KPMG

Digging deep:

Risks and opportunities in mining

Foreword

The minerals and metals industry is a fundamental pillar of the global economy. The industry has played a pivotal role through history and will continue to do so as we embrace and facilitate the transition to a low carbon future. The outlook for growth is strong; however, the risks and opportunities that lie ahead for the industry have never been broader and more diverse. While the demand for metals and minerals is rapidly growing, there is consensus amongst the industry that the ability to develop new mines is an increasing challenge, owing to stringent regulatory and compliance requirements, heightened expectations on environmental, social, and governance (ESG) performance, rapid technological advancements, and the competition to attract and retain skilled talent, to name a few. By addressing these challenges, mining and metals companies can define success for their organizations and the industry as a whole and seize the opportunities that lie ahead.

This year's risks and opportunities in mining survey finds that, overall, confidence amongst mining operators is robust. The great majority are optimistic about the prospects for the industry over the next five years. With commodity prices high, and demand for precious metals and critical minerals expected to increase, there are many reasons to be confident about the road ahead.

However, the industry faces several new and ongoing challenges that will impact its growth potential, and many fear for their ability to access the capital required to meet demands. Expectations of stakeholders are evolving, especially as it relates to ESG, and particularly in terms of access to capital and regulatory approval. The majority of operators say that investors' ESG expectations are not clearly understood or even consistent across the market.

The survey also indicates that the mining industry is increasingly leveraging technologies to drive improvements in operational efficiency, reduce costs, and to enhance worker health and safety. However, respondents believe there is greater potential, with many reporting they are maintaining financial flexibility to explore new and innovative technologies. We are seeing that many mining companies are looking to strategic alliances and joint ventures as a way to achieve growth and possibly tap into innovative and emerging operational growth challenges.

The themes emerging from our survey clearly indicate that expectations of growth are high, with demand for many metals and minerals expected to increase in the next 10 years. However, more than ever before, there exists a broader and deeper set of stakeholder expectations and challenges, creating a complex mix of priorities and contributing to difficulties in accessing capital. Getting the balance right will be the challenge for mining executives and the industry as a whole.

Survey methodology and respondent base

KPMG in Canada surveyed 100 mining executives between July and August 2024. This included operators, exploration and development companies, mining service providers, and mine finance companies.

- Respondents were located in major mining regions worldwide, including Canada, the U.S., Central and South America, and Europe.
- Over half of survey respondents identified their main area of business as gold and precious metals, with the remainder specializing in base metal/critical minerals mining (such as copper, nickel or lithium), diversified mining, uranium and coal.
- Market capitalization of companies surveyed ranged, relatively evenly, between $100m to greater than $10bn.

Digging in: Top risks for the mining industry

Shorter-term: (0-3 Years)

1. Community relations & social license to operate
2. Commodity price risk
3. Access to capital
4. Permitting risk
5. Geopolitical uncertainty
6. Cyber & IT security risks
7. Access to & retention of key talent
8. Controlling operating costs
9. Regulatory, reporting, compliance changes/burden
10. Inflationary pressure

Longer-term: (3+ Years)

1. Commodity price risk
2. Community relations & social license to operate
3. Geopolitical uncertainty
4. Access to capital
5. Permitting risk
6. Regulatory, reporting, compliance changes/burden
7. Access to & retention of key talent
8. Ability to replace reserves
9. Climate change and natural disasters
10. Cyber & IT security risks

Overall, the top risks, both in the short-term and in the long-term, are largely consistent, highlighting the complex landscape that lies ahead for mining companies. In the short-term, our survey respondents consider community relations and social license to operate as the foremost risk, closely followed by commodity price risk. In the long-term, respondents consider commodity price risk to be a more pressing concern, while social license to operate, though still vitally important, moves to the second position.

Access to capital continues to be a risk for mining companies, both immediately as well as longer–term. Possible reasons include increasing stakeholder expectations, particularly regarding ESG and investing in low carbon solutions, declining ore grades, growing community expectations, and stricter regulations. The process of bringing a mine from exploration to production is taking longer and becoming more challenging, making the return for some investors more uncertain.

Completing the top five risks, permitting is at four, followed by geopolitical uncertainty. Permitting remains as live an issue as ever, with the length of time and the effort required to secure permits showing little sign of improving. Geopolitical uncertainty has become more acute in recent times given various trade tensions, regional conflicts and a spate of political elections around the world, all of which have the potential to impact the value chain in various ways.

Emerging risks identified this year, as compared to our 2022 survey, include cyber & IT security risks, which made their debut in the top 10 short and long-term risks. Cyber threats are evolving at an alarming rate, with indisputable reputational and operational implications. The mining industry is no exception, especially considering threats associated with more remote and dispersed operations and the adoption of new and emerging technologies.

"Access to capital is an acute issue for junior mining companies. It is very challenging to raise funding for the exploration and development needed to meet long-term demand. The length of time needed to obtain permits only exacerbates the issue."

Heather Cheeseman
National Mining Leader,
KPMG in Canada

"License to operate is key for the mining industry because it weaves together so many elements that relate directly to public perceptions of mining - regulatory requirements, governmental relations, human rights and Indigenous communities. You can't run a successful long-term business without it."

Kim Swanzey
National Sustainable Supply Chain Leader,
KPMG in Canada

Industry outlook & growth

A convincing 79% of respondents are either somewhat or extremely optimistic about the growth prospects of the industry in the next 5 years. That compares favourably to the 62% recorded in our last global survey in 2022.

How would you describe your outlook on the industry and its growth prospects in the next 5 years?

Which of the following strategies do you expect to be most important for achieving your organization's growth objectives over the next 3 years?

Mining companies will need to significantly change the current operating/business modelin order to continue to achieve returns for investors, and to fund investments in technology, sustainability, and long-term growth.

The industry and governments must work more closely together to align and streamline permitting and related processes. This would speed mine development and help reduce costs.

The risks associated with operating in foreign countries (i.e. other than country of head office) are increasing as a result of geopolitical uncertainty and global battle for critical minerals.

The mining industry must work collectively to attract and retain a more diverse workforce at all levels.

Organic growth (exploration and development etc.) and mergers & acquisitions (M&A) remain critical strategies for growth, having been identified as the two most common strategies by respondents at 47% and 46%, respectively. Overall, M&A activity has slightly declined in early 2024 compared to Q4 2023. However, the mining sector remains active, with significant transactions in critical minerals such as copper and lithium due to the energy transition. In fact, these minerals accounted for over 70% of critical mineral deals by volume last year. The industry's focus on securing resources for technology and renewable energy is anticipated to drive continued M&A activity in the near future.

While traditional M&A is still a top strategy for achieving growth, mining companies are increasingly seeking less traditional strategic alliances and partnerships to tap into innovative technology, critical skills and unlock value. In fact, 21% of survey respondents identified strategic alliances with third parties as a key strategy. A notable example is a leading mining company's alliance with a major equipment manufacturer to achieve zero-emissions mining through the deployment of an all-electric autonomous haulage fleet by 2027.

Joint ventures and partnerships were identified by 22% of respondents as their top growth strategy, while only 13% of respondents identified innovation and technological transformation as key strategies for achieving growth. Most respondents cited technology and innovation as more critical for improving operational efficiency, optimizing costs, and improving mineral resources.

More broadly, there is strong consensus amongst executives on some of the key success factors behind unlocking growth. Ninety percent of respondents agree or strongly agree that industry and governments must work more closely together to align and streamline permitting processes. Additionally, 78% agree or strongly agree that the risk of operating in foreign countries is increasing, making collaboration within the industry and across governmental bodies even more important.

Changing the model?

Over half of respondents agree that changes in operating and business models are needed to continue achieving returns for investors and to fund investments in technology, sustainability and long-term growth, although 29% are neutral on this point. Whether its investing in emerging technologies, forming alliances and partnerships, or enhancing industry collaboration, there is an acknowledgement that innovation extends beyond just technology.

More than two-thirds of executives also agree that the industry must work collectively to attract and retain diverse talent at all levels - a key issue that will only become more pronounced as greater numbers of experienced staff retire, leaving a talent gap that needs filling.

"The picture is of a confident industry who are used to navigating the challenges. Especially amongst critical minerals businesses, this confidence may have been boosted by the Canadian government's increasingly protectionist stance in terms of foreign takeovers."

Heather Cheeseman
National Mining Leader,
KPMG in Canada

"The data suggests there may be opportunity for mining businesses to adopt new models, given all the dynamic risks around them. Those that embrace transformation and change are most likely to achieve a profitable business model for the future."

Katherine Wetmore
GTA Mining Leader,
KPMG in Canada

Technology & Innovation

The mining industry has been a relatively early adopter of digital technology, including some forms of traditional AI and machine learning. This is evidenced by the fact that over half of respondents (56%) agree or strongly agree that their company collects and uses data effectively to continuously improve operations. The same proportion also say that they are using digital and new technologies to improve the health and safety of workers.

However, there are signs that many organizations could do more in this space - with around 30% of executives remaining neutral on both of these questions.

There remains opportunity with the new buzz technology sweeping other sectors and industries - generative AI. Just 19% of respondents say their company is adopting generative AI to boost efficiency and lower costs. This may be because generative AI, being focused on the production of content, does not have as much to offer mining and other heavy industrial sectors as it does some other forms of business. However, it could certainly be harnessed to help with items like the creation of digital twin simulations of mining processes and plants, as well as for areas like resource modelling and geological formation analysis. This is an area that we can expect the industry to focus on more as time passes, as it is still early days in the generative AI journey.

Our company is adopting generative AI to boost our efficiency and lower cost.

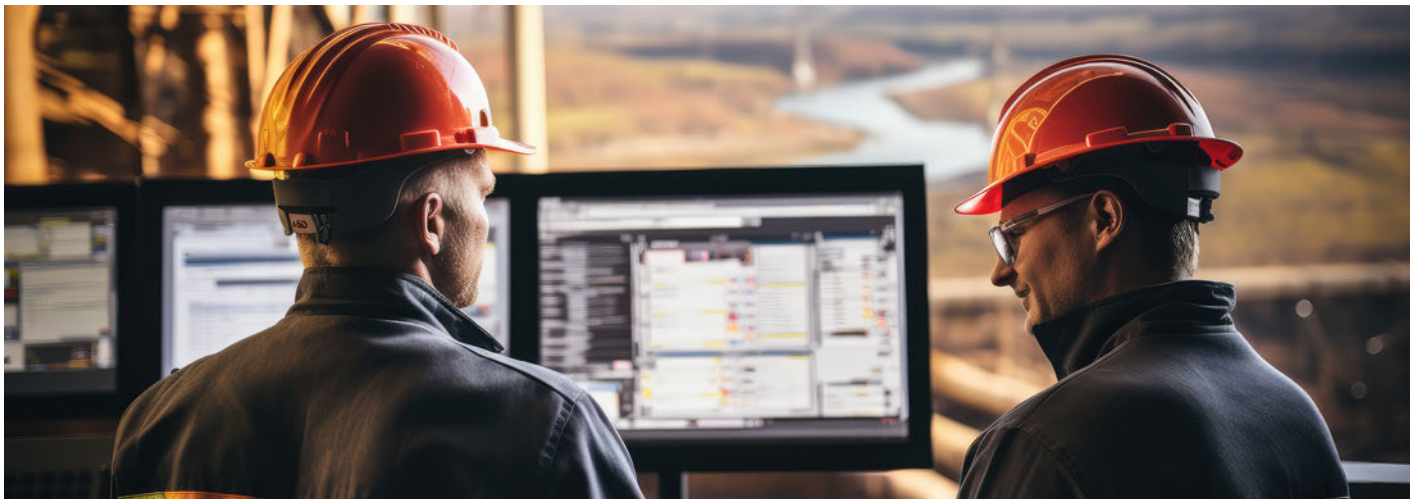
Our company collects and uses data effectively to continuously improve operations.

Our company has a comprehensive approach to address cyber security risks including operating technologies.

Our company is adopting digital and new technologies to improve health and safety of our workers.

Our company is maintaining financial flexibility to incorporate new technologies and tools as they become commercially viable.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree



Which of the following are of highest priority in driving investments in technology and innovation at your organization over the next 5 years?

Improve Operational Efficiency

Optimize Costs

Improve Mineral Resources

Corporate/Supporting IT Systems

Energy Transition/Decarbonization

Improve Worker Health & Safety

Which of the following are of highest priority in driving investments in technology and innovation at your organization over the next 10+ years?

Improve Operational Efficiency

Improve Mineral Resources

Optimize Costs

Energy Transition/Decarbonization

Improve Worker Health & Safety

Corporate/Supporting IT Systems

Tools like AI and digital twins are extensions of data platforms and are among the leading digital platforms in the mining industry. Digital twins seamlessly integrate various digital technologies, such as IoT, GIS, data analysis, AI, and chatbots, into a single end-user application. AI is being utilized for core sampling, data analysis, mineral sampling, deposit modelling, and more. However, the cornerstone of any digital platform is its data – an area where the industry has long been engaged in data analysis. In fact, this extensive involvement in data analysis likely paved the way for AI, even before AI became prominent.

Mining has so much potential to expand the use of AI; we see use cases such as:

1. Develop production schedules to optimize asset utilization and energy efficiency
2. Implement predictive maintenance programs based on early detection of performance degradation and faults
3. Track and evaluate new technologies and inform decarbonization decisions going forward
4. Identify changes in policies and regulation to anticipate impact on development and operations

*Source: KPMG Mining and Metals Outlook 2024

ESG

Progress on environmental and social sustainability performance remains a work-in-progress across the mining value chain, encompassing not only mining operators, but also governments, financial institutions, suppliers, and downstream purchasers. Significant collaboration across all parties is required to make progress on key issues such as mitigating climate change, reducing biodiversity loss, achieving greenhouse gas emissions targets, and eliminating modern slavery in supply chains. This progress must be achieved without compromising the supply of metals and minerals needed for economic growth and the energy transition.

Over half of respondents (59%) disagree or strongly disagree that investor expectations and measures are clearly understood and consistent across the market. In fact, this is almost the same as our 2022 global survey, indicating that, despite the increased role of ESG in the business agenda, investor frameworks for evaluating ESG and sustainability risks are still emerging. It's an issue that mining operators and the entire value chain urgently need to find a way to address. The challenge of gaining access to capital is a testament to that. Despite this, 45% of executives believe that their capital allocation process adequately considers ESG risks and opportunities.

It is not only investors' expectations around ESG that need attention, the survey findings also show that more work and clarity is needed internally too. Only half of respondents (53%) agree or strongly agree that their organization has a well-defined ESG strategy with the resources needed to execute on it, and only 55% believe that ESG risks are well-defined and understood internally.

"The onus on implementing sustainable measures is largely falling on site level mining operators, even though it is the downstream customers of the industry such as auto manufacturers or battery makers who derive the greatest value. The cost and challenges of sustainable sourcing should be shared across the mineral value chain, along with the benefits."

Kim Swanzey
National Sustainable Supply Chain Leader,
KPMG in Canada

Taking the initiative

What emerges is a picture of an industry grappling with various and evolving demands that consume time and resources, forcing miners to react and respond, with sixty-one percent of executives agreeing that ESG initiatives are mainly driven by regulatory, legal, compliance or contractual obligations as opposed to meeting the core expectation of stakeholders and aimed to build trust. Particularly in a context where these external ESG requirements are not clearly defined or implemented, there is an opportunity for the industry to proactively engage with regulatory and financial stakeholders to assert leading ESG practices as a way of improving business performance, rather than as a reactive compliance requirement.

The industry appears to have taken a relatively cautious approach to formal net zero commitments - with only 40% of executives saying their organization has pledged to reach net zero across scopes 1, 2 and 3 by 2050 or earlier. The proportion rises to 60% amongst businesses with revenues of over $1bn, while smaller, newer or private businesses are less likely to have made formal commitments.

Organizations that adopt a proactive approach will be better equipped to navigate the numerous emerging regulations supporting the transition to a more sustainable economy.

> "If operators' ESG approach is merely compliance-driven, it means they're at risk of missing out on all the upside of value creation and growth opportunities, which are meaningful to investors. Mining companies need a clear strategy and detailed transition plans to achieve environmental and social sustainability outcomes which can be used to effectively communicate commitments and track performance."

Andrew McHardy
National Decarbonization Hub Leader,
KPMG in Canada

For example, Bill C-59's amendments to the Competition Act (June 2024) include steep financial penalties (up to 3% of global annual gross revenues) for companies found to be engaging in greenwashing – the practice of making false or misleading environmental and social claims to promote products, services, or business interests. Companies which have invested in proper substantiation of their sustainability commitments (e.g., increasing transparency of climate and decarbonization commitments through transition plans) will be able to provide more meaningful ESG disclosures for investors, regulators, suppliers and other stakeholders.

Cyber risk

Mining companies have reasonably high confidence in their cyber security with over half (57%) agreeing that they have a comprehensive approach to address cyber security risks including operating technologies. However, there is still work to be done in tackling the challenges posed by cyber risks. Respondents listed Cyber & IT security as a top concern in both the short and long-term but just under half of mining executives noted that they lack a cyber strategy, highlighting the need for further action. Cyber incidents have been increasing in all industries, especially ransomware attacks, and cyber criminals are constantly evolving new techniques to attempt to break into systems and disrupt processes. Indeed, the advent of generative AI could add a whole new dimension to their attacks, something that mining organizations and businesses across sectors will need to ensure they are prepared against.

Then there is the investment needed to fund innovation and new technology. Less than half of executives (47%) agree that their organization is maintaining the financial flexibility needed to incorporate new technologies and tools as they become available.

Driving efficiency and ESG?

For the great majority (74%), improving operational efficiency is the overriding purpose of technology investment, followed by cost optimization.

Leveraging technology to support the energy transition and decarbonization comes much further down the list (cited by 19% of respondents) – despite the fact that nearly two-thirds of executives agreed in a different question that technology and innovation will play a crucial role in solving ESG challenges. Over a longer timeframe (10+ years), however, more executives (33%) signal a greater focus on using technology for decarbonization, which at least suggests it is on the radar for the future.

Mining companies have made progress in embedding digital and data technologies into their processes, as well as utilizing electrification and hydrogen power trains in machinery and increasing the use of drones and sensors for surveying and monitoring. But there are signs that some organizations could raise their sights further – pushing harder on technology as a key lever for both operational efficiency and net zero commitments, creating a compelling narrative to share with investors and other stakeholders.

"The combination of digital twins and AI can revolutionize mining operations. Predictive maintenance can minimize equipment downtime, AI-powered simulations can optimize production processes, and real-time data analysis can enhance safety and environmental monitoring - helping with the ESG agenda too."

Matt Grant
Director of Digital Twin and Spatial Computing, KPMG in Canada

Navigating the road ahead

The outlook for the industry is healthy - but in a dynamic and often unpredictable environment, mining companies will need determination, focus and agility to succeed.

The importance of balance cannot be overstated. The mining industry must persist in challenging itself to adopt a model that achieves sustainable operations, minimizes impacts on the environment, supports other essential industries, and benefits communities, all while operating profitably and generating returns for shareholders.

Technology can be leveraged to help achieve this, while also increasing efficiency and lowering costs a true win-win for those that find the formula.

Learn more: kpmg.com/ca/mining

Katherine Wetmore
GTA Mining Leader,
KPMG in Canada

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National Mining Leader,
KPMG in Canada