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Tracking the trends 2023
The indispensable role of
mining and metals



Introduction

The indispensable role of mining and metals

The world is at a critical point in time, socially, environmentally, and economically. The latest projections by the United Nations suggest that the global population could hit 8.5 billion in 2030 and 9.7 billion in 2050.¹ With a growing population comes a growing demand for the metals and minerals that underpin societal progress. From civil infrastructure to transportation, and technology to agriculture, the products that the mining and metals sector produces, support and enable virtually every sector globally.

The paradox is that, while the need for mined products has never been greater, public opposition to mining activities has never been higher. The green energy transition is expected to be a mineral-intensive one—the International Energy Agency estimates that the demand for minerals used for electric vehicles and battery storage will grow tenfold by 2040.² Yet, at the same time, approvals for projects that could become important providers of critical minerals, such as lithium (see Rio Tinto's Jadar project in Serbia³), are being hampered due to protests. The juxtaposition between need and want is stark, and the gulf between them creates a very real threat to global climate change mitigation.

For too long, the stories told about the mining and metals industry have centered on the negatives. However, the opportunities

that mining and metals companies can offer to provide for and enhance the prospects of the population, as well as the environments they reside in, are vast. Mining underpins approximately half of the global economy⁴ and therefore, it has the greatest potential of any industry to positively influence social, environmental and economic development.

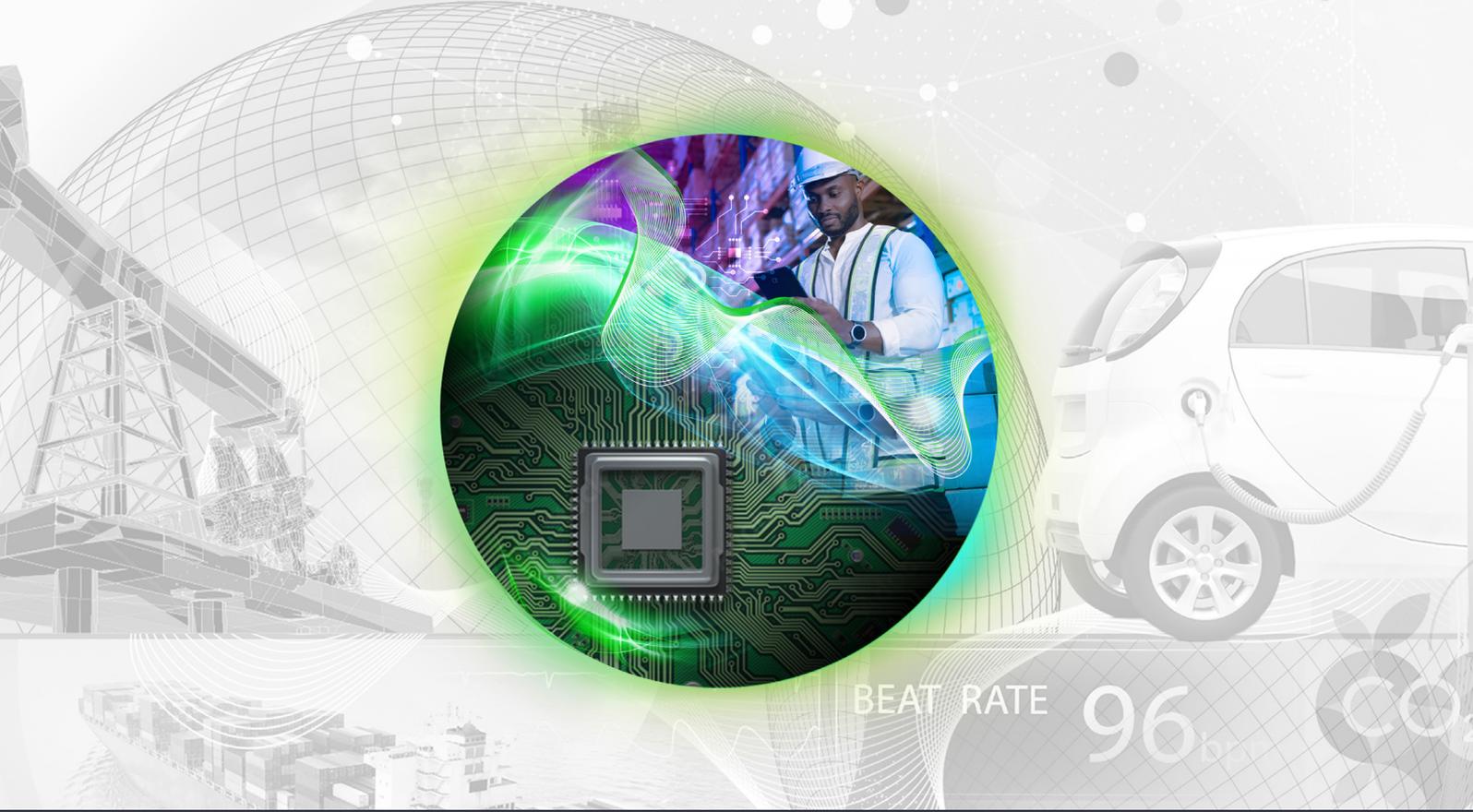
This year, Deloitte Global's Tracking the trends 2023 focuses on the indispensable value that mining and metals companies can deliver, with the emphasis on taking action now for a better tomorrow. In each of these 10 trends, our network of Mining & Metals sector professionals globally offer up expertise, insights, and examples to spark conversations about how mining and metals organizations can make a difference in the world.

Changing perceptions of the industry by putting people and natural capital front and center in strategies; designing organizations and products for circularity; creating safer, more respectful places of work; and innovating together to make the possibility of ultra-efficient mines a reality will be key to creating a healthy, regenerative ecosystem inclusive of people, planet and industry.

We're excited to discuss these trends with you and explore how they will shape your company's future. Thank you for your ongoing support.

Endnotes

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Trend 10

The power of cloud

Building an industry that thrives through change

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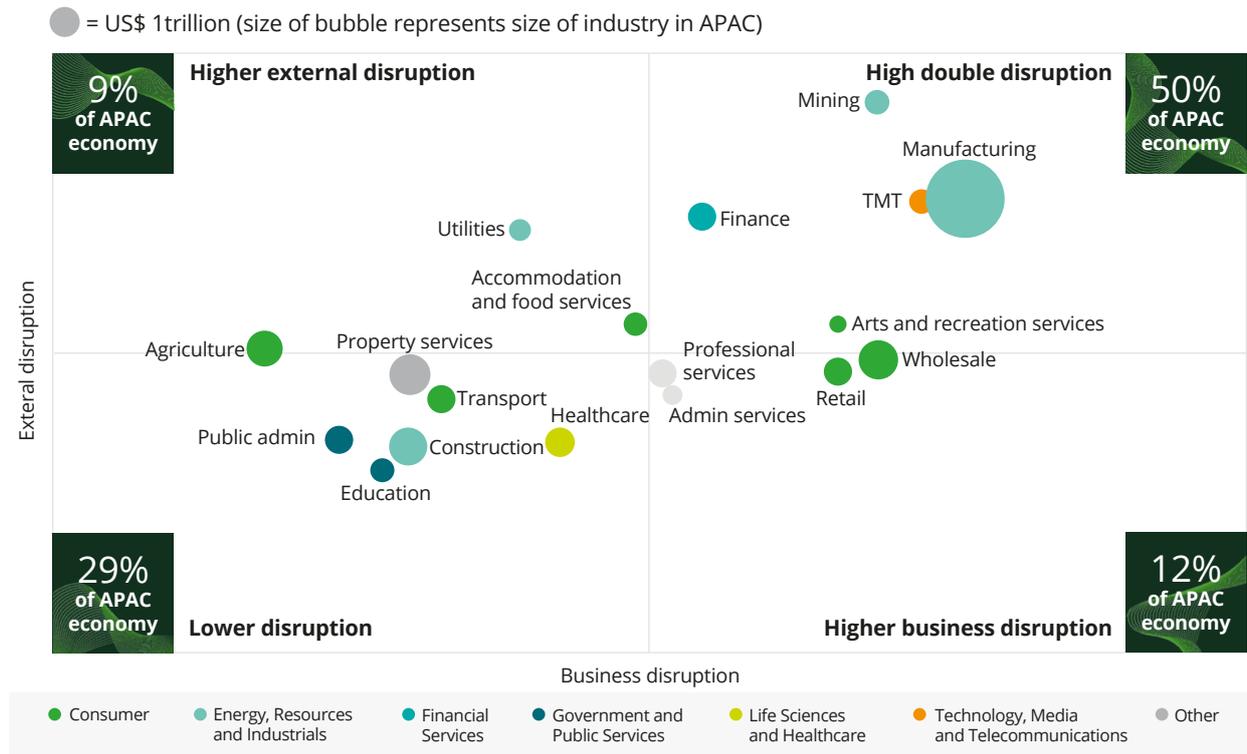
As the provider of raw materials for many other industries, the mining and metals industry is in a unique position; one that presents both challenges and opportunities. While these companies are no strangers to disruption, over the past years the frequency and types of changes that they have faced have grown substantially.

economy) are among those expected to face the most significant level of disruption in the future, with changes coming from both external forces (e.g., environmental pressures, commodity price fluctuations and supply chain disruptions) and internal threats (e.g., skills shortages, use of technology or competition).¹

As part of the 2021 report, [The cloud imperative: Asia Pacific's unmissable opportunity](#), Deloitte Australia Access Economics surveyed 600 companies across 18 industries in the Asia Pacific region to develop a disruption map (figure 1). This revealed that businesses operating in mining (a significant contributor to the Asia Pacific

Dan Newman, partner, Cloud Transformation Leader, Deloitte Australia, and author of the report, says: "Our research identified that mining and metals companies, while being exposed to this double level of disruption, are also some of the least prepared to respond and adapt to changes."

Figure 1: Disruption map*



Source: Deloitte Australia Access Economics

Note: *The disruption map was developed as part of Deloitte Australia Access Economics' The cloud imperative: Asia Pacific's unmissable opportunity report.

In [Tracking the trends 2021](#),² Deloitte Global highlighted the need for organizations to boost their resilience in a way that would stand them in good stead through a range of scenarios. This is even more important today as the rate of economic, social and environmental change is expected to continue to increase over the coming decades. In building resilience, mining and metals companies will not only enhance their own longevity; they will also help secure supply chains that underpin global food production (potash, phosphate salt), energy provisions (critical and battery metals) and infrastructure (steel and iron), to name just a few.

Turning challenges into opportunities

For miners and metal providers to thrive through change (whether predictable or unpredictable) requires that their structures, processes and operations become more dynamic. Ultimately, this will allow them to respond faster to both challenges and opportunities through new partnerships, attracting new talent and accelerating innovation efforts.

Cloud computing serves as an enabler during times of disruption and has supported value creation in multiple industries over the past decade.

Cloud involves using a network of remote servers accessible over the internet to store, manage, and process data (as opposed to local servers or personal computers). It's commonly used to deliver tools and services such as databases, networking, software, analytics and intelligence on demand.³ The ability to rapidly deploy and scale resources up or down is a major advantage to businesses. Cloud allows even the smallest companies to access the same tools and services as the largest enterprises.

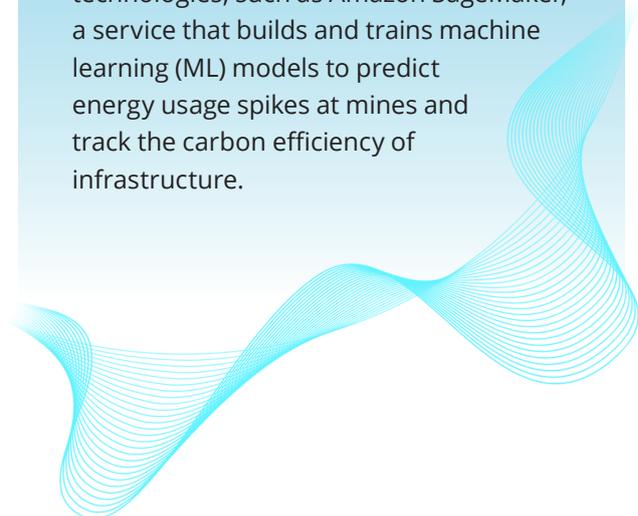
Around 80% of the organizations surveyed for Deloitte Australia's Cloud imperative report stated that by implementing cloud they were better prepared to help address future challenges and organizational needs. A similar proportion said that cloud enables them to innovate more quickly and frequently, and seven out of 10 respondents indicated that cloud allows them to instantly scale projects up or down.⁴

The positive power of mining and metals

Cloud technology is also accelerating the decarbonization of the minerals and metals upon which the energy transition depends. In May 2022, Australia's Electric Mine Consortium (EMC), which comprises some of the world's leading mining and services companies, announced that Amazon Web Services (AWS) would be joining its ranks and funding the creation of a new data-sharing platform.⁵

Based on AWS S3 cloud storage technology, the platform will capture, clean and share real-time data relating to mine site energy consumption and storage, electricity usage and renewables output. The aim is to help member companies better understand the impact of different projects and investments on their carbon footprint.

EMC will also be able to leverage other technologies, such as Amazon SageMaker, a service that builds and trains machine learning (ML) models to predict energy usage spikes at mines and track the carbon efficiency of infrastructure.



Accelerating cloud adoption and maturity

Today, the level of cloud adoption and maturity varies within the mining and metals industry. Early movers include tier one companies, such as Rio Tinto. Rio began moving its SAP applications to the Microsoft Azure cloud platform in 2016 as part of its digital transformation.⁶

More recently, BHP selected AWS and Microsoft as its long-term cloud providers in June 2021.⁷ AWS will provide data analytics and ML tools to rapidly deploy digital solutions and improve BHP's operational performance. Meanwhile, Microsoft Azure will host BHP's global applications portfolio. This will enable BHP to leverage its existing Microsoft licenses and SAP applications portfolio and reduce its reliance on regional data centers.

Rakesh Surana, Partner, Mining & Metals Leader, Deloitte India explains: "Most companies will already be using some cloud-enabled functions. However, there would be increased business benefits and value gained if they were more prepared and ready to progress toward a greater level of cloud adoption."

As these examples demonstrate, cloud maturity, even within large mining and metals companies, is still at a relatively early stage. Many companies are only recently moving from building appropriate infrastructure and data centers to application migration and data modernization. However, once organizations have a digital core in place, then they can start tapping into cloud-based resources for a range of exciting use cases.

The tip of the "cloud" iceberg

In mining and metals, some of the most promising applications for cloud include data integration to enable analysis of mine site data, predictive maintenance of equipment to better manage and extend asset life, and the integration of supply chains.

Transforming maintenance in metals

In 2021, Swedish steelmaker, SSAB Europe, selected IFS Cloud to support seven of its production plants in Finland and approximately 2,500 users, including subcontractors and mobile work order users. The move is enabling the replacement of SSAB's legacy maintenance system and delivering maintenance planning capabilities, document management, quality assurance, warehouse management, mobile work orders, and B2B contracting for subcontractors.

The companies cited scalability of the platform as a key driver—it can be quickly and easily expanded as the business grows. And as information is stored centrally and accessed from anywhere, communication between stakeholders in SSAB—as well as production facilities, different organizations, and across processes—will benefit from better decision-making.⁸

Migrating legacy data from enterprise warehouses, or even specialist cloud databases, into a cloud-native data lake offers two advantages. First, it democratizes access to data by decoupling it from existing systems. Second, it allows companies to correlate events and trends across different domains. This supports the use of advanced simulation programs such as digital twins, which can be invaluable in process and operational optimization.

Newman adds: “We’re also seeing a push toward edge computing as part of miners’ cloud strategies. In Australia, a number of large companies are collaborating with hyperscalers, such as AWS, and Google, and localized data centers to leverage cloud providers’ edge solutions and enable low-latency workloads in the field. These are essential to autonomy and other Internet of Things-based technologies.”

Data integration through cloud also allows insights to be shared across supply chains, which will be vital in improving traceability and in lowering Scope 3 carbon emissions.

Cloud users can also benefit from the expertise within their cloud provider’s teams. The level of knowledge, for instance in data science, held within a company such as IBM will be infinitely broader, deeper, and more recent than that held within even the largest mining or metals company. Through cloud subscriptions, mining and metals organizations can leverage this capability and combine it with their own subject-matter knowledge to accelerate their innovation efforts. This will be particularly valuable to junior and mid-tier companies that may not be able to afford to build and maintain a large data science team in-house.

“Moving to the cloud means that organizations can focus on their core business and source of differentiation, rather than maintaining computing infrastructure and data centers,” says Newman. “Organizations should overcome any reservations on moving to cloud, embrace the opportunity, and act on it, as cloud is here to stay.”

Laying the foundations for cloud transformation

- **Develop an integrated cloud-business strategy:** In addition to having a solid technical plan for cloud migration, integrating delivery of this with the business's overall organizational strategies will help to drive top-level visibility and ensure success. Linking key performance indicators (KPIs) to delivery of the integrated strategy and assigning them to senior managers will further enhance accountability. KPIs should extend beyond technology targets from cloud initiatives to enhance business outcomes in specific areas, such as innovation, collaborative projects and employee satisfaction.
- **Create a cloud culture:** Leaders should actively communicate progress toward cloud targets and share positive use cases, both from inside and outside of the mining industry. Success stories will aid the creation of a cloud-enabled culture, generate interest in upskilling, and inspire new applications.
- **Plan for a cloud-ready workforce:** Through collaboration with cloud providers and migration partners, mining companies should identify any skill gaps in their current workforce and provide appropriate training. Also consider how the organization's human capital requirements could change over time as the organization and its cloud applications mature.
- **Out with the old systems, in with the new:** Legacy systems that have exceeded their point of maximum maturity can become a financial burden to maintain, hindering further organizational growth. The cloud transition can provide an opportunity to perform a stock take of current systems. Where appropriate, modernize and transfer these systems to the cloud environment, or phase out any that no longer serve their purpose.
- **Rethink cyber risk:** Increasing uptake of cloud services is driving change in the cyber risk landscape. The 2022 edition of IBM's X-Force Threat Intelligence Index revealed a 146% increase in new Linux ransomware code and a shift to Docker-focused targeting, which could potentially make it easier for criminals to leverage cloud environments for malicious purposes.⁹ Mining and metals companies must work with their cloud providers to help ensure seamless integration between traditional, hybrid and provider-based security measures.
- **Don't forget ESG:** When selecting a cloud provider, ensure organizational alignment with the supplier on ESG matters as they will become part of the mining organization's Scope 3 carbon footprint. Many hyperscalers are already ahead of other industries in reaching their net-zero targets. For instance, Google has offset historical emissions since its founding in 1998 and pledges to operate on completely carbon-free energy by 2030.¹⁰ Selecting a net-zero cloud provider will reduce miners' energy intensity by reducing local servers, and it will lower their overall carbon footprint.

Endnotes

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