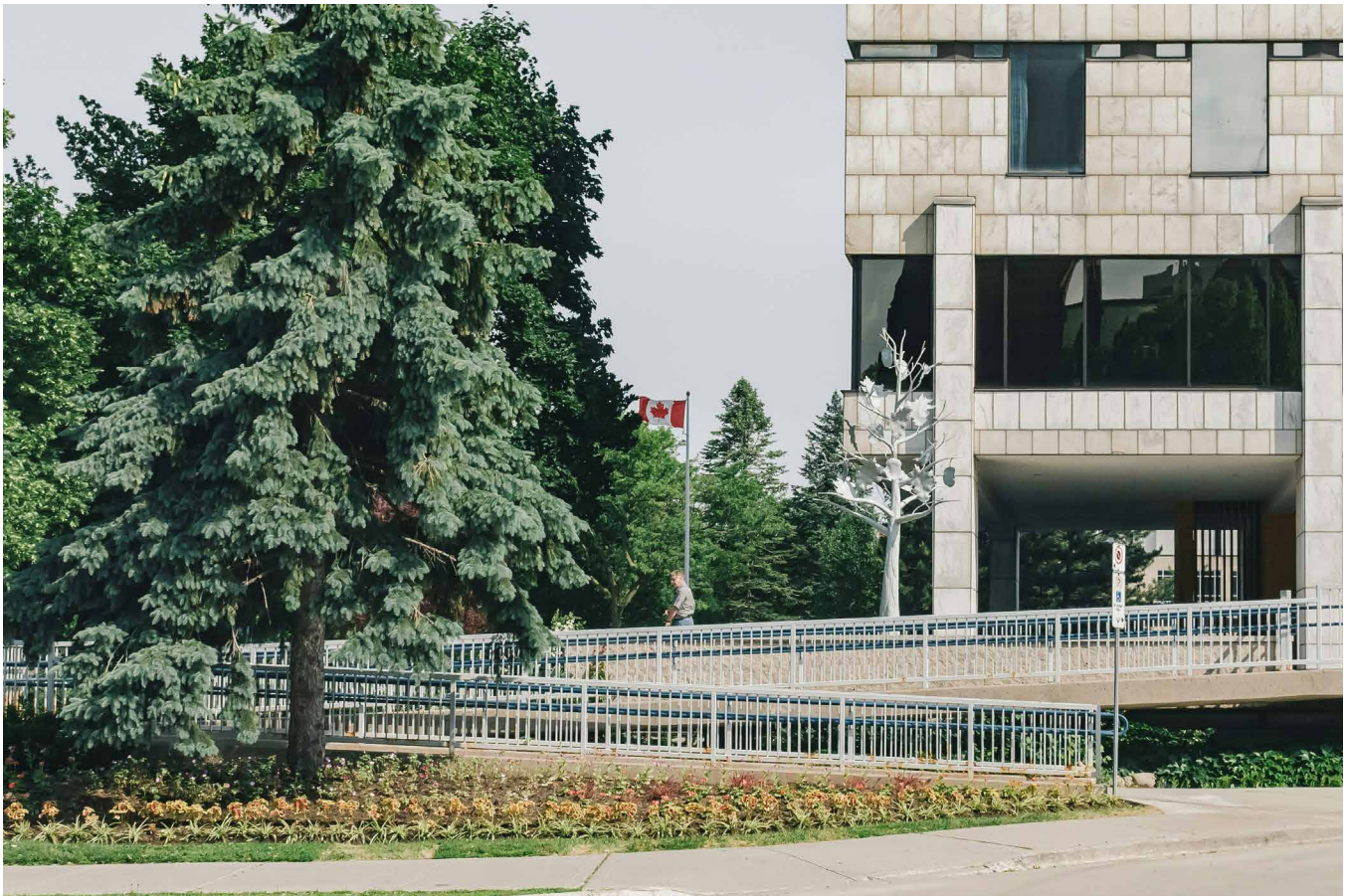
Adaptation initiatives form the third opportunity for improvement. Adaptions to mining operations to protect against physical and transition risks can require substantial initial investment; however, it can pay off in the long-term by limiting downtime on operations and—through greater employee and local community protections—present large reputation and investment returns. Adaption initiatives are

already being implemented through improved water stewardship and tailings management. Helpfully, these initiatives are not mutually exclusive. For example, proposals that reuse and recycle water often benefit the management of tailings management, whilst the removal of toxins from tailings sites prevents them from washing into freshwater sources.

Mining companies can also enhance their climate governance through involvement in the circular economy. This includes the repair, reuse, and recycling of current infrastructure, but also the upcycling of tailings waste (leading to the further extraction of minerals and metals), and the recycling of end-of-life (EOL) products for their materials. The circular economy can alleviate the pressure on mining companies for primary sources of elements from virgin ore, whilst providing mining companies the opportunity to take ownership of their metals and minerals throughout the value chain.

Lastly, mining companies should be taking all reasonable steps to build relationships with local communities around mining sites with regard to ongoing operations and mine closures. Mining companies need to go further in building trust with communities through better consideration and collaboration. In particular, mining companies have an opportunity to ensure license-to-operate (LTO) barriers are overcome by engaging in truth and reconciliation with the local Indigenous Peoples and fostering a greater understanding of the deep connection Indigenous Peoples have with the land. Mining companies should be able to demonstrate to local communities that they respect the land and have full consideration for the impact their mining operations will have on those communities. This can be further emphasized by the mine's engagement with communities of interest (COI) on the rehabilitation of the mine following its closure.

There are mining companies already successfully participating in these important next steps on climate governance and are demonstrating that through practical solutions and investment, these next steps are possible as is unearthing a greener future.



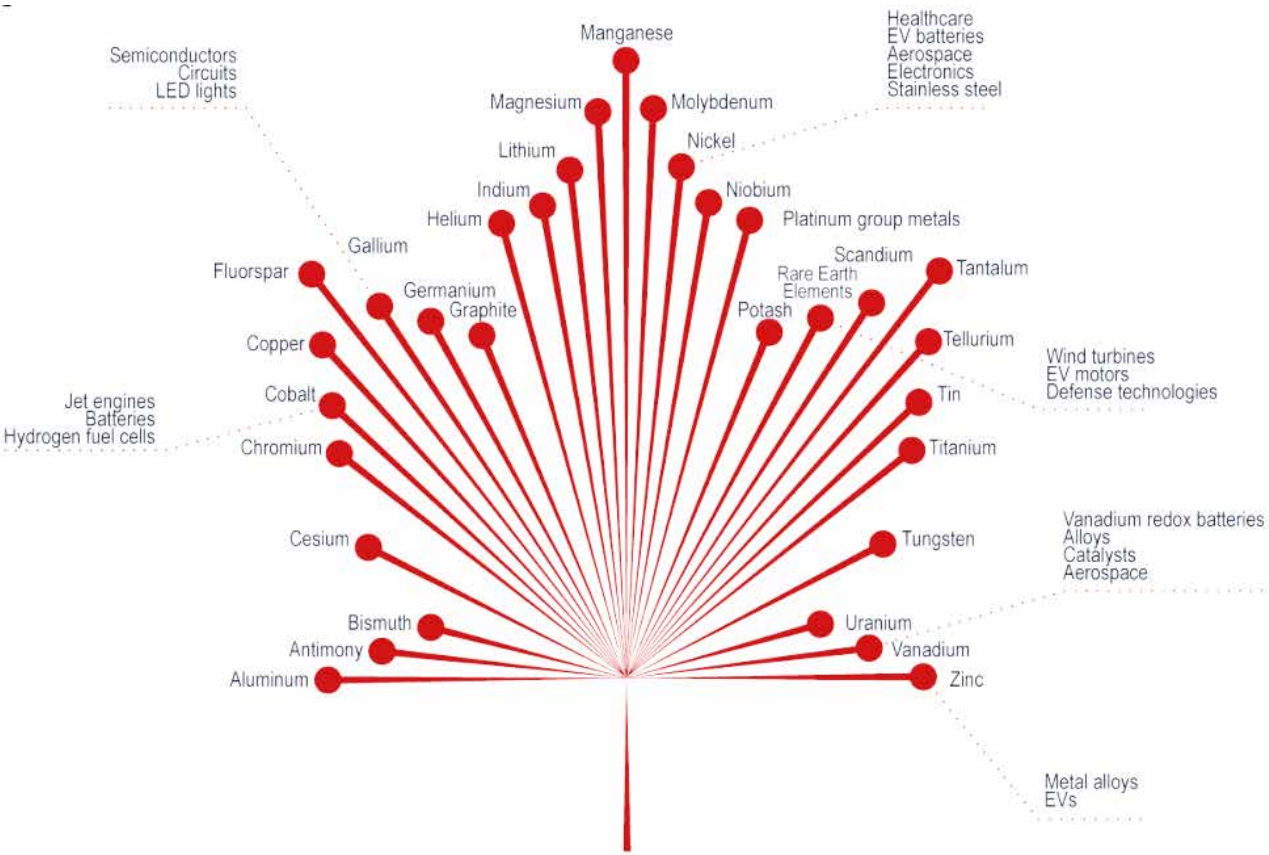
## 1. INTRODUCTION

The Canadian mining industry has a lot to be proud of in its achievements towards climate governance and sustainability. Canadian mining is perceived as the most sustainable mining sector globally, with many Canadian mining companies voluntarily applying the Mining Association of Canada's (MAC) Towards Sustainable Mining (TSM) standards,<sup>1</sup> the first standards worldwide to require site-level assessments in their Canadian and overseas operations.<sup>2</sup> Such assessments include the self-grading of various sustainability performance indicators within several protocols with independent verification required every three years.<sup>3</sup> Specific to climate-related matters, the TSM standards require mining companies to assess themselves against indicators in the Climate Change, Biodiversity Conservation Management, Tailings Management, and Water Stewardship protocols.<sup>4</sup> Consequently, as of January 2024, nine other jurisdictions have implemented the seven core components of TSM sustainability standards.<sup>5</sup> With more jurisdictions expressing interest in TSM, it could become the global standard in mining sustainability and climate governance.



Global mining companies demonstrate strong results in the level of their climate-related reporting. In 2023 they achieved 93% of reporting coverage compared to 85% in 2022.<sup>6</sup> Canadian mining companies have a large part to contribute to this. They are also an important part of the global move away from fossil fuels and towards sustainable energy sources.<sup>7</sup> As demonstrated by Figure 1, Canada produces 31 critical minerals that are essential for a more sustainable future. For example, out of the 19 metals and minerals required to produce solar panels, 14 are found and/or produced in Canada.<sup>8</sup> This emphasizes how essential the Canadian mining industry is in providing the critical minerals that are necessary to the global move towards net-zero emissions and a more sustainable future. Canadian mining firms must be prepared to produce these minerals and metals whilst achieving their targets towards net-zero.<sup>9</sup>

**FIGURE 1: CANADA'S 31 CRITICAL MINERALS AND SOME OF THEIR USES**



Source: Government of Canada, The Canadian Critical Minerals Strategy - From Exploration to Recycling: Powering the Green and Digital Economy for Canada and the World (Government of Canada, 2022) at 9.

Canadian mining companies are advanced in effective climate governance. However, there are significant areas where the Canadian major mining sector could improve or move to new stages of climate governance. For instance, the quality of climate-related reporting for the global mining sector in 2023 was only 51%.<sup>10</sup> With Canadian mining companies constituting almost 75% of global mining companies,<sup>11</sup> this is a reflection of the quality of disclosure by Canadian mining companies too. Canadian mining companies are also behind on performance targets for greenhouse gas (GHG) emissions under the TSM standards with only 60% of Canadian mining companies reporting an appropriate level.<sup>12</sup> Moreover, more is required beyond the usual climate-related disclosures. Mining companies need to see beyond the accepted Task Force on Climate-Related Financial Disclosure (TCFD) recommendations and push towards improving their target setting and progress reporting, enhancing their data collection and measurements, implementing adaptation initiatives, moving towards a more circular economy, and consulting and collaborating with communities of interest (COI) about ongoing mining operations and closure of the mining sites.

For the purpose of this guide, major mining companies constitute large, established and experienced mining companies, primarily involved in the extraction and production of minerals and metals. This guide aims to support major mining companies in assessing their current and future climate governance strategies by highlighting the key areas of concern and providing timely information on how best to implement effective climate governance now and going forward.



## 2. CLIMATE-RELATED RISKS AND OPPORTUNITIES IN THE CANADIAN MINING SECTOR

In its annual review of global mining sector risks, Ernst and Young (EY) reports that Environmental, Social, and Governance (ESG) is the top risk faced by the mining sector in 2024, followed by licence to operate (LTO) third, and climate change fourth.<sup>13</sup> For the major mining sector, ESG includes priorities such as water stewardship, circular economy, local community impacts, tailings, waste management and Indigenous trusts and reconciliation. LTO raises risks concerning reputational and community relations that can impact a mine's ability to work at various sites, and climate change focuses on net-zero, decarbonization, the impact of mine operations on local environments and, subsequently, the communities that subsist on them.

The risks, whether physical, or transitional are dependent on several variables such as the location of mining sites (this affects current and future climate assessments and geographical impacts to changes in the climate around the site), the size and life cycle of the mine, the existing mine infrastructure, and the prevailing climate governance and risk management in operation.<sup>14</sup> Each

company and operating site will, therefore, need to make a critical assessment of the climate-related risks and opportunities that are relevant to them.

## 2.1 PHYSICAL RISKS AND OPPORTUNITIES

Physical risks are risks borne from acute and chronic weather events. Acute weather events are intense short-term weather phenomena such as hurricanes, floods, droughts, heat waves and cold snaps, wildfires, cyclones, and windstorms. Chronic events are changes to the climate over the long term representing sustained heat waves and droughts, variable precipitation and wind patterns, and sea level rises. These risks, whether acute or chronic, have an impact on a mining company's ability to operate. All risks have the potential to disrupt mining projects by:

- Limiting access to the sites.
- Interrupting supply chains through damage to transport infrastructure.
- Causing injury or death to employees.
- Overtopping of spillways and diversion structures.
- Creating difficulty in the management of tailings piles as droughts lead to dry stack tailings.
- Oxidisation of sulphide materials due to insufficient saturation caused by drought.
- Mine flooding as a consequence of water inundation.
- Damaging energy infrastructure.
- Reducing transmission capacity due to heat waves or storms.
- Interfering with telecommunications infrastructure.
- Reducing access to hydroelectricity due to drought conditions.
- Causing conflict with local communities over water resources in times of drought.
- Impeding the opening, closing, and reclamation of sites owing to fluctuations in biodiversity and ecosystems.<sup>15</sup>

A more detailed list of climate-related physical risks and their impact on mining operations can be found in Appendix E of MAC's Guide on Climate Change Adaptation for the Mining Sector.<sup>16</sup>

Recent acute weather events in Canada and Burkina Faso demonstrate the urgency with which effective climate governance must be implemented. Smoke from the June 2023 wildfires in Canada caused the suspension of mining operations in Québec as several roads and railways were closed and miners evacuated.<sup>17</sup> Mudslides caused by severe flooding in Vancouver in 2021 resulted in rail and road closures impacting several mining operations,<sup>18</sup> whilst a Vancouver-owned mining operation in Burkina Faso was hit by flash flooding killing eight miners who were trapped underground. Trevali Mining Corp failed in its climate governance resulting in a loss of life, manslaughter convictions for two of its executives, the resignation of two c-suite executives, and a Companies' Creditors Arrangement Act (CCAA)<sup>19</sup> bankruptcy filing.<sup>20</sup>

There are opportunities to be found in acute and chronic physical risks that the innovative mining company can take advantage of:

- Milder winters may reduce the need for heating in the ventilation of underground mines.
- Peak flow risks can be ameliorated by milder winters and earlier springs resulting in a lower probability of flooding.
- Snow melts in mining regions may increase the availability of localized water sources.
- Sea ice melts could result in some new mining opportunities in previously inaccessible regions.
- Longer, warmer springs and summers could improve revegetation initiatives and increase biomass carbon absorption.<sup>21</sup>

## 2.2 TRANSITION RISKS AND OPPORTUNITIES

Transition risks arise due to adjustments in policy and regulation, improvements in technology, and market and reputational shifts.

### 2.2.1 ADJUSTMENTS TO POLICY AND REGULATION

There has been a global shift towards increased levels of climate-related regulation. Traversing these emerging regulations can present significant transition risks for the mining sector. There has been a marked elevation in the dialogue and activity around net-zero requiring more accuracy in metrics and targets and greater transparency in company development in those areas.<sup>22</sup> These transformations precipitate regulatory amendments to ensure greater protection and high-quality standards in climate governance.

There are new climate-related disclosure requirements in key jurisdictions around the world. For major mining companies that operate globally, directors need to oversee and adapt to these regulatory requirements quickly and judiciously to avoid unwanted regulator and investor scrutiny, non-compliance investigations and fines, or reputational damage.

The European Union (EU) and the United Kingdom (UK) have made material changes to disclosure requirements that have a substantial impact on many mining companies and how they report on climate-related considerations. The UK's mandatory climate-related financial disclosure requirements by public companies, large private companies, and limited liability partnerships (LLPs) introduced the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022<sup>23</sup> and the Limited Liability Partnerships (Climate-related Financial Disclosure) Regulations 2022<sup>24</sup> and took effect in April 2022.<sup>25</sup>

The EU introduced the final text of its European Sustainability Reporting Standards (ESRS) in July 2023 through the *Delegated Regulation (EU) 2023/2772*.<sup>26</sup> These standards will require all large and

most listed companies to disclose comprehensively in the 2024 reporting period. These standards are unique in that they have introduced the concept of double materiality (reporting on considerations material to the company's impact on people and the environment, and considerations material to the financial well-being of the company) and the requirement for companies to report across its value chain.<sup>27</sup> Importantly, non-EU companies with a significant presence in Europe, including mining companies, will need to report on their 2028 financial year and the report must comprise the entire corporate group. The ESRS is expected to affect over 10,000 non-EU companies with 13% of them based in Canada.<sup>28</sup>

The EU and UK requirements have had a large influence on the changes in reporting requirements introduced in Canada and the United States (US), although many would argue that these new reporting requirements in Canada and the US are minor and do not go far enough fast enough. The chief modification to reporting requirements in Canada is through the introduction of the Canadian Securities Administrators' (CSA) proposed National Instrument 51-107 Climate-related Disclosures (NI 51-107), which requires TCFD-aligned climate-related disclosures for reporting issuers that will be discussed in further detail in Section 4.<sup>29</sup> In the US, the SEC's climate-related disclosure rules for registrants are due to come into force in April 2024.<sup>30</sup> However, on 4 April 2024, the SEC issued a voluntary stay on its climate-related rules pending judicial review by the US Court of Appeals for the Eighth Circuit.<sup>31</sup> Numerous separate legal challenges brought against the SEC by companies, US states, and non-government organizations in different circuit courts have been consolidated.<sup>32</sup>

Regulation changes are not only disclosure-centric. The 2050 Chilean National Mining Policy decrees that the total amount of water used in all copper production cannot constitute more than 10% of continental water. Other drought-affected regions will likely implement analogous constraints on water usage in the mining sector.<sup>33</sup>

These adjustments to policy and regulation can produce a litany of opportunities for quick and decisive directors. Taking the initiative on regulatory requirements means getting ahead of the curve in key areas, whilst honest and meaningful disclosures on climate-related considerations can generate openings for mining companies to acquire green premiums and beneficial incentives and evade infringements that could be expensive.<sup>34</sup>

### **2.2.2 MARKET AND REPUTATIONAL SHIFTS**

There is a distinct move for investors and the public towards a more environmental and social focus with expectations that companies will do more to mitigate climate change. Genuine efforts in increasing sustainable practices can go a long way in enhancing public perceptions.

The Canadian public has had a more positive perception of the mining sector in recent years. In a 2022 poll, 80% of respondents had a positive feeling towards Canadian metals and mineral

producers;<sup>35</sup> 88% have a more positive impression of the Canadian mining sector upon learning about the specific TSM standards that mining companies adhere to;<sup>36</sup> 83% support mining projects when they are accompanied by a clear plan on reducing GHG emissions;<sup>37</sup> and, for the first time in 12 years of polling, more Canadians perceive mining as the solution to climate change (52%) rather than contributing to it (48%).<sup>38</sup>

However, companies may have a more difficult time convincing investors who are more conscious of the risks climate change poses to their investments. To protect their investments, investors are requiring more robust climate governance from the directors of the companies in which they invest. Therefore, access to capital will increasingly be contingent on meeting ESG and climate-related targets along with clearer, more comprehensive, and accurate disclosures on climate-related risks, data, targets, and strategies.<sup>39</sup>

In EY’s annual survey on the risks most important to investors in the global mining sector, the top four in 2024 were local community impact, tailings and water management, water stewardship, and attaining net-zero emissions.<sup>40</sup>

**FIGURE 2: ESG FACTORS FACING THE MOST SCRUTINY FROM INVESTORS IN 2024\***



\*Respondents could choose more than one option  
 Source: Paul Mitchell, Top 10 business risks and opportunities for mining and metals in 2024 (EY, 2023) at 5.

**2.2.2.1 LOCAL COMMUNITY IMPACTS**

Mining sites are often located near or on Indigenous lands. Research by the University of Queensland’s Sustainable Minerals Institute has established that 54% of the 5,097 energy transition minerals and metals (ETMs) projects analyzed are on or near Indigenous Peoples’ land.<sup>41</sup> Mining operations seeking to capitalize on the increased demand for these ETMs may face significant risks to their reputation and subsequently to their equity financing.

There are everchanging expectations on the mining sector to have greater consideration for the impact their operations have on the local environment and the communities that rely on it. Mining companies are facing challenges in acquiring and retaining LTOs. Companies that do not take the requisite action to respect and protect the local environment for communities end up party to irreversible destruction, and consequently, damage their brand and reputation.<sup>42</sup> In Western Australia,

Rio Tinto in the expansion of an iron ore mine in 2020 destroyed two sacred caves eliminating 46,000 years of the Puutu Kunti Kurrama and Pinikura People's heritage.<sup>43</sup>

Consequently, local communities and Indigenous Peoples have little trust in mining companies to do right by them, and the area in which they live. Mining companies have a long way to go in earning trust. Local Indigenous communities have a greater say in project approval on and around their land and a lack of trust will hinder the procurement of LTOs which can scupper or delay operations impacting investor perceptions and access to capital.<sup>44</sup>

### 2.2.2.2 TAILINGS MANAGEMENT

Effective tailings management demonstrates to investors, local communities, and the public that the mining operations of the company are being well governed.<sup>45</sup> At present, there are over 200 billion tonnes of tailings globally with that expected to rise by approximately 25% in the next five years.<sup>46</sup> With investors placing higher priority on mining companies to manage these tailings effectively, there is a substantial risk to market and reputational risks if a mining company does not get it right.

Tailings storage facilities not only inhibit further use of that land by local communities, but failures in adequate management of tailings can devastate local communities. In British Columbia (BC), the 2014 failure of Mount Polley's gold and copper mine tailing storage resulted in 24 million cubic metres of slurry being emptied into local creeks and lakes raising the water levels by 1.5 meters. This resulted in damage to the ecosystem and habitats on which the local Indigenous population relied.<sup>47</sup> Such disasters can have severe long-term impacts on the environment, community, and the reputation of mining companies.

Another major concern shifting investor focus is the scarcity of space and water required for effective tailings management, with 55% of respondents recognizing that tailings management would be an investor priority in 2024 compared to 5% the year before.<sup>48</sup> More tailings dams have been built in the past decade than ever before,<sup>49</sup> however, water shortages pose a dire risk in the continued management of tailings dams. Dry stack tailings pose substantial challenges around filtration energy consumption and greater concern about failures that could lead to the destruction of the local environment and communities.<sup>50</sup>

### 2.2.2.3 WATER STEWARDSHIP

Water shortages are not just a concern with regard to tailings management but in a multiplicity of mining sector operations. With the increased threat of droughts looming, investors have notably shifted their attention towards how the mining industry is preparing for water scarcity now and in the future.<sup>51</sup> The discussion around water also extends to caring for local communities and the environment by ensuring that local water sources are not expended or contaminated by mining



operations,<sup>52</sup> and that the ability to regenerate the mining site is not compromised by poor water management.<sup>53</sup>

Numerous mining companies have set targets and metrics on water usage and management and regularly report to investors on their progress towards those goals.<sup>54</sup> This increased transparency helps to mitigate the risks associated with changing market perceptions around water stewardship within the mining sector and individual companies. However, those targets often do not consider more nuanced areas of water stewardship and their potential to conflict with other targets. Many water-saving technologies are energy intensive, thus, although such technologies contribute towards a company's ability to report on positive progress towards targets in the water stewardship field, it will adversely impact the company's potential progress on emission or energy consumption targets.<sup>55</sup>

#### 2.2.2.4 NET-ZERO

The drive to net-zero is well underway and investors and the public expect companies to play their part in reducing emissions. Mining companies have set their targets for achieving net-zero and failure to achieve important decarbonization milestones could pose significant reputational and investor risk for the sector.<sup>56</sup> This is exacerbated by the difficulties posed by mining companies in demonstrating their progress towards net-zero targets and that their low-carbon initiatives directly translate into lower emissions.

The energy transition is a crucial part of the move to net-zero, and this can pose significant investor risks as well. Investors are putting greater pressure on mining companies to divest themselves of coal-related assets and activities. Glencore faced a rejection of its climate progress report by 30% of its investors on May 26, 2023. A substantial issue was its thermal coal operations and a lack of demonstrable willingness to close those operations.<sup>57</sup> As a consequence of investor pressure, many mines have shed their coal sites and sought out alternatives to coal power in their mining and processing operations,<sup>58</sup> others—such as Rio Tinto—have departed from coal production entirely.<sup>59</sup>

Investors want to see a return on their investment. The energy transition is likely to increase costs to the mining sector, and slash profits;<sup>60</sup> however, to fail to transition could be even more costly. Since 2013, financial institutions have refused to invest in thermal coal projects.<sup>61</sup> In 2021, HSBC released its thermal coal phase-out policy stating that it will no longer finance thermal coal-related clients and projects in the Organization for the Economic Co-operation and Development (OECD) and EU countries by 2030 and the rest of the world by 2040.<sup>62</sup> Standard Chartered Bank announced in 2022 that it will cease to provide capital to mining and power companies whose entire income is dependent on thermal coal activities.<sup>63</sup> However, the most significant shift in the energy transition is the G7's announcement to terminate all government investment into thermal coal power generation projects by the of 2021.<sup>64</sup> The withdrawal of bank and government investment is a substantial risk to mining companies.

### 2.2.3 TECHNOLOGICAL ADAPTATION

Technological adaptation forms an important part of the necessary energy transition to achieve net-zero. With new technologies and innovations come risks for any sector, but the mining sector especially. New technologies developed for reducing water usage, through water recycling and reuse, dry processing technologies, alternatives to evaporation cooling systems, or the coarse particle recovery process<sup>65</sup> can have drawbacks in the level of energy it uses, thus negating their benefits to the climate. The coarse particle recovery process can save up to 30% in water and reduce the risks inherent in wet tailings;<sup>66</sup> however, this can create dry stack tailing, which poses alternative challenges to tailings-related disaster management.<sup>67</sup> There are challenges and risks involved with new energy sources as well. Hydrogen as a fuel source is not yet free of troubles, as demonstrated by the delayed Artemis 1 test flight.<sup>68</sup> The challenges introduced by the implementation of this innovative source of energy in mining operations, could, at best, delay the extraction and processing of metals and minerals should things go wrong.<sup>69</sup>

There are, of course, more technological advances currently being trialled within the mining sector, and these are discussed in more detail in Section 6. For mining companies who are proactively seeking solutions to present climate-related issues and who invest in the right climate-related technologies, there can be substantial opportunities to gain a competitive advantage in reputational capital, long-term sustainability, and the mining and processing of critical climate-related metals and minerals.



### 3. STATUTORY DUTIES OF DIRECTORS AND OFFICERS OF MINING COMPANIES

The directors of Canadian mining companies have statutory duties to the company they serve. Fiduciary duties and the duty of care are distinct duties under Canadian corporate governance.

#### 3.1 FIDUCIARY DUTIES

The fiduciary duty is a duty of loyalty to the company that ensures certain standards of behaviour on the part of the directors in discharging their duty. The primary focus of directors must be to work in the best interests of the corporation they serve with honesty and in good faith.<sup>70</sup>

The Supreme Court of Canada held in *BCE Inc v 1976 Debentureholders* that it is appropriate for directors to consider “the interests of, inter alia, shareholders, employees, creditors, consumers, governments and the environment”<sup>71</sup> when determining what decisions and actions are in the best interest of the company over the short and long term.<sup>72</sup> The 2019 amendment to the *Canada Business*

*Corporations Act (CBCA)* reflects the decision in *BCE Inc v 1976 Debentureholders* by stipulating that directors may consider the environment when discharging their fiduciary duties.<sup>73</sup> Therefore, the directors of Canadian mining companies will need to consider the long-term impacts of climate change on their company's viability and future success.

### 3.2 DUTY OF CARE

The duty of care sets an objective standard necessitating directors "to exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances."<sup>74</sup> The standard of behaviour is measured according to what "should be reasonably expected" having regard for all the circumstances and whether the directors were "reasonably informed".<sup>75</sup>

Therefore, directors should proactively seek to ensure they are fully informed on all material issues pertinent to the company they serve, which includes climate-related risks and opportunities. A reasonably prudent director would reasonably be expected to know and understand climate-related considerations and take the necessary action to address those considerations through short-, medium-, and long-term strategies.<sup>76</sup>



## 4. CURRENT AND PROPOSED FUTURE OBLIGATIONS UNDER CANADIAN SECURITIES LAW AND ACCOUNTING STANDARDS

There is a substantial drive to improve climate-related disclosures. Mining companies that are cognizant of these developments and take the initiative in their reporting could reap substantial benefits. The sub-sections below will provide an overview of the obligations required by Canadian securities law and accounting standards with a brief discussion of the changes that can be expected through NI 51-107 and the International Financial Reporting Standards (IFRS).

### 4.1 SECURITIES LAW

The CSA has declared climate-related risk a mainstream business concern.<sup>77</sup> Therefore, publicly listed Canadian mining companies are required to disclose all material climate-related risks and their management and mitigation.<sup>78</sup> Such disclosures should include how any environmental sustainability policies will affect their market competitiveness, current and future capital expenditures, what steps

they are taking to implement such policies, and any violations of federal environmental law. Failure to adequately disclose climate-related risks will expose the directors and the company to liability.<sup>79</sup>

The disclosure of climate-related risk under securities law is required within the Annual Information Form (AIF) and the Management's Discussion and Analysis (MD&A) forms.<sup>80</sup> The eventual enforcement of proposed NI 51-107 will level up existing disclosure requirements under securities law.<sup>81</sup> Specifically, the AIF and MD&A will need to include more detailed disclosure of:

- The board's oversight of climate-related risks and opportunities.
- The management's assessment and management of climate-related risks and opportunities.
- The company's processes in identifying and managing climate-related risks and opportunities.
- How those processes are integrated into the company's overall risk assessment.
- The short-, medium-, and long-term climate-related risks and opportunities the company has identified and the impact they will have on the company's strategies and financial projections.
- The metrics and targets used and set by the company and the outcomes of those targets.
- The company's scope 1, 2, and 3 emissions or an explanation for non-disclosure.
- Whether the company used the GHG Protocol to calculate their GHG emissions and if not, how their reporting standard is equivalent.<sup>82</sup>

For a more in-depth discussion on the disclosure requirements due under the Proposed NI 51-107, please see *A Guide to Effective Climate Governance for TSX Venture Issuers in the Mining Sector*.<sup>83</sup> The implementation of NI 51-107 has been delayed for two years, but various organizations are pushing for its enactment.<sup>84</sup>

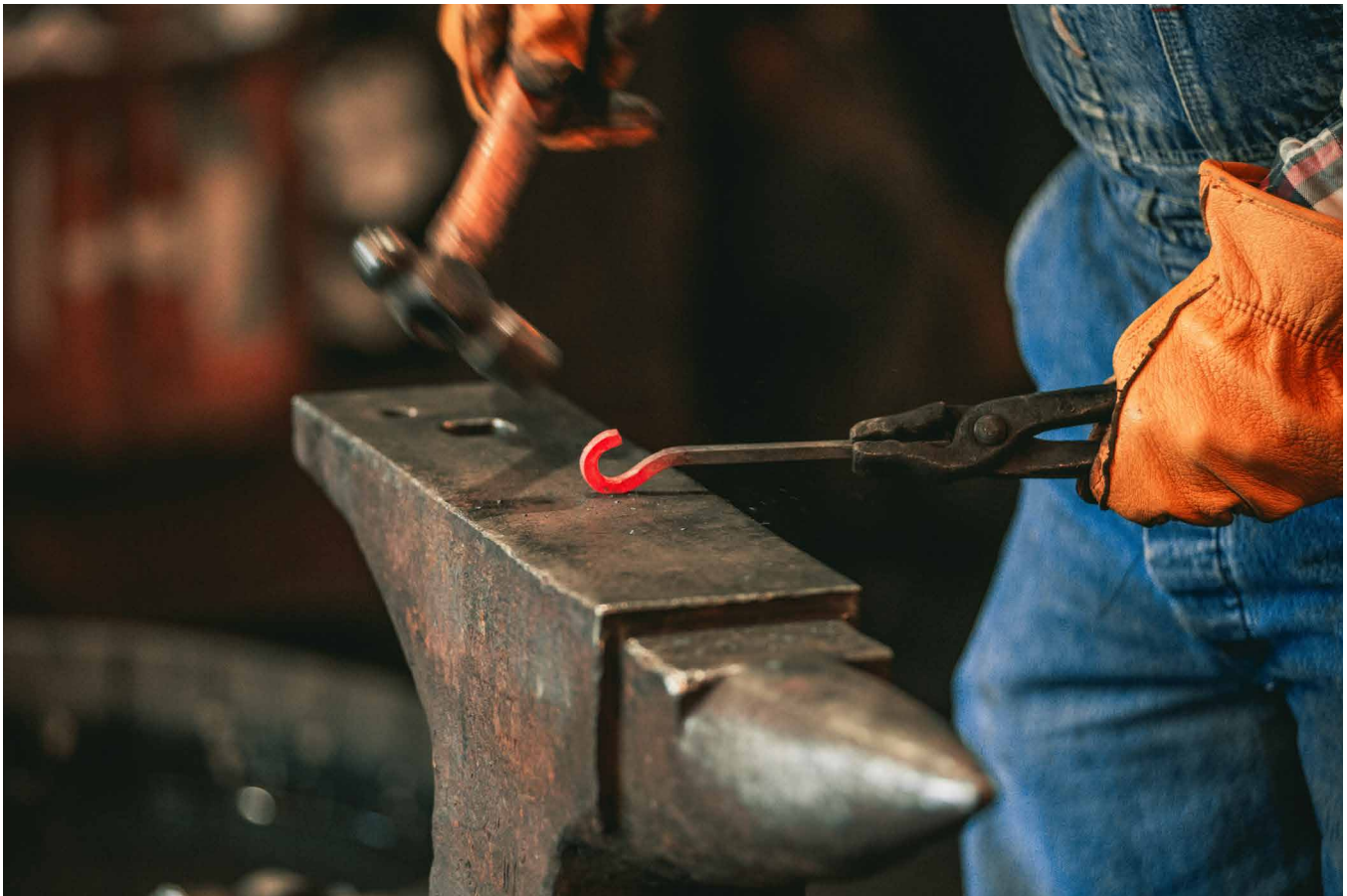
## 4.2 ACCOUNTING STANDARDS

The Canadian Accounting Standards Board (AcSB) expects that all interim and annual financial statements of all publicly accountable enterprises (PAE) will be prepared using the IFRS standards.<sup>85</sup> The IFRS standards are pertinent to climate-related disclosure. The International Sustainability Standards Board (ISSB) has expressly stated that companies using the standards are expected to "consider climate-related matters in applying IFRS Standards when the effects of those matters is material".<sup>86</sup>

As of June 2023, the IFRS has issued their landmark disclosure standards, IFRS S1 General Sustainability-related Disclosures (IFRS S1) and IFRS S2 Climate-related Disclosures (IFRS S2) in an attempt to provide a global standard in climate-related disclosures.<sup>87</sup> These standards are TCFD-aligned and are being adopted globally as of January 2024. The TCFD, having fulfilled its remit was disbanded in October 2023 with the IFRS taking on the role of monitoring climate-related disclosures going forward.<sup>88</sup> Thus, both the IFRS S1 and S2 are based on the four core TCFD principles of governance, strategy, risk management, and targets and metrics. They are very similar in that they

require companies to disclose all material information that could reasonably impact the company's short-, medium-, and long-term financial outlook such as access to capital and cash flow projections. The main difference is that IFRS S1 is focused on sustainability-related risks and opportunities,<sup>89</sup> whilst IFRS S2 is focused on climate-related risks and opportunities.<sup>90</sup>

In Canada, the Canadian Sustainability Standards Board (CSSB) has begun consultation on the release of its first proposed Canadian Sustainability Disclosure Standards; CSDS 1, General Requirements for Disclosure of Sustainability-related Financial Information (CSDS 1) and CSDS 2, Climate-related Disclosures (CSDS 2). The final standards are yet to be released; however, they will be aligned with IFRS S1 and S2 with minor adaptations to meet Canadian-specific needs.<sup>91</sup>



## **5. EFFECTIVE GOVERNANCE OF CLIMATE-RELATED FINANCIAL RISKS IN THE CANADIAN MINING SECTOR: WHAT SHOULD THE CANADIAN MINING SECTOR ALREADY BE DOING?**

Much of the discussion on effective climate governance in section 5 will be known to major mining companies through their current reporting using the TCFD Recommendations and TSM Climate Change Protocol.<sup>92</sup> The guidance provided is meant to serve as a brief reminder of the present obligations and to introduce the IFRS S2 expectations.

Each subsection will conclude with several key questions to guide directors of major mining companies in the assessment of their climate governance practices.

### **5.1 GOVERNANCE**

For effective climate governance to be appropriately demonstrated, mining companies should be able to provide details on the board and management's oversight of climate-related risks and opportunities



within the company.<sup>93</sup> Climate governance is essential at the board and management level to ensure there is accountability for climate-related considerations, certify that corporate decision-making is informed by material climate considerations, and promote a top-down approach to climate governance throughout the company and its operations.<sup>94</sup>

### ***Key questions:***

- Does the board have the requisite competencies to respond to climate-related considerations, and if not, how do they achieve those competencies?
- How often does the board receive updates from management on climate-related issues that affect the company?
- How does the board consider climate-related considerations when deciding the company's processes, strategies, transactions, policies, and risk management?
- How does the board set climate-related targets and monitor progress towards those targets?
- Is executive compensation aligned with performance of quantitative climate-related metrics?
- Does the board disclose their oversight and accountability of climate-related considerations?
- How does management play a role in the governance of climate-related considerations?
- Are management's policies and procedures for the supervision of climate-related considerations integrated into internal practices?
- How does the board oversee management's role in climate governance procedures and policies?
- Is there a process in place to promote the company's climate-related comments to employees and contractors?

## **5.2 STRATEGY**

Mining companies must have a well-designed and flexible strategy for managing climate-related risks and opportunities. To achieve this the board and management should have clarity on the climate-related physical and transition risks and opportunities that could impact the short- to long-term future of the company.<sup>95</sup> Such impacts should include the effects on the company's business model, value chain, strategy, transition plan, and current and future financial prospects and performance. An effective climate-related strategy will detail all risks and opportunities and their effects over the short, medium, and long term, and how resilient the strategy is to climate-related vicissitudes.<sup>96</sup>

### ***Key questions:***

- How does the strategy anticipate the effects of climate-related considerations on the company's prospects in the context of the business model, value chain, strategy, transition plan, and financial performance?
- How does the strategy detail the company's response to those climate-related impacts?
- How does the strategy detail the company's climate-related investment and divestment plans?
- How does the strategy contain qualitative and quantitative information on the progress made towards climate-related mitigation and adaptation plans?
- How does the strategy detail the company's resiliency to climate-related considerations using scenario analysis?
- How does the strategy account for any uncertainty in its assessment of climate-related risks and opportunities and the company's resilience?
- Is the strategy flexible enough to adapt to emerging climate-related risks and opportunities?
- Has the strategy been integrated into the company's normal business practices?
- Has the company adhered to its strategy by implementing climate-aligned mitigation and adaptation practices?

## **5.3 RISK MANAGEMENT**

Effective risk management starts with having operational procedures in place to identify, evaluate, prioritize, manage, monitor, and mitigate climate-related risks and opportunities. Ultimately, such operational procedures should include the use of scenario analysis in the identification of physical and transition risks. Mining companies must also be prepared to provide details on the scope of their operations covered in the scenario analysis and what data they used. A detailed breakdown into the prioritization, monitoring, and likelihood assessment of any identified risks and opportunities must also be considered.

### ***Key questions:***

- How are the risk management procedures integrated into and how do they inform the company's overall risk management?
- Does the board review the scenario analysis and its findings at set predetermined intervals?
- How do company facilities and sites consider the findings of the scenario analysis on relevant climate-related risks and opportunities in their decision-making processes?
- To what extent is the board confident that enough resources have been dedicated to the identification, assessment, management, monitoring, and mitigation of material climate -related risks and opportunities?

## **5.4 TARGETS AND METRICS**

Effective targets and metrics can facilitate the successful implementation and continuation of a mining company's climate-related risk management and strategy. Targets and metrics help to focus the company and its employees towards a common goal and demonstrate to investors that the company is informed, prepared, and committed to climate-related risks, opportunities, mitigation, and adaptation. To best benefit from these positives, targets should detail the metrics used to set the targets, the objective of the targets, the period over which the targets apply, any interim targets, and the areas of the company to which the target applies. Metrics should include scope 1, 2, and 3 GHG emissions measured using the GHG Protocol, internal carbon pricing and how the company utilizes it in assessing the cost of GHG emissions, and the extent to which climate-related considerations affect executive remuneration.

***Scope 1 emissions include direct emissions from a company's infrastructure.***

***Scope 2 emissions are indirect emissions from energy purchased.***

***Scope 3 emissions are indirect emissions originating from a company's value chain.***

### ***Key questions:***

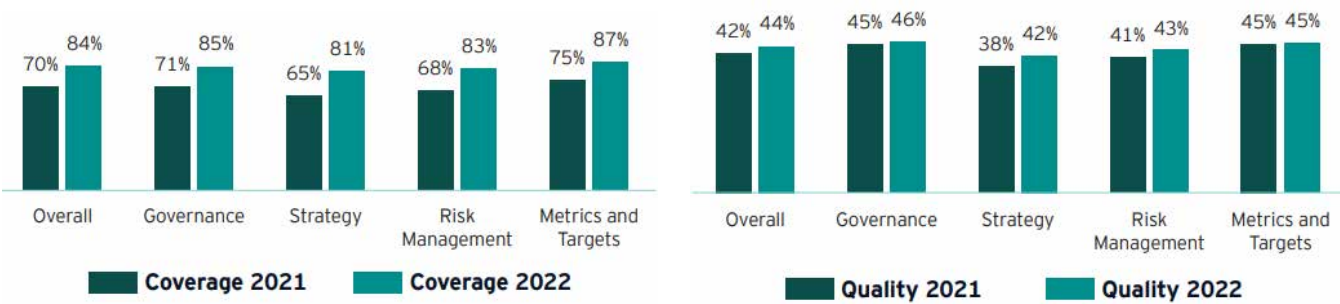
- Has the company set short-, medium-, and long-term targets to achieve net-zero by 2050?
- How does the board consider these targets when making decisions on future capital allocation?
- Do interim targets have realistic timescales and is their progress frequently assessed?
- Does the company have an energy use and GHG management system in place that includes applicable data collection and monitoring with integrated offsets across scope 1, 2, and 3 emissions?
- To what extent has the GHG management system been integrated into the entire business operation and has it undergone an internal and external audit?

## **5.5 DISCLOSURE**

Directors of mining companies have a duty to stay informed on developments in climate-related disclosures. As such it is incumbent on directors to familiarise themselves with the IFRS S1 and S2 standards and other relevant regulations. Companies are expected to use the IFRS standards for financial reporting as of January 2024 and directors who acquaint themselves with these standards will be well prepared for the release of Canada's IFRS-aligned Canadian Sustainability Disclosure Standards (CDSD) 1 and 2.

Disclosures should include reference to all the above effective governance requirements, so directors need to heed the climate-related considerations and developments being implemented in their companies and be fully cognizant of what they mean to deliver good-quality disclosures. Disclosure should not be treated as a "box-ticking" exercise, as investors can recognize these shortcomings. In 2022, EY found that whilst the extent of climate-related disclosures provided by the global mining sector was high across all key areas, the quality of disclosures was inadequate (see Figure 3 below).<sup>97</sup> Improving the quality and transparency of disclosures can increase investor confidence and help avoid accusations of greenwashing. This can go a long way in boosting the Canadian mining sector's reputation and help build better relationships with communities of interest.

### FIGURE 3: GLOBAL MINING SECTOR CLIMATE-RELATED DISCLOSURES (2021 & 2022) – QUANTITY VS QUALITY



Source: Matthew Bell, 2022 EY Global Climate Risk Barometer: When will climate disclosures impact decarbonization? (EY, 2022) at 7-8.

**Key questions:**

- Does the company disclose on all material information relevant to governance, strategy, risk management, and targets and metrics?
- Are disclosures done annually and are they independently verified?
- Are disclosures consistent and comparable from one year to the next and are any changes to reporting clearly delineated?
- Are targets and metric-related disclosures backed up with verifiable data?



## **6. ACCOMPLISHING MORE: WHAT NEXT STEPS IN EFFECTIVE CLIMATE GOVERNANCE SHOULD CANADIAN MINING COMPANIES BE INITIATING?**

Section 6 will take the idea of climate governance in the major mining sector to the next level, highlighting key areas where mining companies can develop their existing climate governance framework towards a more sustainable model. The MAC Guide to Climate Change Adaptation for the Mining Sector provides a detailed, step-by-step approach to improved targets and metrics, risk assessment, and adaptation initiatives for the mining sector.<sup>98</sup> Some specifics of the guide are detailed below.

### **6.1 MORE DETAILED TARGET-SETTING AND A CLEAR PLAN TO ACHIEVE THEM**

Although setting targets and metrics can be challenging, and measuring and reporting on the company's performance in terms of those targets can feel cumbersome, mining companies' efforts are not in vain. In a 2022 report on the performance of the global mining sector, there is a clear

demonstration that energy use and intensity, environmental expenditures, and GHG emissions improved over the period from 2011 to 2020. Specifically, GHG emissions decreased 0.9% from 2011 levels<sup>99</sup> and GHG emission intensity decreased annually by 4.0% on average.<sup>100</sup> This is a positive result considering the fact mining companies face more complications than other sectors in achieving net-zero emissions due, in part, to the fact that most mining sites experience higher emissions towards the end of the site's operations from deeper operations and deteriorating grade. This presents mining companies with a unique challenge when setting net-zero targets and demonstrating progress towards those targets.

Mining companies need to do more to demonstrate their commitment to the targets they have set by providing more minutiae on the interim targets and the comprehensive action plans they are using to attain their long-term goals. The targets set by companies should be specific and plans must acknowledge any plausible setbacks or trade-offs, such as the increased energy use in new water-saving technologies.<sup>101</sup> The focus should be given to data collection and processes to ensure the integrity of targets and their disclosure, as it is likely that they will be required to pass audit requirements in the future.

Most Canadian mining companies should already be measuring, monitoring, and reducing scope 1 and 2 emissions as a top priority. Many mines are installing renewable energy sources for their mining sites and upgrading their equipment to zero-carbon fuel alternatives.<sup>102</sup> In 2022, 52% of Anglo American's electricity came from renewable sources.<sup>103</sup> There has been enhanced investment in renewable sources since it has become cheaper. Rio Tinto and Glencore have established wind-generation facilities at some of their Canadian mines,<sup>104</sup> and IAMGOLD has built solar farms at their site in Suriname and Burkina Faso.<sup>105</sup> By investing in their own renewable energy sources these mines have secured a revenue source beyond the life of the mine.<sup>106</sup>

That is not to say the transition is easy as it can be challenging to negotiate for the right size of land and location on which to build these renewable energy facilities. Moreover, mines that do not develop their own renewable energy sources may find it difficult to access renewable energy at the scale needed for their operations.<sup>107</sup> Low-carbon equipment alternatives also pose obstacles for mining companies. Electric vehicles are costly, unreliable, and difficult to get serviced in remote jurisdictions, although there has been success in the use of battery-operated vehicles.<sup>108</sup> Newmont has replaced their underground diesel trucks at the Borden Gold project with battery-operated electric ones and is supplying other mining companies with battery-operated equipment.<sup>109</sup>

These initiatives are a fantastic start, but they are not enough to eliminate scope 1 and 2 emissions. Significant emissions remain in the ventilation, heating and cooling of mines, backup generators, and the processing and transportation of minerals and metals. Proactive action to address these additional sources of emissions in mining operations can be beneficial to mining companies seeking further equity investment.<sup>110</sup> There are already moves in the right direction: Rio Tinto and BHP Group

have announced their intention to purchase electric locomotives to haul their iron ore in western Australia;<sup>111</sup> Fortescue Metals is in the process of developing the “infinity train” which will use gravity to regenerate the electricity it needs to continue running, thus eliminating the need for recharging;<sup>112</sup> copper miner Oz Minerals is in the process of trialling an electrified diesel truck that can haul the same weight as a triple road train;<sup>113</sup> and Lundin Gold has implemented a ventilation-on-demand system that only supplies ventilation where needed reducing energy consumption and, consequently, their scope 2 emissions.<sup>114</sup>

Scope 3 emissions present the greatest challenges and opportunities for the Canadian mining sector. On the one hand, scope 3 emissions constitute the bulk of mining emissions (up to 95% for the mining of some commodities).<sup>115</sup> However, there is an advantage to be had for mining companies who take the initiative on the monitoring, management, and reduction of scope 3 emissions. They will not only achieve reputational gains with investors and the public but also acquire a competitive advantage. Very few International Council on Mining and Mineral (ICMM) members have set scope 3 emissions targets, despite collectively pledging to achieve net-zero by 2050 on scope 1 and 2 targets.<sup>116</sup>

Mining companies are actively exploring the possibilities of reducing scope 3 emissions through circular economy initiatives and more sustainable supply chains.<sup>117</sup> A lack of demonstrable data and unpredictability of the development and accessibility of low-carbon technology can make tackling the last of these emissions difficult.<sup>118</sup> The abatement of scope 3 emissions will require substantial operational changes to the mining sector with greater collaboration with clients, suppliers, and government agencies to ensure a panoramic view of the data across the value chain and mitigate against accusations of greenwashing.<sup>119</sup> Collaboration offers mining companies more accurate and complete data, an opportunity to foster a more carbon-neutral mindset throughout the value chain, and more comprehensible and consistent reporting to investors.

The preponderance of mining companies has committed to the net-zero target by 2050, however, research by EY demonstrates that many of those companies have not made the requisite investment to achieve that goal.<sup>120</sup> Adaptation initiatives can help mining companies achieve their net-zero targets and provide more clarity on where greater investment is needed.

Mining companies must not set unachievable targets as this could inhibit investor confidence. Many mining companies have admitted to having to reassess their decarbonization strategies due to problems in meeting their interim targets.<sup>121</sup> Companies should be clear on their action plans to achieve their goals.<sup>122</sup> Those action plans should be incorporated into the strategy of the company and actively overseen at the board level. Sharing the company’s strategic action plans for achieving their interim and end targets with investors helps to gain investor trust and demonstrates a thoughtful and calculated approach to decarbonization targets and metrics.<sup>123</sup>



For the mining sector, carbon capture and storage (CCS) is an essential tool to achieve net-zero emissions by 2050. Tailing site facilities of deposits usually contained in ultramafic rock, such as nickel, diamonds, and platinum-group elements (PGEs), offer an opportunity for CCS as they can absorb large amounts of carbon.<sup>125</sup> However, the use of CCS can be contentious as it extends the use of fossil fuels and creates opacity around the actual volumes of sequestered carbon, with some seeing it as a greenwashing exercise. Therefore, it is advised that mining companies use CCS sparingly and be prepared to provide detailed disclosures on their utilization. The same applies to carbon credits. Carbon credits can provide mining companies with flexibility in managing their emissions and reaching their net-zero targets, however, too much reliance on carbon credits may raise accusations of greenwashing. If mining companies use carbon credits, they must form part of a larger decarbonization action plan.<sup>126</sup> Therefore, both CSS and carbon credits should not form part of the main solution to a mining company's move to reduce GHG emissions and should only be used as a last resort.

### ***Key questions:***

- What capital and funding does the company have available to invest in achieving its targets? Is it sufficient?
- Does the board know what technology should be used to scale up and accelerate decarbonization? Is the technology accessible?
- How is the company measuring, monitoring, and communicating performance against these targets? Could the company provide more detail about its targets and action plan?
- How does the company determine its strategies to use technology and data to improve climate-related target and metric monitoring and measurement across the value chain—particularly areas subject to greater investor scrutiny, including water stewardship and tailings management?

## **6.2 DATA COLLECTION AND MEASUREMENTS**

Comprehensive data collection and monitoring of climate-related targets and metrics is one of the chief challenges for companies in all sectors of the economy. Companies must establish a credible baseline against which any progress can be measured. The baseline forms the foundation for reliable and comparable reporting on targets and metrics and provides trust and assurance to investors that the company's target-relevant action plan is viable. Investors expect more quantitative evidence of climate-related performances throughout the life of the mine.<sup>127</sup> This can be difficult to obtain, especially scope 3 upward and downstream value chain emissions. Smaller partners, clients, and

suppliers may not have that information in place which can hinder a mining company's ability to adequately disclose. Financial limitations can also be a barrier to accessing and gathering reliable data. However, these challenges must be overcome if mining companies are to avoid reputational damage through incorrect and insufficient data leading to poor quality disclosures.

One possible avenue to better data for mining companies is the Natural Capital Accounting for the Mining Sector: Beenup Site Pilot Case Study.<sup>128</sup> Natural Capital Accounting (NCA) "is an environmental accounting framework that provides a systematic way of measuring and reporting on natural capital assets (stocks) and ecosystem services (flows)."<sup>129</sup> Although the case study was focused towards the rehabilitation of a closed mining site, it does offer some possibilities for measuring the environmental impacts of mining which can be adapted to an operational site.

Ultimately, no matter what course a mining company takes towards retrieving better climate-related data, it is crucial that the board of directors has oversight and is actively engaged in the process. The board must understand how the data is collected, what the data limitations are, and be ready to support the implementation of strategic plans to overcome those limitations in the future. Moreover, when disclosing that data, the board should ensure that the necessary audits have been conducted and that any limitations are openly divulged to investors.<sup>130</sup>

### ***Key questions:***

- Is the board aware of the data limitation in the disclosure of the company's targets and metrics?
- Does the company have a strategic plan to overcome data limitations?
- Does the disclosure of data include quantitative and verifiable information?
- Does the data cover the life of all the company's mining sites?
- Has the company set a reasonable baseline from which target progress can be measured?

## **6.3 ADAPTATION INITIATIVES**

Due to the diversity of mining operations, adaptation initiatives will vary depending on the metal or mineral being extracted and produced, and the geography of the mining sites. Adaptation initiatives should be identified following an assessment of the climate-related risks and opportunities that affect the mining company and its sites. Reliable climate modelling to support climate-related

decision-making can be an obstacle for mining companies at present; however, adaptation measures should aim, wherever possible, to reduce current climate-related risks, benefit from current and future climate-related opportunities, and diminish the impact of future climate-related physical and transition risks.

To achieve this the board and senior management should engage with all adaptation ideas from employees at all levels of business. This will ensure that adaptation initiatives extend to all areas of risk within the business.<sup>131</sup> Some possible areas of adaptation for mining companies include:

- Recognizing the need for adaptation initiatives by incorporating climate-related considerations into the company's governance practices.
- Integrating climate-related adaptation initiatives into the company's risk management systems.
- Replacing or upgrading current infrastructure to increase climate resiliency, including power supplies, tailings management, transportation, and water systems.
- Constructing new infrastructure to deal with new climate-related challenges including water and tailing management systems and energy and power alternatives.
- Reviewing and adjusting mine closure plans to provide for long-term risks.
- Reviewing and adjusting observation and operation procedures to enhance the management of climate-related considerations. This can include:
  - Introducing better water stewardship to prepare for droughts and flood conditions.
  - Increasing the regularity with which debris is removed from culverts.
  - Incorporating the observation of climate-related considerations into risk and opportunity management practices to improve understanding and decision-making.
  - Employing protocols for the regular inspection of assets.
- Improving energy efficiency through renewable energy sources reducing fuel consumption.
- Cooperating with suppliers and clients on possible supply chain challenges and the strategic solutions that could be implemented to overcome them such as creating and implementing disaster response practices that respond to extreme weather events throughout the value chain.
- Connecting with third parties, such as regulators, experts, insurance companies, COIs, and investors to ensure adaptation initiatives are viable options for reducing risks.<sup>132</sup>

Of particular focus is water stewardship and tailings which are not mutually exclusive. With water shortages a keen concern in the global mining sector, adaptive ways of managing water usage are essential. Similarly, the proper management of waste products from mining activities to prevent environmental disasters and water contamination has been a strong consideration for investors over the years.<sup>133</sup> In tackling these challenges, the first step is for boards to familiarize themselves with MAC's Tailings Management and Water Stewardship Protocols.<sup>134</sup> There has been an array of industry-led adaptation initiatives that reduce freshwater usage whilst managing waste products, eliminate contaminants from tailing sites that could leak into freshwater sources, and enhance the possibility of successful reclamation of end-of-life mining sites.

One initiative is transitioning from tailings ponds to dry stacking or burying waste. This could reduce the likelihood of wet tailings disasters and allow for the reuse of that water. BHP is currently trialling two technologies at Olympic Dam in Australia to assess the possibility of reusing waste facility decant liquor to eliminate the need to store them in tailings dams and ponds.<sup>135</sup> Moreover, BHP has switched to using desalinated water that is produced using 100% renewable sources at their Escondida site in Chile, preserving the precious groundwater.<sup>136</sup> Similarly, Anglo American is currently trialling the recovery of water from coarse particles in their waste facilities amounting to a 30% saving in water.<sup>137</sup> Suncor is implementing the Passive Aquatic Storage System (PASS) that uses chemicals to draw water out of their tailings for safe release into the environment. The treated tailings will then form part of the site's reclamation as water is introduced to the tailings creating an aquatic enclosure.<sup>138</sup>

The Mining Microbiome Analytics Platform (MMAP) project is a collaboration between the University of British Columbia, Teck Resources, Rio Tinto, the Centre for Excellence in Mining Innovation (CEMI), and others to identify, through genome sequencing, natural microbes that can replace chemicals during the extraction process and aid in the rehabilitation of the mine site after its closure.<sup>139</sup> Such microbes could allow for the further extraction of copper from slag heaps and prevent toxic levels of selenium from entering the water system from mine waste.<sup>140</sup> The Giant Mine Remediation Project is seeking to combat arsenic trioxide from leaking into the Great Slave Lake from frozen blocks of toxic slurry. The 237,000 tonnes of the arsenic-containing slurry were stored in underground chambers to freeze, however, the projected increase in temperature could result in the liquefaction of those frozen toxic blocks. The implementation of the Perpetual Care Plan will look to observe, monitor, and manage an adaptive plan to mitigate the release of toxins from the site.<sup>141</sup>

### ***Key questions:***

- Has the company built a flexible transition strategy with practical adaptation pathways?
- Is the board aware of current tailings management initiatives? How is the board involved in future developments to ensure tailings are managed better with greater consideration of the environmental impacts?
- Has the board familiarised itself with the TSM Tailings Management Protocol and has their company created an observation, operation, and maintenance manual of which the board is familiar?
- How is the board planning for closures to create a sustainable legacy beyond life of mine?
- Has the board familiarised itself with the TSM Water Stewardship Protocol? Has the company started adaptation initiatives to protect and preserve freshwater sources?

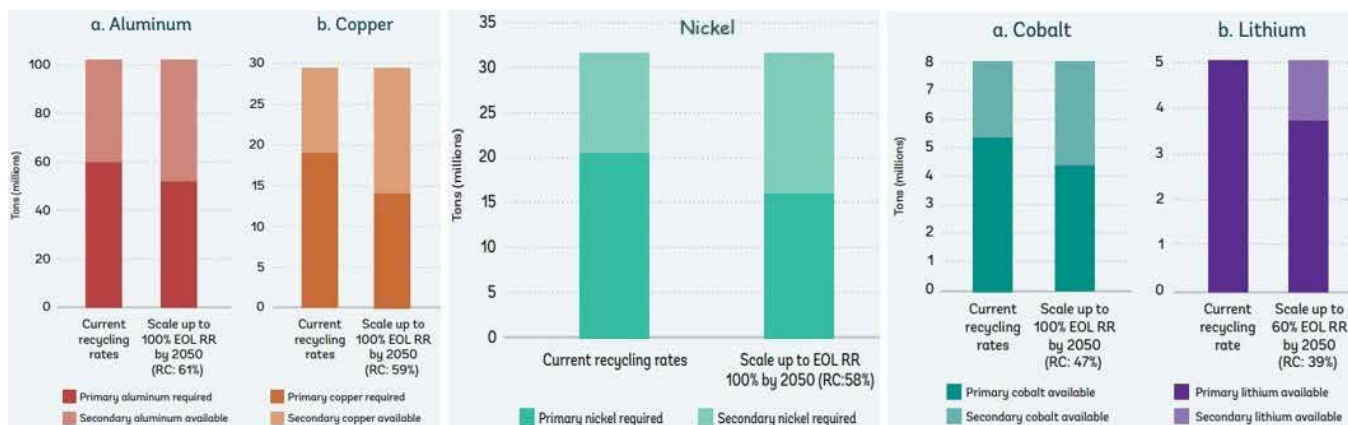
## 6.4 CIRCULAR ECONOMY

A circular economy converts linear operations into circular operations to minimize waste, reduce emissions, and maximize value through by-products created from waste that would normally be disposed of. Circular operations can take the form of the recycling—i.e. the collection and recovery of minerals and metals through various processes—of mining waste (such as slurry and tailings), retrieval and reuse of manufactured waste, and the recycling of minerals and metals from end-of-life (EOL) products.<sup>142</sup> The circular economy requires mining companies to look at possibilities internally and along the value chain. By focusing on the value chain, mining companies can take ownership of their metals and minerals throughout their life. This has reputational and financial benefits as companies that can demonstrate engagement in the circular economy on a value-chain scale will gain a front-runner advantage.<sup>143</sup> Glencore has this advantage already. They have been processing and recycling electronic and battery waste for the past 30 years and now seek to test the recycling of more complex materials.<sup>144</sup> Anglo American is moving in the right direction by trialling new chemicals on their tailings to help extract more minerals out of the mine's waste whilst further stabilizing the tailing facilities.<sup>145</sup>

By exploring how they can recycle, refurbish, repair, reuse, and repurpose existing infrastructure and waste products, mining companies have the opportunity to exploit the reputational benefits and capital gains that can arise from it.<sup>146</sup> BlackRock, in collaboration with the Ellen MacArthur Foundation, seeks to steer investment towards companies that are actively engaged in the circular economy.<sup>147</sup> Failure to implement circular economy initiatives could result in missed growth opportunities through greater investment and additional value from waste. For example, upcycled mining waste can be used as an additive for soil in the rehabilitation of mining sites, in the construction of roads, or by other companies to process other materials.<sup>148</sup> However, it would be incumbent on mining companies to check their waste first for unprocessed material as there is an estimated \$10 billion of gold remaining in Canadian gold mining waste.<sup>149</sup> Extracting minerals and metals from waste tailings can, therefore, increase the minerals extracted whilst reducing waste.

As metals and minerals are not completely depleted through use, there is the potential for them to be recycled several times. Consequently, the upscaling of mineral and metal recycling offers a secondary supply of these products contributing to greater security in the availability of critical minerals and metals whilst alleviating pressure on the virgin material supply.<sup>151</sup> However, even if the EOL recycling rates on minerals and metals were to reach 100%, the exploration and mining of new sources of minerals and metals will continue to need high levels of investment to meet demand.<sup>152</sup> Figure 4 demonstrates the demand for primary and secondary metals and minerals by 2050 if recycling rates were scaled up to 100%, thus emphasizing that recycling will not substantially impact the demand for primary materials.

## FIGURE 4: IMPACT OF RECYCLING ON DEMAND FOR PRIMARY METALS AND MINERALS BY 2050

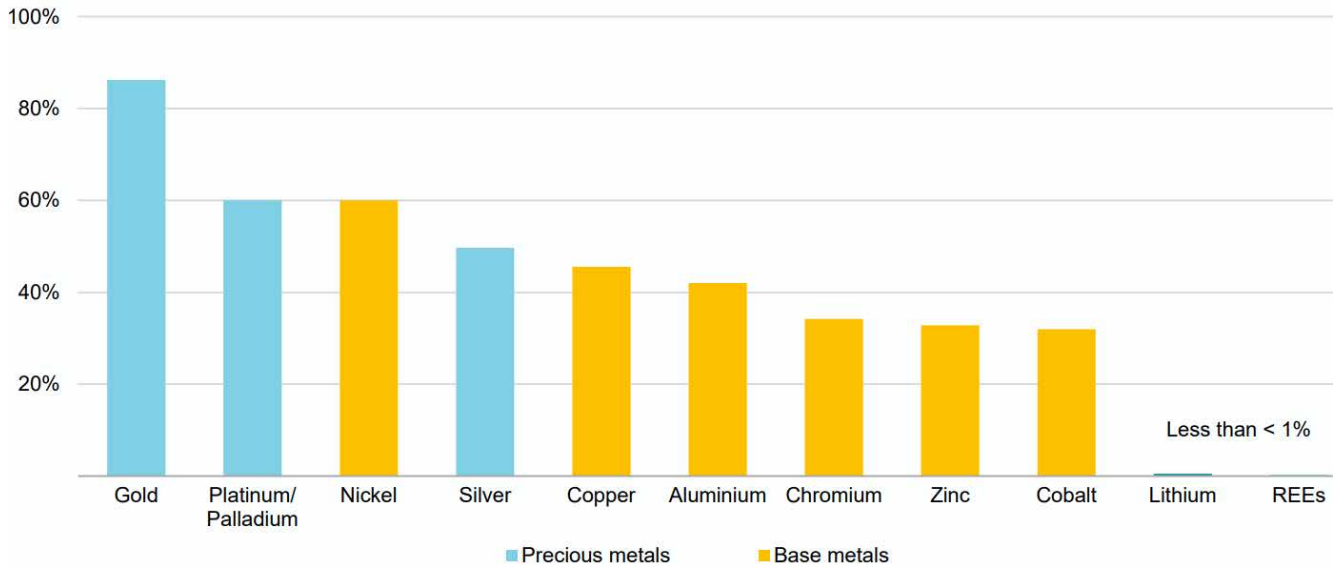


Source: Hund, Kirsten et al, Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition (Washington, DC: The World Bank, 2020) at 81-82.

Different metals and minerals present varying degrees of recycling opportunities and geography can play a large part in the ability and cost to recycle.<sup>153</sup> Established waste streams that contain widely used metals and minerals have proficient recycling processes. Figure 5 demonstrates that EOL recycle rates for base and precious metals are reasonably high. This is due to the past and present bulk use of base metals—making them easier to collect—and the high price of precious metals.<sup>154</sup> However, this is not the case with lithium and the rare earth elements (REEs) needed for clean energy technologies. This is expected to change with an influx of electric vehicle (EV) battery waste anticipated after 2030. The total battery waste from EVs sold in 2017 will amount to 250,000 tonnes.<sup>155</sup> By recycling the minerals and metals in these batteries, they could contribute a secondary supply of 10% of the nickel, lithium, cobalt, and copper required by the new battery market.<sup>156</sup>

It is worth noting here that the recycling rate of elements can be impacted by several factors. One is the possible recovery time due to the long-term nature of the infrastructure they are used in.<sup>157</sup> Another is the current recycling processes that are available. Certain recycling methods can deplete the level of the element, thus negating the time and money it would require to extract some elements. This is the current issue with extracting lithium from lithium-ion batteries.<sup>158</sup> Some elements are recyclable but not economically feasible to do so, due to the complexity of the recycling process required. For instance, to recycle new iron and copper alloy 50 different materials must be separated.<sup>15</sup>

**FIGURE 5: END-OF-LIFE RECYCLING RATES FOR SELECTED METALS**



Source: International Energy Agency, The Role of Critical Minerals in Clean Energy Transitions, World Energy Outlook Special Report (IEA, 2021) at 34.

Innovations in technology are perpetual and these challenges will be overcome in time.<sup>160</sup> There are several ways that the recycling of critical minerals and metals will improve. Analysis of global stocks of these elements is underway and this will provide a deeper understanding of secondary mineral stocks and demand.<sup>161</sup> Directors of mining companies should keep themselves constantly informed of any developments that can bring their firm into the circular economy of the future.

***Key questions:***

- Has the board actively explored the ways its mining company can get involved in the circular economy?
- Is the board regularly informed on new technologies in the recycling of mining waste?
- How cognizant is the board of the company’s value chain?
- Does the company take ownership of their metals and minerals throughout their lifecycle?

## 6.5 GREATER CONSIDERATION FOR LOCAL COMMUNITY IMPACTS

Mining companies must move beyond regulatory requirements in their efforts to build bridges. They must demonstrate through deeds and actions their commitment to fostering cultural awareness and advancing truth and reconciliation. Mining operations need to learn from past issues and demonstrate meaningful respect for the importance of the land to the people who reside there. However, it is also important that any consultations with Indigenous Peoples and local communities are sincere and that any concerns are appropriately heard and actioned.<sup>162</sup>

Mining companies need to take a two-pronged approach to community impact assessments. The first is the effect that ongoing operations have on local communities and the second is planning for the mine's closure in the future and ensuring that COIs receive a net benefit from the mine's presence.

### 6.5.1 ONGOING OPERATIONS

The principle of 'Free, Prior and Informed Consent' (FPIC) as recognized by the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) should inform mining companies' engagement with COIs. BC, home to over 800 major and junior mining companies,<sup>163</sup> is the first Canadian province to put UNDRIP into law with the *Declaration on the Rights of Indigenous Peoples Act*.<sup>164</sup> Often mining sites form part of the heritage of local Indigenous Peoples who have a deep connection and reliance on the land for their physical, economic, and spiritual wellbeing.<sup>165</sup> Consequently, FPIC instills a universal right to self-determination for Indigenous Peoples, which requires any proposed projects near or on their land to gain their express consent, and provides the Indigenous Peoples with the power to negotiate on the design, operation, observation, and evaluation specifications of those projects.<sup>166</sup>

There is a need for greater consultation and collaboration with COIs from the mine's nascency through to its termination. This can create value for the COIs and the mine. The traditional awareness and understanding that Indigenous Peoples have for the land indicates they can provide the mine with ample aid in designing, operating, and sustainably closing the mine. Indigenous Peoples can provide useful information on how to preserve the surrounding natural habitat and regenerate the mine site in the future.<sup>167</sup> South32 worked with the University of Wollongong researchers and the Illawarra Local Aboriginal Land Council to help restore the land on Mount Kembla using traditional Aboriginal knowledge of the land.<sup>168</sup>

Mining companies have the opportunity to assist COIs with the climate-related problems they face in the future, whether that is through renewable energy supplies or better water stewardship projects that enhance the freshwater supply in the surrounding area.<sup>169</sup> Mining companies can include COIs in the climate resilience and adaptation journey of the mine by sharing climate-related data with the community to aid in local preparation for weather events and plan emergency contingencies. Ideally,



the mine would work with COIs to ensure mutual survival over the long term by weathering climate-related risks together. To achieve this, mines need to be prepared to engage more meaningfully with COIs. This can help to avoid situations where a mining company's adaptation initiatives have a negative, unforeseen impact on the community. For example, adaptation to a mine's port facilities to better manage sea level rises and coastal erosion should engage the local community to ensure those adaptations do not increase local flooding, harm sea life, or create a hindrance to a community's access to the coast.<sup>170</sup>

The best way for mining companies to increase consultation and collaboration is by creating an impact framework based on stakeholder value that spans the entire value chain. This impact framework can help companies recognize, understand, and report on their Indigenous relations and the value they add to COIs.<sup>171</sup> This includes considering the impact mining operations have on air and water quality, noise and vibrations, and the long-term health of COIs.<sup>172</sup>

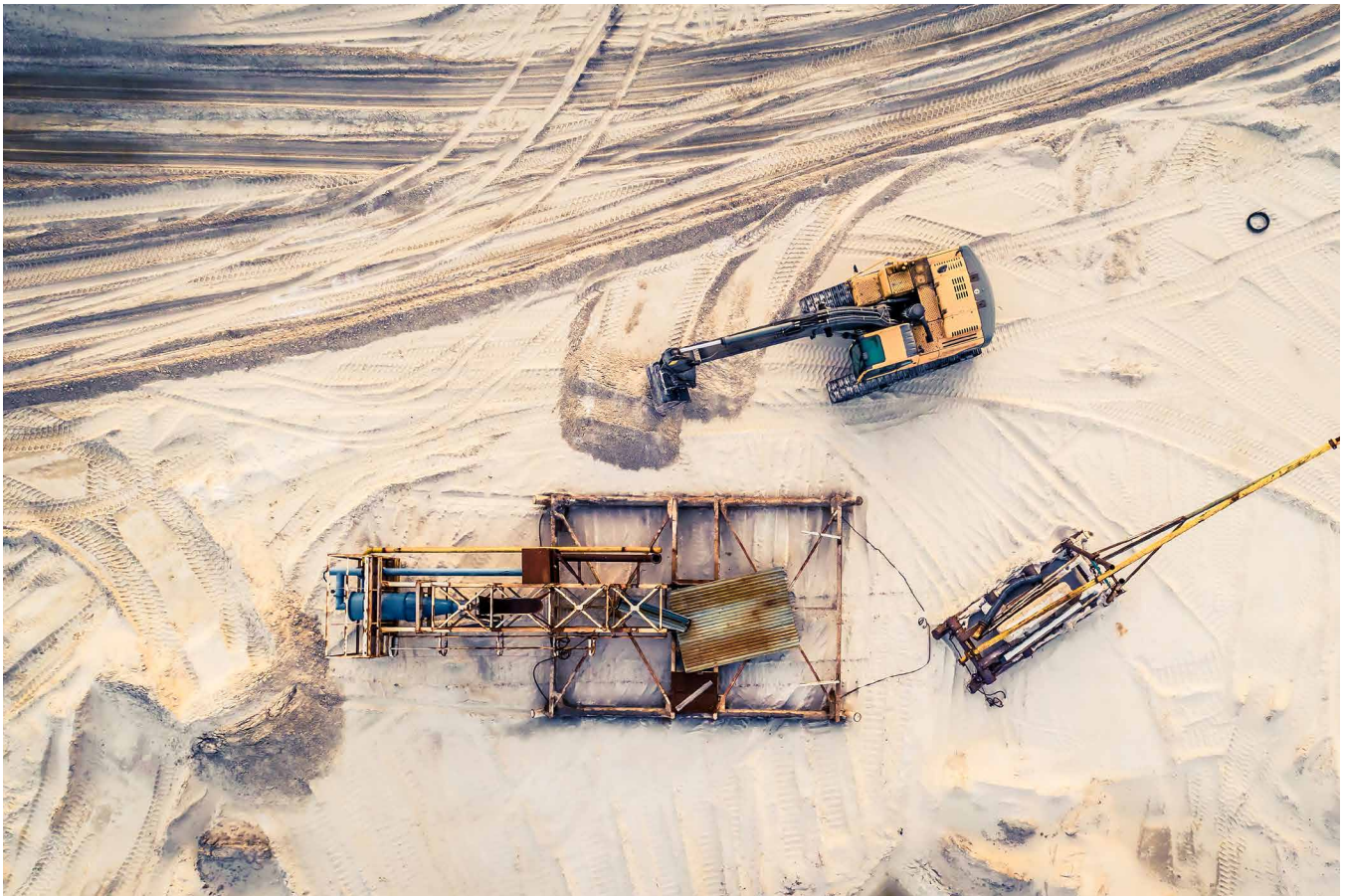
### 6.5.2 MINE CLOSURES

Mining companies should have full consideration for the closing of the mine at the advent of the project and ensure ongoing decisions are made with the impact on mine closure options in mind. At present, there are over 7,500 inactive mines in Canada, and that is excluding data from BC, Québec, and Yukon.<sup>173</sup> With just under half of those considered to be Class A, B, or C, there is the potential for substantial harm to the environment, and the health and safety of the public.<sup>174</sup> As part of this consideration, mining companies should incorporate climate change and engage with COIs to ensure that the mine leaves behind a constructive legacy upon closure that benefits the surrounding community over the long term.<sup>175</sup> The complexity of mine closures makes the consideration of repurposing and rehabilitating the environment an additional challenge; however, there is assistance to navigate this challenge. The Leadership in Sustainable Mine Closure Program formulated by the University of British Columbia in tandem with Rio Tinto, Curtin University, and EY provides a sound standard on what an effective mine closure should look like, including how it can be achieved, and variables that should inform the decision-making process on the closure of the mine throughout the value chain.<sup>176</sup>

A sound mine closure requires that the rehabilitated land be capable of supporting the use of that land with a low risk of pollution-related incidents. The Australian Department of Environment and Heritage Protection requires this risk to remain low for 30 years following the mine closure.<sup>177</sup> A mining company's ability to ensure land rehabilitation for such a length of time is inhibited by climate change. Climate change introduces uncertainty on extreme weather-related events and climatic fluctuations that could result in the rehabilitation's failure.<sup>178</sup>

### ***Key questions:***

- Is the company strategic plan aligned around a wider, stakeholder-driven agenda having consideration for COI, Indigenous Peoples and the reclamation of the land after mine closure?
- Does the company have an engagement plan that communicates the potential positive impact for COI, Indigenous Peoples and the reclamation of the land?
- Is the board aware of ongoing community engagement initiatives surrounding land use and reclamation and climate change adaptation?
- Is there a clear closure plan for all mines sites that informs the director's and management' decisions on all aspects of the mine's value chain?
- Does the company collaborate with Indigenous Peoples and the local community to improve the sustainability of their mining practices with the view of leaving a positive legacy once the mine closes?



## 7. CONCLUSION

Constituting 75% of the global mining companies,<sup>179</sup> Canadian mining companies are integral to the world's move towards renewable and sustainable technologies. With a world-leading program such as TSM, Canadian mining companies also have no excuse for not fulfilling the requirements of climate governance.

Major mining companies are facing a myriad of climate-related risks and opportunities that demand careful attention and proactive measures. The physical risks stemming from extreme weather events can disrupt operations, damage infrastructure, and jeopardize employee and community safety. Transition risks, including policy changes and market shifts, could lead to financial losses and reputational damage if not managed effectively.

Directors of these companies have a fiduciary duty to address these risks and opportunities with diligence, integrating climate strategies into their business operations, and ensuring compliance with

current and future climate-related regulations. This requires dependable board oversight, robust risk management, and transparent disclosure practices.

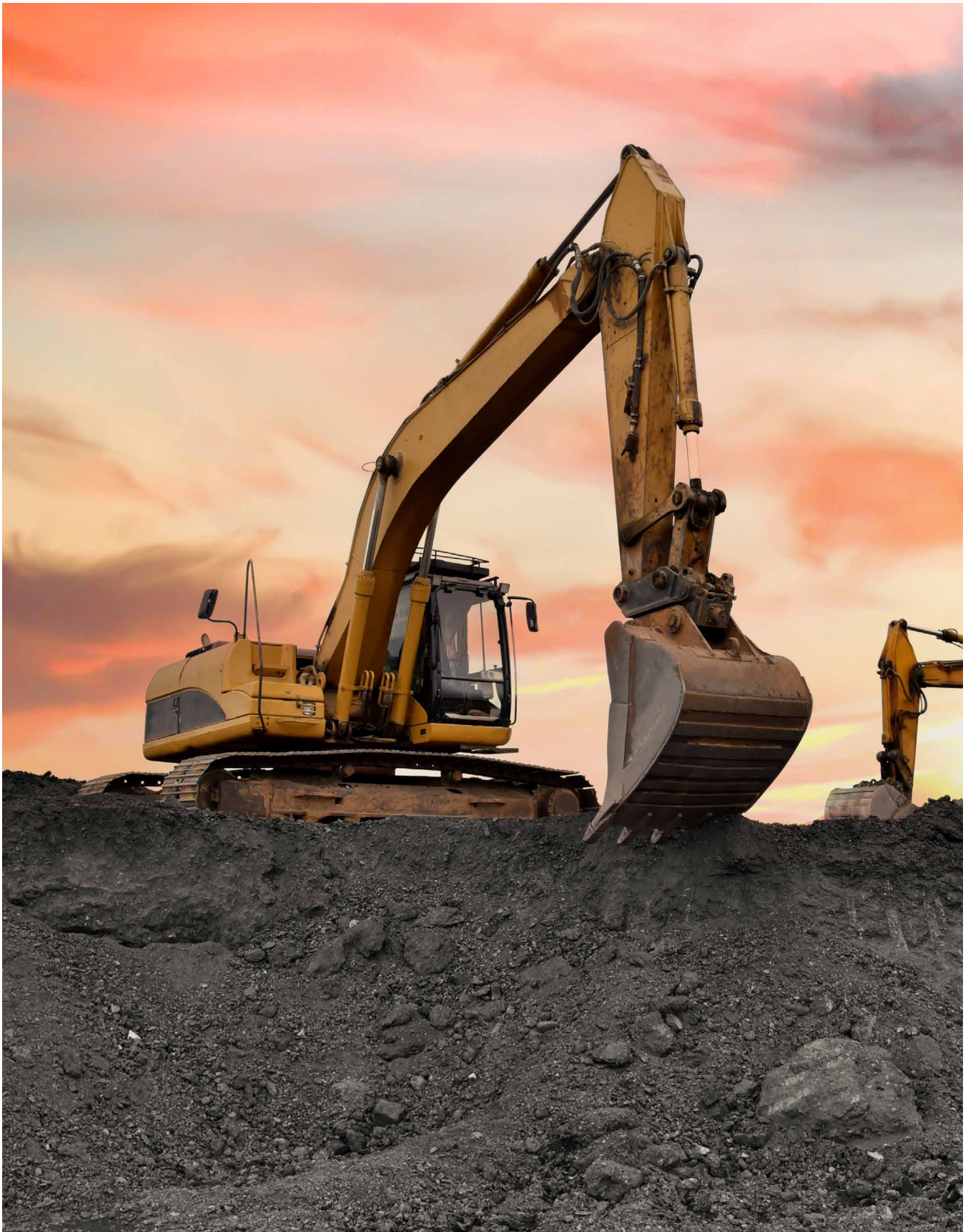
While many mining companies in Canada have already made strides in climate governance and sustainability, there is a need for continued progress. Five key areas for improvement have been identified:

1. **Target Setting and Achievement Plans:** Companies need to set detailed emission reduction targets, particularly for scope 1 and 2 emissions, and develop practical solutions to achieve them. Greater collaboration and investment will be necessary to address scope 3 emissions.
2. **Data Collection and Measurements:** Accurate data is essential for demonstrating progress towards targets. Mining companies must invest in technologies and initiatives to improve data collection and measurement processes.
3. **Adaptation Initiatives:** Investing in adaptation measures to mitigate physical and transition risks can yield long-term benefits, including reduced downtime and enhanced reputation. Initiatives such as water stewardship and tailings management are already underway.
4. **Circular Economy Involvement:** Embracing the circular economy can reduce reliance on virgin resources and provide opportunities for recycling and upcycling waste materials. This approach can help mining companies manage their materials throughout the value chain more effectively.
5. **Community Engagement:** Building strong relationships with local communities, particularly Indigenous Peoples, is crucial for ongoing operations and mine closures. Mining companies should prioritize building trust and collaborating with COIs, demonstrate respect for the land, and consider the impact of their operations on local communities.

Overall, major mining companies have the potential to achieve more in their journey towards net-zero and sustainability. By addressing these key areas for improvement, they can enhance their climate governance practices, minimize risks, and contribute positively to both their own success and the broader sustainability of the mining sector.

*The Canada Climate Law initiative offers free sector-specific presentations to boards and their senior executives that would like more information on regulatory changes and best practices.*

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