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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.<sup>1</sup> 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.<sup>2</sup> 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 Serbia<sup>3</sup>), 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 economy<sup>4</sup> 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

1. United Nations Department of Economic and Social Affairs, [World population prospects 2022: Summary of results](#), UN DESA/POP/2022/TR/NO. 3, 2022.
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4. Alisha Hiyate, "[Anglo American CEO: '45% of the world's economic activity is driven by the mining sector'](#)," Mining.com, 3 May 2021.



## Trend 2

# Conscious circularity

## The role of mining in a circular economy

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The global economy may be undergoing a metamorphosis. The way that value is defined is changing to support a bid for greater sustainability, as evidenced by the introduction of carbon pricing; environmental, social, and governance (ESG) measures; and the evaluation of biodiversity risk, among other things. Driven by this change, mining and metals companies are beginning to reconsider their traditional roles as metal producers, finding ways to capitalize on previously untapped sources of value and exploring new avenues for value creation.

Change on this scale is daunting, but necessary. The intensification of climate change, environmental degradation, and widespread pollution are products of a linear economic model, one that has reached peak maturity and is starting to fail under the weight of a rapidly expanding population; according to the United Nations (UN), the global population reached 8 billion in November 2022.<sup>1</sup>

A circular economy (CE) presents a more sustainable alternative. It can provide a framework for an economy decoupled from finite materials, while minimizing negative impacts to people and the planet. CE is underpinned by the move to renewable energy and, as the providers of the raw materials needed to create these technologies,<sup>2</sup> no industry is better positioned than mining and metals to lead this change.

### **Much more than decarbonization and waste management**

In general, the mining and metals industry is well progressed in unconscious circularity—the sector has a strong history of waste recycling and water reuse and recycling, and the creation of products from tailings is fast becoming a part of the conversation. The notion of circularity is also being adopted in the energy space with mine electrification and energy storage, and companies have been regenerating landscapes for some time. However, these initiatives are mainly driven by liability, regulation and resource scarcity, rather than by value creation.

## **The positive power of mining and metals**

Early CE adopters should not only benefit from preferential access to responsible sourcing markets and investors;<sup>3</sup> but these companies also have the opportunity to influence those downstream, accelerating the growth of the wider circular economy. Mining, minerals and metals form the start of many different supply chains, from steel used in wind turbines to potash and phosphates used as fertilizers. The way in which the industry operates and conducts itself sets the standard for what follows.

When it comes to “conscious” circularity and shifting mindsets around value and materials reuse further down the value chain there is still much work to be done. Since the linear economy drives the need for mining, many perceive CE as a threat to their industry as it is now. Systematic change is often considered risky, too costly, or simply too difficult; a view which usually results in inaction.

Georgine Roodenrys, partner, Sustainability & Climate Change National Circular Lead, Deloitte Australia explains: “As a result, the mining and metals industry as a whole is relatively unaware of what a CE proposition can provide. Of course, this is not true of all. Collectively, the industry still has a long way to go, but because these companies already have a lot of the fundamental skills and technologies needed for CE, they are well placed to move quickly.”

There is also relatively little in the way of practical resources specifically designed to help mine operators reconfigure their businesses in a gradual and manageable way to ultimately support the creation of a sustainable ecosystem. The result is that steps toward CE in mining so far have tended to manifest as waste management and decarbonization projects.

While these types of efforts are important steps toward CE, to implement them in a siloed manner or as stand-alone company initiatives is to miss the very point of circularity. To reap the full benefits of CE, each step within the mining and metals system should be reconfigured to keep metals in their most valuable form, design out waste, and maintain the health of the physical environment.

Despite the incumbent challenges, the industry and its collaborators should accelerate their CE journey today to support the drive toward global sustainable economic transformation.

## Relearning value and its circulation

The first step is to better understand value and that value creation is intrinsically linked to organizational business models. In the case of traditional mining and metals companies, their value and growth are based on the exploitation of finite resources and the creation of financial value for a narrow group of stakeholders. However, miners of the future are expected to provide many different types of value, including social and environmental. This involves not only mitigating negative impacts but actively creating positive impacts.

CE can enable this through three key principles:<sup>4</sup>

1. Design out waste and pollution;
2. Keep products and materials at their highest value;
3. Regenerate natural systems.

CE centers on value retention. In a linear system, chain, or process, value is often incrementally lost along the way. Mine tailings are a good example—the value invested in creating tailings is lost the minute they separate from the product, often becoming an immediate cost-management exercise. Companies are beginning to realize the value held within residue minerals and to explore ways to capture it through reprocessing or divergent product streams.

In a circular economy, the system is optimized to design out value leaks or turn them into loops. Retention of value is also a cost-avoidance exercise. For example, tailings storage facilities must be managed far beyond active operation and represent a massive financial and social liability for operators.

Tailings are just one of many examples of how value can be lost or retained in a metals-focused ecosystem. Examples such as this make it easier to see how adopting

circular principles could help companies to generate a competitive advantage through lower costs, fewer regulatory constraints, better ESG scores and securing a social license to operate.

A critical part of the shift to CE lies in how we measure nonfinancial value, such as biodiversity or trust. It's difficult to build a solid business case for CE initiatives if we cannot fully communicate the value they deliver. Currently, businesses are simply reacting to the costs associated with these "externalities." Digital transformation will be key in this respect, aiding with quantifying and modeling value flow throughout value chains today and ecosystems tomorrow.

### Think systematically

Viewing business activities and operations as part of an interconnected ecosystem also allows investment in the appropriate innovations across business models and portfolios. This gives companies a better understanding of the risks and opportunities surrounding them<sup>5</sup> and allows them to create meaningful value in the areas where they operate. This knowledge is important in building resilience at many levels of an organization, in attracting new sources of investment and entering new markets.

Andrew Lane, Partner, Energy, Resources & Industrials Leader, Deloitte Africa says: "There's huge potential risk and opportunity for circularity in mining. But most mining companies do not understand that this is an economic proposition; it's about their place within the global economy, as opposed to them implementing the next wave of sustainability initiatives."

### New models for new value

The scaling of green financial tools, such as biodiversity markets, will encourage mining and metals companies to create new value streams (e.g., through environmental regeneration) and bolster the development of new CE-based business models.

It is easier to instill circular principles into a new business, but there are also examples of traditional mining and metals companies that have successfully pivoted their business models to embrace CE. Anglo American is applying circular principles to optimize its use of resources, eliminate physical waste, and maximize process efficiency at its operations. The company aims to have a neutral or net-positive impact on the environment which, in turn, helps local communities to thrive.

Through its value chains and marketing business, Anglo is working to maximize the value of its products during their life cycle, and it actively supports the development of new technologies that advance this goal. The company summarizes the importance of CE to its evolution in the following statement: "Through holistic business transformation, we are growing our business in ways that adapt to and shape the change around us. Circularity is one of the lenses that we use to support our journey from mining and metals company to material solutions provider."<sup>6</sup>

Patricia Muricy, Partner, Energy, Resources & Industrials Leader, Deloitte Brazil adds: "There are only three principles required to create a CE, and we already have the framework needed to effect change. The key lies in changing mindsets and breaking down the challenge into manageable chunks, examining how we can apply those principles at every level within mining and metals companies. To do that successfully, there must be recognition that a systemwide shift is required."

### Time for change

Rethinking the flow of value throughout the metals and minerals ecosystem is one of the biggest opportunities this sector has to positively influence sustainable development, both today and tomorrow. The journey will not be easy, but organizations that are willing to try will likely be rewarded tenfold through greater longevity.

## Initiating and accelerating circular economy in mining and metals

- **Get strategic:** As part of organizational strategy setting, consider how the company defines and measures value today. If the current system doesn't accurately reflect nonfinancial forms of value, explore how it could be rethought to support the creation of CE-centered business cases. By questioning what is valuable today versus 10 years ago, and what will be valuable in another 10 years' time, businesses will be better positioned to build circular principles into their core strategies.
- **Map the value ecosystem:** It is likely that most mining companies will already be mapping their sphere of influence as part of their Scope 3 emissions reduction efforts. Use that exercise to consider value flow throughout the known ecosystem of suppliers, customers, stakeholders and environments. Identify the roles that the mining company plays in each scenario, as well as threats and opportunities to value retention. Understand the gaps that could present an opportunity for a new product, service or alliance.
- **Invest in the appropriate people and partners:** Consider whether the organization currently has the knowledge and capabilities needed to apply circular principles and close any value leaks. Be strategic about those roles and identify where investment is needed to build a resource inhouse or outsource to a business whose values are aligned.
- **Scale current successes:** Circular principles can be applied at every level within a mining and metals business, from the process level all the way up to enterprise. Companies are good at applying circularity at the process level; for example, using closed-loop water circuits to reduce loss through mineral processing. Where leading practices currently exist, replicate and scale them across the business. Sharing these examples and learnings, both internally and externally, will also accelerate the industry's collective impact.
- **Act fast to safeguard market share:** To help ensure mining and metals companies maintain competitive market share, CE should become a core strategic imperative. Many traditional mining companies of all sizes are pivoting to embrace circularity, and there will be new entrants in the coming years. There is also the threat of rising costs as ore grades decline.

# Endnotes

1. United Nations Department of Economic and Social Affairs, Population Division, [World population prospects 2022: Summary of results](#), UN DESA/POP/20222/TR/NO. 3, 2022.
2. Ellen MacArthur Foundation, "[Circular economy introduction](#)," accessed 8 September 2022.
3. Alan Young, Maria Laura Barreto, and Karen Chovan, [Towards a circular economy approach to mining operations: Key concepts, drivers and opportunities](#), Natural Resources Canada (NRCan), December 2021.
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