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Tracking the trends 2022

Redefining mining

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Introduction

Redefining mining

What will successful mining and metals companies look like in a low-carbon, low-waste, purpose-driven future?

The beauty of this question is that there is no definitive answer. While the core objective of the mining industry remains unchanged going forward: to extract and provide metals and minerals to downstream sectors, many of the factors that have influenced how mining companies should look, feel, and act in the past, have shifted in recent years.

The way in which companies fulfil this mission is now open to interpretation. And today, there is a rare opportunity for leaders to reorganize, generate new value, and forge partnerships to create a more responsible and attractive future for the industry.

While some early movers saw the need for change coming 10, 15, even 20 years ago and have been redefining their organizations and operations accordingly, for many firms, the necessity for fundamental change only really hit home in 2020-21. The convergence of factors including the ongoing effects of the COVID-19 pandemic on the world of work, continued drive towards digitization, the growing need to integrate ESG commitments with central business functions, and the need to pivot in response to fast-moving business and operating environments, has opened many choices for companies.

Of course, the biggest underlying driver and opportunity for transformation lies in the green energy transition. The 2021 United Nations Climate Change Conference (COP26) held in Glasgow in November, highlighted the mining industry's integral role in supplying the metals and materials critical for a low-carbon future¹. The way in which mining companies position themselves today in preparation for this change, will determine their sustainability, and could make or break their competitive advantage over the next decade.

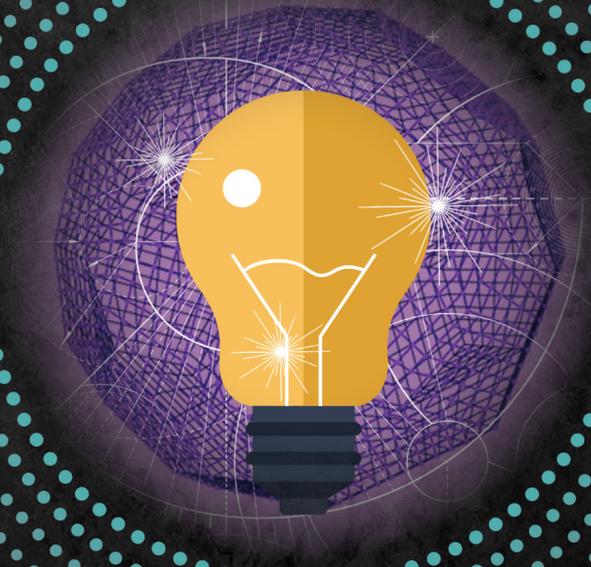
Change on this scale is undoubtably daunting, which is why in this, its 14th year, Tracking the trends has focused on effecting transformation. The following 10 trends provide a toolkit to help mining companies start thinking through, and moving towards, their vision of future success.

In them, our global team of experts share insights and case studies designed to get ideas flowing. We explore how to evolve traditional mining and metals businesses through new business models, capital allocation, agile work practices, and data-driven technologies to create organizations fit for the 21st century; ones that can not only survive but profit from whatever the future might throw at them and leave a positive social impact in their wake.

The next decade will be one of the most exciting and transformative in the mining industry's history. We look forward to discussing the trends with you and supporting your company on its journey. Thank you for your ongoing support.

Endnote:

1. Judith Magyar, "COP26 Takeaways: Renewables Replace Fossil Fuels As Metals Become A Major Force", published 28 November 2021 <https://www.forbes.com/sites/sap/2021/11/29/cop26-takeaways-renewables-replace-fossil-fuels-as-metals-become-a-major-force/?sh=948a2f626763>, accessed 3 December 2021.



Trend 7

Continuing the journey toward innovation-led organizations

Moving to action by embracing the change

Steven Walsh, Mining & Metals Leader, Deloitte Australia

Roland Labuhn, Partner, Consulting, Deloitte Canada

The topic of innovation is no stranger to Tracking the trends. It has long been on mining companies' agendas, but, for most, integrating the process of innovation with core business functions and operations has proven tricky. Fundamentally, this is because, rather than being structured to embrace change and benefit from it, traditional mining companies and processes are designed for stability.

So, why raise it now? A number of factors have recently converged, driving executives to embrace innovation and align their organizations behind it:

1. COVID-19 forced the world to embrace digital and remote work practices, changing the world of business for good.
2. Mining companies will need to innovate within their core processes if they are to decarbonize in line with their goals.
3. It is much easier to fund innovation while commodity prices are high and the industry is benefiting from the supercycle.

Digital transformation—or the shift from mainly separated physical systems and technologies to integrated virtual, data-driven ones—offers huge opportunities in every instance. It provides a means to leverage data for enhanced decision-making, quickly simulate changes to the value chain, and analyze the impact of new technologies and designs in advance of implementation, among many other benefits. It will also open the doors to a new generation of fresh, diverse talent with the vision and cultural expectations required of more agile mining and metals organizations.

Over the years in Tracking the trends we have spoken about putting in place innovation-capability systems, operating in ecosystems, moving toward integrated operations, and addressing different organizational barriers to innovation. We still believe the time is ripe for change, and this year we focus on some of the areas where we continue to see organizations struggle.

Challenging the status quo

It takes visionary leadership, right from the top, to

create an organization that is able to question industry-standard processes, test different ideas, and implement new ones without fear of failure.

Mining project delivery is one area that could benefit significantly from innovation, yet the status quo remains unchanged—cost overruns on construction projects in the energy and resource sector, including mining, typically exceed 30%.¹

Steven Walsh—Mining & Metals Leader, Deloitte Australia, says, “Traditionally, in project delivery, we see designs that were originally created 50 years ago, or more, that have been progressively updated, rather than starting from first principles and innovating. Part of the problem is that, in traditional mining projects, after first ideation and the vision setting phase of a project, almost every process after that is designed to eliminate risk and therefore also eliminates innovation.”

Progressive leadership combined with realistic target setting, use of different models, and better communication between teams offers the opportunity for mining projects to be more efficient and less capital intensive. To achieve this, traditional approval and delivery processes must be challenged and refreshed.

Learning from other industries

There are other asset-intensive industries, particularly those with complex logistics chains, that can offer learnings and inspiration around innovation for mining. For instance, transport and logistics operators often have lower margins than those seen in mining, and have used this as motivation to adopt new innovations that offer greater efficiencies.

There is also much that could be learned from the agile ways of working employed in the technology and financial services industries. For example, in a financial services organization, the last step in an innovation project will often be to deploy software or a new rule or policy—something that can be done at the touch of a button—whereas, in mining, a physical piece of equipment usually needs to be installed.

The innovation emphasis in mining therefore tends to be skewed toward equipment or technologies, and these projects take time. But it's worth remembering that this is only one piece of the puzzle; efficiencies and opportunities can be achieved more rapidly through innovative processes, policies or systems. Again, this emphasizes the need for a holistic approach to innovation initiatives.

Creating a culture of innovation

In an industry that measures its success through delivering to targets, trying something different that might temporarily lower production can be frowned upon. But planning in an acceptable level of risk is key to testing and deploying new solutions. Companies that are good at innovating will have a wide risk tolerance, and will allow for production fluctuations when testing an idea that could prove valuable.

Much of this relates to culture and how success is measured, not just at company level but also at industry level. Unlike in safety, where risk of any kind is unacceptable and, therefore, controls are added and very rarely removed, in mining innovation, there are two types of risk: risk of failure and risk of success—and both are equally valuable.

Because mining companies are more familiar with risk around safety and the industry's measures of success is geared towards higher production, there is a reticence to remove controls that hinder innovation in case something 'goes wrong.'

Roland Labuhn—Partner, Consulting, Deloitte Canada says: "In some ways, this culture is now holding us back, because we can design and develop new innovations, and model them with technology, but at some point they need to be tested in operations. Companies that can plan for minor interruptions and incentivize their teams to both achieve production targets and successfully innovate, will realize greater opportunities to learn and improve ahead of their peers."

Problem-solving around things that occur today should be automatic, and planned well in advance. To really move the dial in innovation and become truly agile, companies should be focusing on solving problems that are three months away or more.

Workforce evolution will also serve to accelerate innovation culture in mining. Companies are already seeing workers come through who are frustrated by the willingness of current generations to adopt new ideas. This will only accelerate as zoomers move through the ranks. Greater innovation will, in turn, increase workforce diversity and boost retention through job satisfaction.

Walsh adds: "I'm a passionate believer that differences in thinking and background are critical to innovation, and anything we can do to make mining more attractive and

inclusive to a broad range of people will result in more innovative ideas. In any conversation about innovation, we should be looking around the room and challenging ourselves on how diverse the thinking really is."

Innovation in action

OZ Minerals' Think & Act Differently, (TAD) virtual incubator is focused on unlocking opportunities to shape a vision of the mine of the future. Over the last year, they have supported innovators from around the world to propose and pursue short experiments that are providing the industry with some early knowledge, around future trends.

The focus of TAD has been on five themes; clean products, energy and emissions, data and technology, scalable and adaptable mining and waste and water. In 2021, TAD ran crowd challenges against each theme to obtain new and divergent thinking. OZ Minerals' General Manager Transformation, Katie Hulmes, explained, "What's clear is that even in areas or subjects we thought we knew a lot about—we're finding many people we were not aware of who are working on potentially breakthrough technologies. They might also have a different way of looking at a problem we have been trying to solve. The team is excited about continuing to work with innovators to complete their challenges and consolidate learnings to understand our gaps and opportunities".

Making innovation a core part of mining businesses

- **Challenge policies and controls that stand in the way of agile principles:** Mining organizations have multiple layers of controls to ensure actions that are dangerous, inefficient, or could negatively impact productivity do not occur. These are important, but, for the purposes of ideation and problem solving, staff should be encouraged to challenge controls and policies that stand in the way of agile principles and ask the question: 'why not?', rather than 'why?'
- **Accept some short-term reductions for longer-term improvements:** In truly innovative companies, there will be times when testing new ideas means sacrificing production, and that's ok. If there is a relentless focus on maximizing the numbers, it discourages the next wave of innovation. Leaders should put systems in place to encourage and reward both short-term performance and longer-term improvement.

When failures happen, teams should be supported to analyze, assess, and document them from a value perspective; a failure is only truly a failure if we do not learn from it.

- **Don't underestimate change management:** To get the full value from a new technology or business offering requires its integration with other systems, technologies, and procedures, and adoption by the workforce. Approximately 30% of the innovation effort could be dedicated to the period after deployment to make sure the change is effective. Innovation processes and budgets should reflect this, and allow for ongoing training for personnel.
- **Take low-hanging fruit:** Success inspires further innovation, and if there are quick, cheap changes that will generate fast returns (even if a technology or system will be replaced in a few years), then consider taking them. Innovation teams also need to be incentivized to hand projects over to operations before moving on to the next, rather than becoming attached or obsessing over perfectionism.
- **Structuring research and development (R&D) teams:** There have been multiple instances where mining companies have invested heavily in establishing R&D teams that are distanced from their operational counterparts, with varying degrees of success. However, this is rarely an optimal approach. Instead, consider embedding innovation functions or roles within operational teams.

Endnote:

1. "Between a rock and a hard place: Addressing distress in the mining industry," Deloitte <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/energy-resources/ca-en-energy-and-resources-between-a-rock-and-a-hard-place.pdf>, accessed 2 December 2021.

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