



## Key messages

01. The mine of the future dominates the landscape of the mining industry, with digitization and automation more important than ever. But success for mining companies won't be about adopting the latest applications and technologies, but rather the embedding of digital and innovative thinking into the heart of their business strategy. This won't be easy as competition for digital talent and those who can deliver insights from data is fierce.
02. Boards are under increasing pressure as the transformation in their sector will require new ways of thinking and access to a diversity of views. This will not only be key inside the enterprise but also to the relationships with governments and local communities, the public image of mining, and in response to shareholder activism.
03. Mining companies need to be mindful of the disruptive impact of technology on their commodity investment decisions. At the same time, they must respond to the issue of reserve replacement as budgets for exploration and development continue to dwindle and the appetite for acquisitions remains low.

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### Bringing digital to life Using data-driven insights to drive value

- The industry's value proposition is shifting to how well a company acts on information to optimize production, reduce costs, increase efficiency, and improve safety.
- Data—and the ability to organize, manage, and process it—is rapidly becoming a competitive differentiator and may even spur new business models.
- A digital strategy—which can start with smaller-scale projects as a company builds the capacity to use data to resolve a wide range of business problems—will help mining companies embed digital thinking into the heart of their business.

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### Overcoming innovation barriers Charting a path towards innovation maturity

- Despite the understanding among mining executives that innovation is critical, industry players cannot yet be considered truly mature innovators as they lack consistency and strategic focus when it comes to innovation.
- Some of the barriers to innovation within the mining sector include an aversion to risk; a propensity to favor short-term cash flow generation; a lack of a clear vision to guide and enable longer-term transformation; and an inclination to distrust collaboration due to intellectual property and competitive concerns.
- Mining companies must define their innovation strategy and rally their people around it; strong support from leadership is especially critical as is the ability to measure effectiveness and incentivize appropriate employee behaviors.

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### The future of work Re-envisioning talent management in the digital age

- As the digital mine becomes a reality and processes are augmented by robotic process automaton (RPA), mining companies will require access to a broader array of systems experts and data analysts.
- The quest for scarce digital talent, with mining companies competing against more attractive industries, means miners may have to redefine roles, change corporate cultures, attract and train in new ways, reimagine traditional career paths, and rebrand to raise their appeal among millennial talent.
- As the workforce becomes more diverse, distributed, and connected, mining leaders will need to foster an inclusive culture, manage across generations, and model the use of social tools that improve communication, collaboration, and connectivity.

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### The image of mining Changing public, employee and customer perceptions

- Although the mining sector has taken significant strides to improve their image in recent years, it is still operating under a legacy of weak environmental practices, fractious community relations, and a historic lack of workforce diversity.
- Mining companies need to take proactive steps to address, and change, their reputations as well as reposition themselves in the eyes of their customers by demonstrating their capacity to deliver value.
- To rebuild trust, mining companies must back messages with action, including more transparency and concrete measures of sustainability that can help empower local communities and create an environment of shared responsibility.

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### Transforming stakeholder relationships

#### The growing need to achieve measurable social outcomes

- Many governments of resource-rich countries continue to put pressure on the mining industry.
- With some social initiatives failing to deliver their intended results and the impact of automation on job creation, traditional approaches to community and government relations must change.
- Mining companies should work to create a stronger sense of shared value with local governments and communities, embracing more collaborative modes of engagement that get local communities more invested in mine operations.

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### Water management

#### Finding sustainable solutions to a pressing issue

- As concerns around water grow—both scarcity as well as toxic excess due to flooding—regulators, communities, and environmental groups are turning the spotlight on water-intensive industries such as mining.
- Mining companies must develop sustainable water management strategies and find more innovative ways to reduce, reuse, and recycle water in water-scarce regions.
- A risk assessment can help mining companies gain a clear understanding of their current water use, assess the true costs of water, and guide the implementation of digital technology in water management.

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### Changing shareholder expectations

#### Investors demand greater accountability

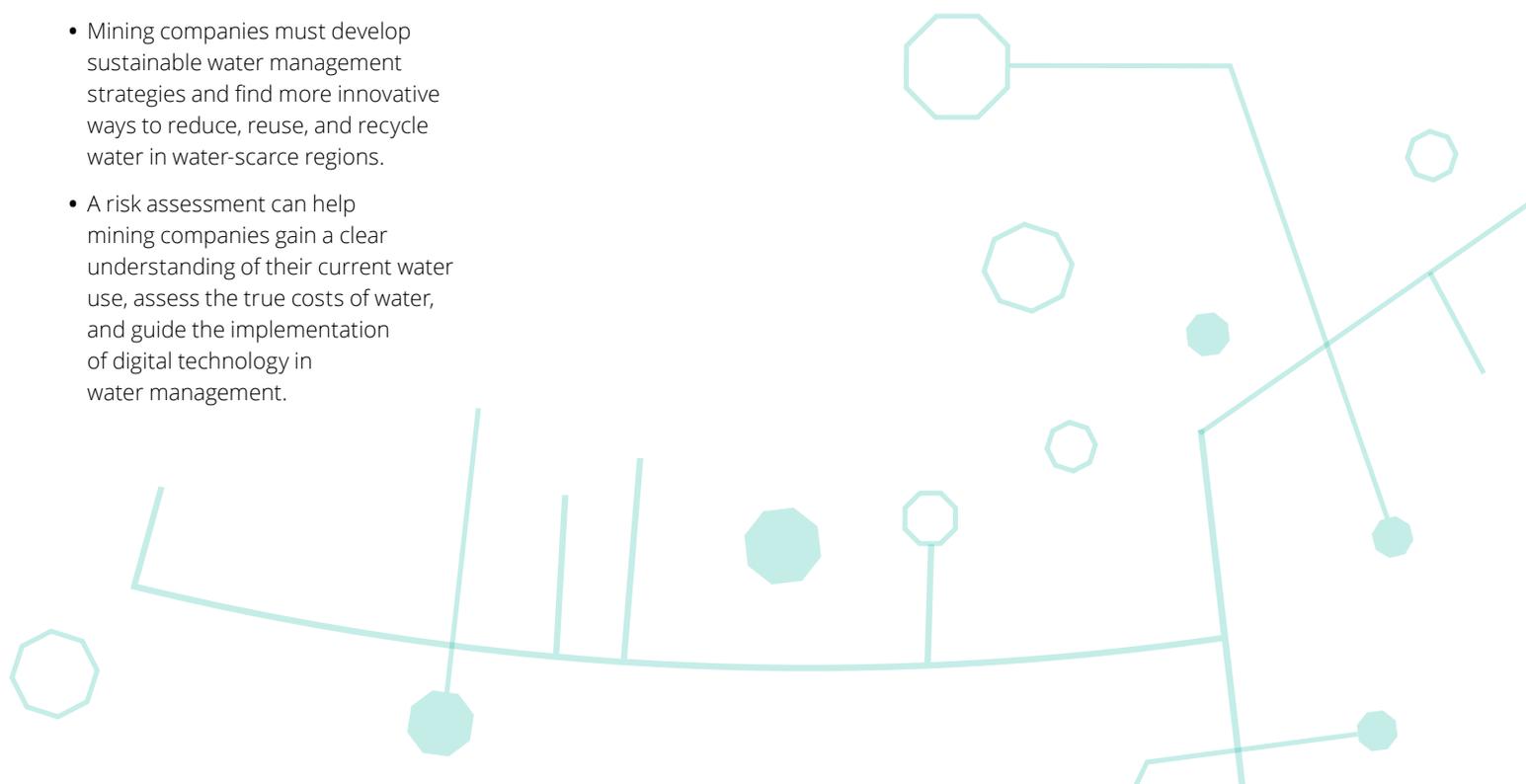
- In light of rising commodity prices, some shareholders and institutional investors are expecting increased dividends and returns, with some shareholders engaging in activism to influence operational decisions.
- As shareholder expectations spiral, some mining companies have begun focusing on their credibility in the investor community rather than on long-term strategies.
- The traditional corporate governance model based on shareholder returns may not be appropriate for a cyclical sector like mining; better measures could include the value created for multiple constituencies—such as customers, employees, suppliers, and communities—not just for shareholders.

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### Reserve replacement woes

#### Finding a balance between caution and courage

- Although the fortunes of many mining companies are on the rebound—thanks to intense cost cutting, a focus on fundamentals, and a commitment to portfolio simplification—the turnaround has not remedied the supply constraints that currently plague the industry.
- Some of the reasons for reserve depletion include lower overall capital expenditures; high debt loads that limit exploration and development budgets; competitive pressures; and a hesitation to engage in acquisitions to feed the exploration pipeline.
- To build up supply, mining companies should consider entering into joint ventures with junior explorers, seek out more creative funding models, and leverage new technologies that offer more advanced surveying capacities.



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### Realigning mining boards New skillsets are needed to help drive transformation

- Mining companies need to ensure that their boards are properly constituted to support the transformations the sector is currently undergoing, including fluency in such areas as technology, compensation and incentive structures, talent constraints, and cybersecurity.
- Old ways of thinking and low levels of diversity among mining board members can limit their ability to uncover outside views and effectively challenge organizational assumptions.
- Boards need to create a vision for transformation by looking for members with a broader set of attributes as well as developing refreshment policies that promote the regular review of board composition.



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### Commodities of the future Predicting tomorrow's disruptors

- To assess which commodities to invest in, and which to divest, miners need to keep their fingers on the pulse of fluctuating consumer demands and the emergence of new technologies, such as electric vehicles (EVs).
- Mining companies are seeking greater exposure to later-stage commodities—such as the tech metals and boutique minerals lithium and graphite used in EVs—and moving away from traditional commodities like coal.
- Mining companies can track and capitalize on trends by following the start-up community and seeking out vertical integration opportunities—but they must also develop the capacity to separate the real from the hype.

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