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Tracking the trends 2024

Navigating global challenges and opportunities in mining and metals

Introduction

Navigating global challenges and opportunities in mining and metals

As we enter 2024, the mining and metals industry finds itself at the center of a complex matrix of challenges and opportunities, expectations, and demands.

With supply shortages looming in metals that are critical, not just to the energy transition but to global urbanization and industrialization, stakeholders are acting strategically to secure their supply chains (copper, for instance, is expected to see a supply deficit of 9.9Mt by 2035¹). With supply source alternatives such as urban mining still in their infancy, downstream companies and even governments are striking deals with miners and metals providers in a reshuffle that has seen some traditional value chains realign over the past 12 months.

Organizations also remain under pressure to improve the efficiency of existing assets and operations by embracing generative artificial intelligence (gen AI), leveraging third party delivery models with specialized back office capabilities and to unlock new value in assets. Additionally, the need for mining and metals companies to collaborate with industry peers, suppliers, and competitors to tackle productivity and environmental issues, all while upholding environmental, social, and governance (ESG) expectations in day-to-day operations remains a priority.

With strong business strategies in place and 2050 sustainability targets as its North Star, now is the time for the mining and metals industry to accelerate growth. However, with heightened uncertainty in the global geopolitical sphere and volatility in commodity markets, to do so may not be easy. Companies that navigate uncertainty, work with governments to address permitting issues for new projects, rethink the strategic value of exploration, work with regional players to address skills shortages, and drive toward becoming more purpose-led organizations are most likely to prevail.

In this, the 16th edition of Deloitte Global's *Tracking the trends*, a team of professionals from around the world provides insights and examples as well as practical ideas to help mining and metals companies rise to the challenges that lie ahead and capitalize on new opportunities. We're looking forward to discussing these trends with you in more depth and helping your organization to continue forging its own pathway to success. Thank you for your ongoing support.

Endnotes

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Trend 6

Going back to grassroots: Nourishing growth through investments in exploration

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Attitudes toward exploration, both from the mining and metals industry and investors, are currently a tale of two halves. In copper, a key metal to help drive the energy transition, companies are focusing capital expenditures on extending or expanding high-grade, profitable assets, rather than exploring for and developing new projects to meet increasing demand. This has resulted in a dwindling pipeline, which, if left unchecked, could manifest as a supply deficit in just a few years.

In contrast, battery metals have seen an explosion in spend on both exploration and development—lithium, for example, saw a 90% increase in exploration spend during 2022.¹ With this explosion, there's catching up to do around evaluating, permitting, and downstream processing if supply is to keep pace with demand as well as environmental, social, and governance (ESG) expectations.

Several factors have contributed to this dichotomy, but at the core, there is a historical fluctuation in investment into exploration (based on commodity prices) as a mechanism for organizational and industrial growth. In this trend, we'll consider how becoming more intentional with investments as well as strategy, leadership, and technology could contribute to more plentiful metals supplies and preserve market capital.

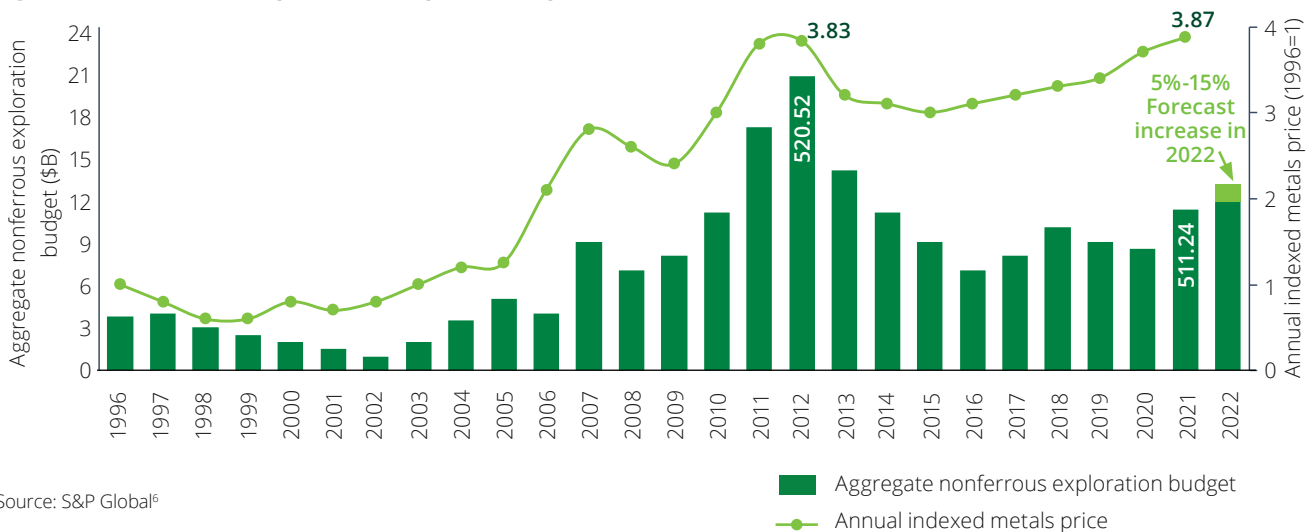
Put spending into perspective

According to the International Energy Agency, global exploration spending rose by 20% in 2022, driven mainly by record growth in lithium exploration. Canada and Australia led the way in this, with more than 40% year-over-year growth. Uranium also experienced a 60% surge in spending due to renewed interest in nuclear power amid concerns over Russian supplies; and nickel at 45%, led by Canada, where high-grade sulfide resources, proximity to existing infrastructure, and access to low-emissions electricity offered attractive investment opportunities.²

In copper, budgets remain largely focused on Latin America, which hosts the world's largest reserves.³ 2022 saw a 21% increase in spend on copper exploration to US\$2.79 billion (the highest level since 2014) driven by strong prices through 2021 and into the start of 2022. However, persistently high inflation rates as well as a predicted slowdown in economic growth from 3.5% in 2022 to 2.9% in 2024⁴ have affected commodity prices and, thus, dampened projected spend somewhat.⁵

Despite these recent increases, it's important to take a step back and look at the bigger picture. The mining and metals industry is highly cyclical and exploration budgets are intrinsically linked to commodity prices (figure 1). This means that, when prices dip, exploration budgets tend to get cut (and vice versa), and the impact this volatility can have on exploration teams, the success of their programs, and, subsequently, project pipelines can be significant.

Figure 1: Indexed metals prices and exploration spend for nonferrous metals, 1996–2022



Source: S&P Global⁶

"In mining and metals, the percentage of exploration spend over time compared to the size of markets, like copper, is decreasing. The market size continues to increase, but we're not seeing equivalent growth in the funding of exploration."

Charles Hooper, director, Consulting, Deloitte Canada

Additionally, the past decade has seen a shift away from grassroots exploration toward "safer" brownfield sites in established jurisdictions. This stems, in part, from the increasing difficulty and cost of finding quality deposits, which, in turn, has made it tougher for investors to fund riskier early-stage exploration.⁷ Consequently, elevated spending over the past few years has not necessarily led to an increase in the number of major discoveries. S&P Global states that, while volume of supply in copper has increased by 50 million metric tons compared to 2021, most of that increase came from assets that were discovered in the 1990s.⁸

S&P Global reports, "All the new copper came from older, well-developed discoveries ... In fact, we have only been able to identify three additional discoveries over the past five years, which added only 5.6Mt. This is a direct result of companies shifting more of their exploration budgets toward known deposits and existing mines."⁹ It adds that this decade-long tendency could take time to reverse, as most producers have enjoyed record earnings from high copper prices.¹⁰

Balancing investments in growth

Exploration is just one facet of the larger growth conversation, alongside mergers and acquisitions (M&A) and innovation, but it's an important one. M&A is generally more expensive, but less risky compared to exploration. However, with so few significant discoveries coming to light in commodities, such as copper, and an industry-wide shift away from grassroots exploration, sooner or later options for M&A could deteriorate.

To counteract this, major miners may decide to start spending more on exploration instead of relying heavily on the acquisition of smaller exploration companies. Ultimately, both pathways have a role to play in the growth of the mining and metals industry, but finding a balance between the two will likely be key to companies' longevity.

"It takes approximately 15 years for a mine to go from discovery to production. It's important that companies think about their decline curves today and determine the role exploration can play in their strategy to replenish and/or grow reserves."

Charles Hooper, director, Consulting, Deloitte Canada

To change this cycle, organizations could look to better align their exploration efforts with their strategic direction, invest in the attraction and development of talent, and harness technologies, such as artificial intelligence (AI), to reduce the cost of campaigns and speed the identification and evaluation of targets.

Using tech to speed discoveries and lower costs

It's tempting to think of technology as an easy solution to mineral exploration. However, the real value lies in augmenting human knowledge and capabilities, particularly where large datasets are involved.

For example, Curtin University researchers have developed an advanced machine learning tool to help identify undiscovered mineral deposits in Western Australia. As part of the project in collaboration with the Geological Survey of Western Australia, geochemical data collected across the state is being analyzed to reveal patterns that are difficult to see with standard methods. The database contains more than 50 million samples, which would present time, cost, and quality control challenges if examined manually.¹¹

BHP has attributed its Oak Dam discovery in South Australia to applying a combination of "know-how and technology to sift through information that was previously available, but which people had interpreted in a different way."¹²

"Technology provides new tools to help humans do their jobs better and faster. The industry must stay on top of these developments and upskill its current workforce if it's to counteract rising exploration costs, scarcity of new economic deposits, and the retiring technical talent."

**Van Ramsay, partner, Mining & Metals leader,
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Satellite-based technologies are also proving valuable in speeding the identification and enhancing the accuracy of exploration programs. For example, Atlantic Lithium used Fleet Space's ExoSphere satellite-based mineral exploration system during 2023 to conduct geophysical surveys and identify concealed lithium pegmatites within the existing resource footprint at the Ewoyaa lithium project in Ghana.¹³

In time, generative AI (gen AI) could also help to find and summarize information that's important to exploration campaigns, for example, from technical and government reports, and even core logs going back decades as company records are digitalized.¹⁴

Funding higher-risk forms of exploration

Finding ways to fund higher-risk forms of exploration without affecting market capitalization is a topic that's of increasing interest, and one that many major miners have started to investigate in recent years.

BHP's Xplor program is one high-profile example. It is a six-month accelerator program for early-stage explorers looking to fast-track and de-risk their geological concepts and become investment ready. BHP provides funding, coaching, and advice to juniors to ensure technical, business, and operational readiness. Members of each cohort also have the chance to pitch for follow-up funding or BHP relationships.¹⁵

California-based KoBold Metals has another interesting proposition. The company has built what it describes as a "full-stack digital prospecting engine, using computer vision, machine learning and data analysis" that it's applying to find critical minerals. Rather than selling the software as a product, KoBold generates revenue by taking ownership stakes in the mineral resources it discovers. The company already has relationships in place with BHP, which is using KoBold in its search for copper and nickel deposits in Australia, and Rio Tinto, which is working with KoBold on its Winu lithium project, also in Australia.¹⁶

Exploring for a richer future

There are lots of ways that companies can expand their focus on grassroots exploration over the short and long terms, for both their own benefit and that of society. The key to success lies in starting now or doubling down on current efforts to minimize potential critical metal supply deficits, help enable the manufacturing of clean energy technologies, and support the global population.

From ideas to actions

- **Invest in ESG competence:** Access to land is a key factor in grassroots exploration. Investing in appropriate ESG training for teams, both in the field and the office, and implementing leading practices could help manage potential risks (social, financial, and reputational) in the right way.
- **Build relationships in new jurisdictions:** Building relationships with local communities, rightsholders, and governments in emerging jurisdictions that could prove critical to future growth is a solid investment. Understanding priorities, pain points, and where they intersect with company interests could help in securing public support to operate locally if opportunities develop. It could also uncover possibilities to add value, for example, through shared value initiatives.
- **Augment teams with technology:** Consider where strategic investments in technology can be made to complement human talent. For example, AI-based core scanning and logging technologies could free up geologists for higher-level tasks, such as interpretation, and improve orebody knowledge and accuracy.
- **Sustain exploration through cycles:** Leadership and governance are key to sustained exploration efforts. Having a strong voice at the executive table—one who can represent the exploration function, communicate its needs effectively, and explain its importance to the wider organization—could prove critical in maintaining spend through market cycles and leadership changes.
- **Expose talent to exploration:** To understand the importance of grassroots exploration and how it feeds other business activities, graduates, managers, and leadership candidates need exposure to a range of organizational teams and functions. Consider creating a rotational program that provides talent with these experiences.

Endnotes

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