

The background of the entire page is an abstract composition of light gray and white geometric shapes, primarily triangles and quadrilaterals, arranged in a complex, overlapping pattern. These shapes create a sense of depth and perspective, resembling a modern architectural structure or a crystalline formation. The overall color palette is very light, with soft gradients of white and pale gray, giving it a clean, high-tech, and minimalist appearance.

27 JUNE 2022

**EXTRACTIVES & MINERALS PROCESSING**

# **METALS & MINING**

# Industry Sustainability Best Practices

## SASB GUIDELINES

# METALS & MINING

**T**he Metals & Mining industry is involved in extracting metals and minerals, producing ores, quarrying stones, smelting and manufacturing metals, refining metals, and providing mining support activities. It also produces iron ores, rare earth metals, and precious metals and stones. Larger companies in this industry are vertically integrated – from mining across global operations to wholesaling metals to customers.



# **DIFFERENT SUSTAINABILITY RISKS AND OPPORTUNITIES DIMENSIONS**

## **Greenhouse Gas Emissions**

Mining operations are energy-intensive and generate significant direct greenhouse gas (GHG) emissions, including carbon dioxide from fuel use during mining, ore processing, and smelting activities. The extent and type of GHG emissions can vary depending on the metal mined and processed. Regulatory efforts to reduce GHG emissions in response to the risks posed by climate change may result in additional regulatory compliance costs and risks for metals and mining companies due to climate change mitigation policies. Operational efficiencies can be achieved through the cost-effective reduction of GHG emissions. Such efficiencies can mitigate the potential financial impact of increased fuel costs from regulations that seek to limit—or put a price on—GHG emissions.

## **Air Quality**

Non-greenhouse gas (GHG) air emissions from the Metals & Mining industry include hazardous air pollutants, criteria air pollutants, and Volatile Organic Compounds (VOCs) from smelting and refining activities. These can have significant, localized human health and environmental impacts. Depending on the metal, uncaptured sulfur dioxide, lead, mercury, cadmium, and arsenic are among the chief pollutants, along

with particulate matter. Financial impacts resulting from air emissions will vary depending on the specific location of operations and the applicable air emissions regulations. Active management of the issue—through technological and process improvements—could allow companies to limit the impacts of increasingly stringent air quality regulations globally. Companies could also benefit from operational efficiencies that could lead to a lower cost structure over time.

## **Energy Management**

Mining and metals production is often energy-intensive, with a significant proportion of energy consumption in the industry accounted for by purchased electricity. While fuel combustion on-site contributes to the industry's direct (Scope 1) GHG emissions, electricity purchases from the grid can result in indirect, Scope 2 emissions. The energy intensity of operations may increase with decreasing grades of deposits and increasing depth and scale of mining operations. The choice between on-site versus grid-sourced electricity, and use of alternative energy, can play an important role in influencing both the costs and reliability of energy supply. Affordable and easily accessible energy is an important competitive factor in a commodity market driven by global competition, and purchased fuels and electricity can account for a significant proportion of total production costs. The way in which a company manages its overall energy efficiency and intensity, its reliance on different types of energy, and its ability to access alternative sources of energy, can therefore be a material factor.

## **Water Management**

Mining and metals production can impact both the availability and the quality of local water resources. Metals and mining companies face operational, regulatory, and reputational risks due to water scarcity, costs of water acquisition, regulations on effluents or amount of water used, and competition with local communities and other industries for limited water resources. Impacts associated with water management may include higher costs, liabilities, and lost revenues due to curtailment or suspension of operations. The severity of these risks can vary depending on the region's water availability and the regulatory environment. Companies in the industry may deploy new technologies to manage risks related to water risk, including desalination, water recirculation, and innovative waste-disposal solutions. Reducing water use and contamination can create operational efficiencies for companies and lower their operating costs.

## **Waste & Hazardous Materials Management**

The Metals & Mining industry generates large volumes of non-mineral and mineral waste, including waste rock, tailings, slurries, slags, sludges, smelting, and industrial wastes, some of which may contain substances that are toxic, hazardous, or chemically reactive. Mineral processing sometimes also requires the use of hazardous materials for metal extraction. Waste produced during mining operations, depending on its type, can be treated, disposed of, or stored on- or off-site in impoundments or old mine pits. Improper disposal or storage of

hazardous materials or mining waste can present a significant long-term threat to human health and ecosystems through potential contamination of groundwater or surface water that is used for drinking or agriculture purposes. Companies that reduce waste streams while implementing policies to manage risks related to handling hazardous materials may see lower regulatory and litigation risks, remediation liabilities, and costs.

## **Biodiversity Impacts**

The development, operation, closure, and remediation of mines can have a range of impacts on biodiversity, such as alterations of landscape, vegetation removal, and impacts to wildlife habitats. Acid rock drainage is a particularly significant risk: it is highly acidic water, rich in heavy metals, formed when surface and shallow subsurface water come into contact with mining overburden. Acid rock drainage can have harmful effects on humans, animals, and plants. Biodiversity impacts of mining operations can affect the valuation of reserves and create operational risks. The environmental characteristics of the land where reserves are located could increase extraction costs due to increasing interest in the protection of ecosystems. Companies could also face regulatory or reputational barriers to accessing reserves in ecologically sensitive areas. This may include new protection status afforded to areas where reserves are located. Metals and mining companies face regulatory risks related to reclamation after a mine is decommissioned, per applicable regulatory requirements to restore mined property according to a prior, approved reclamation plan. Material costs may arise from removing or

covering refuse piles, meeting water treatment obligations, and dismantling infrastructure at the end of life. Furthermore, ongoing mining operations are subject to laws protecting endangered species.

Companies that have an effective environmental management plan for different stages of the project lifecycle may minimize their compliance costs and legal liabilities, face less resistance in developing new mines, and avoid difficulties in obtaining permits, accessing reserves, and facing delays in project completion.

## **Security, Human Rights & Rights of Indigenous Peoples**

Metals and mining companies face additional community-related risks when operating in conflict zones and in areas with weak or absent governance institutions, rule of law, and legislation to protect human rights. They also face risks when operating in areas with vulnerable communities, such as indigenous peoples. Companies using private or government security forces to protect their workers and assets may knowingly, or unknowingly, contribute to human rights violations, including use of excessive force. Indigenous people are often the most vulnerable sections of the population, with limited capacity to defend their unique rights and interests. Companies perceived as contributing to human rights violations or failing to account for indigenous peoples' rights may be affected due to protests, riots, or suspension of permits. They could face substantial costs related to compensation or settlement payments, and write-downs in the value of their reserves in such areas. In the absence of country laws to address such cases, several

international instruments have emerged to provide guidelines for companies. These instruments include obtaining the free, prior, and informed consent of indigenous peoples for decisions affecting them. With greater awareness, several countries are also beginning to implement specific laws protecting indigenous peoples' rights, creating increasing regulatory risk for companies.

## **Community Relations**

Mining facilities are frequently active over long periods of time, and companies may be involved in multiple projects in a region that can have a wide range of community impacts. Community rights and interests may be affected through environmental and social impacts of mining operations, such as competition for access to local energy or water resources, air and water emissions, and waste from operations. Mining companies rely upon support from local communities to be able to obtain permits and leases as well as to conduct their activities without disruptions. Companies may experience adverse financial impacts if the community interferes, or lobbies its government to interfere, with the rights of a mining company in relation to their ability to access, develop, and produce reserves. In addition to community concerns about direct impacts of projects, the presence of mining activities may give rise to associated socio-economic concerns, such as education, health, livelihoods, and food security for the community. Metals and mining companies that are perceived as engaging in rent-seeking and exploiting a country or community's resources without providing any socio-

economic benefits in return may be exposed to the risk of actions, motivated by resource nationalism, and by host governments and communities. These could include imposition of ad hoc taxes and export restrictions. Companies in the extractives industries can adopt various community engagement strategies in their global operations to manage risks and opportunities associated with community rights and interests. Strategies are often underpinned by the integration of community engagement into phases of the project cycle. Companies are beginning to adopt a “shared value” approach to provide a key socio-economic benefit to the community while allowing the company to profitably operate.

## **Labor Relations**

Metals and mining companies face inherent tension between the need to lower the cost of labor to remain price competitive, and to manage human resources to ensure long-term performance. Working conditions related to metal and mining operations are usually physically demanding and hazardous. Labor unions play a key role in representing workers’ interests and managing collective bargaining for better wages and working conditions. At the same time, metals and mining companies often operate in areas where worker rights are not adequately protected. The nuances of both domestic and international worker concerns make management of labor relations critical for metals and mining companies. Conflict with workers can result in labor strikes and other disruptions that can delay or stop production. Work stoppages frequently result in

significant lost revenue and reputational damage. Continued labor stresses can impact the long-term profitability of the business. At the same time, positive outcomes of effective labor engagement can include enhanced work practices, labor utilization, as well as the reduction in safety incidents, accidents, or fatalities.

## **Workforce Health & Safety**

Safety is critical to mining operations due to the often hazardous working conditions. The Metals & Mining industry has relatively high fatality rates compared to other industries. Fatalities or injuries can result from a number of hazards associated with the industry, including powered haulage and machinery as well as mine integrity. Poor health and safety records can result in fines and penalties, and an increase in regulatory compliance costs from more stringent oversight. A company's ability to protect employee health and safety, and to create a culture of safety and well-being among employees at all levels, can help prevent accidents, mitigate costs and operational downtime, and enhance workforce productivity.

## **Business Ethics & Transparency**

Managing business ethics and maintaining an appropriate level of transparency in payments to governments or individuals are significant issues for the mining industry. This is due to the importance of government relations to companies' ability to conduct business in this industry and to gain access to mining reserves. The emergence of

several anti-corruption, anti-bribery, and payments-transparency laws and initiatives create regulatory mechanisms to reduce certain risks. Violations of these laws could lead to significant one-time costs or higher ongoing compliance costs, whereas successful compliance with such regulations could provide risk mitigation opportunities and avoid adverse outcomes. Companies with significant reserves or operations in corruption-prone countries could face heightened risks. Companies are under pressure to ensure that their governance structures and business practices can address corruption and willful or unintentional participation in illegal or unethical payments or gifts to government officials or private persons.

## Tailings Storage Facilities Management

The Metals & Mining industry faces significant operational hazards, particularly those associated with the structural integrity of tailings storage facilities (TSFs). A catastrophic failure of such facilities (e.g., a dam failure) can release significant volumes of waste streams and materials that are potentially harmful to the environment, leading to high consequence impacts on ecosystems, human livelihood, local economies, and communities. Such catastrophic incidents may result in significant financial losses for companies and erode their social license to operate. Robust processes and approaches to TSF design, management, operation, and closure, as well as appropriate management of associated risks, can help prevent such incidents from occurring. Companies that adopt robust practices to maintain the integrity

and safety of TSFs may do so through assigning accountability for tailings management at the highest levels of the company, conducting frequent internal and external independent technical reviews of TSFs, and ensuring that mitigation measures are implemented in a timely manner in case of a safety concern. Additionally, a strong safety culture and well-established emergency preparedness and response plans can mitigate the impacts and financial implications of such events should they occur. Company obligations related to long-term remediation and compensation for damages may result in additional financial impacts in case of a failure. A company's ability to meet such obligations after an incident occurs is an additional component of emergency preparedness.