



Its Your Turn: How Small- to Mid-Tier Mining Companies Can Win the Innovation Race



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Prior studies have highlighted the challenges to ramp up productivity in the Mining sector. Mining companies are struggling to be sufficiently profitable and to satisfy investors with the returns on capital, despite prices being 3 to 5 times higher than the lows of 2000. While pricing and increased extraction of deeper or lower grade ore are contributing factors, a significant threat to mining's growth is its innovation deficit: the lack of application of technologies proven in other industries, and the slow speed from idea to adoption and scale.

This is exasperated by recent events such as Vale's tailings dam collapse in Brazil at [Córrego do Feijão](#), which resulted in the deaths of an estimated 300 people and highlighted the significant safety challenges for mining companies. This is in addition to other health and safety risks, such as diesel emissions, water scarcity and pollution, dust, noise, and chemical hazards.

When you consider the imperative to address rising environmental concerns from the use of energy and water, and decreasing carbon intensity, mining companies face increasingly significant challenges.

THE TIDE IS STARTING TO TURN, BUT NOT SUFFICIENTLY AND NOT FAST ENOUGH.

Mining companies are starting to respond to these challenges through innovation. As Anglo American's FutureSmart initiative puts it, "In this world of rapid, powerful change, the world belongs to those who can redefine it and – in mining – today's pioneers are tomorrow's winners." FutureSmart Mining is Anglo American's innovation-led approach to apply new thinking and technological advances to address mining's challenges. Similarly, BHP has outlined its vision for technology to enable the company to become fully integrated and highly automated from resource to market by 2025. Teck Resources is looking to reinvent itself and mining through its new program Ideas to Work, where it hopes to identify and put new ideas to work across exploration, project development, mining, reclamation and closure. These are more recent examples than Rio Tinto's Mine of the Future program, which achieved some notable advances but was dogged by over-investment and a proprietary approach, subsequently cut back, and reinstated as its Growth and Innovation function.

These are the few examples of companies meaningfully turning aspiration into action, but is this sufficiently broad-based across the industry? We think not. The mining industry has had persistent under-investment in innovation over the last 15 years, by a factor of five or six behind manufacturing, oil and gas. Professor Emeritus Tim Napier-Munn, former Director of University of Queensland's Julius Kruttschnitt Mineral Research Centre, states that innovation should be viewed as

non-discretionary, and there is both the obligation and the opportunity for the industry to be more creative and to do so more efficiently.

Napier-Munn highlights challenges to innovation stemming from indiscriminate cost cutting, viewing innovation as a liability rather than an asset, inertia to change and too much comfort with existing processes, short-termism, and risk averseness.

SO HOW CAN SMALL- TO MID-TIER COMPANIES STEP UP THEIR INNOVATION GAME?

While Rio Tinto and other large miners have invested up to hundreds of millions, we believe small to mid-tier mining companies can also effectively undertake transformational innovation at a rapid pace without requiring huge investments. The key is to be smart in where and how they innovate, and to use their natural speed and entrepreneurial culture to their advantage. These are the key ingredients to creating a successful lean and agile innovation organization:

1. Focus your **innovation efforts on the highest value opportunities**, but also include early wins that can demonstrate your ability to **get innovation done**. Utilize **rapid ideation sessions** focused on your highest value problems to identify these opportunities, and include a wide range of participants - from operations, technology, planning, etc. - as appropriate. Bring in external participants to **challenge conventional thinking** and get inspiration from other industries.
2. Build a **culture that embraces innovation through learning**, with the burden of the business case that reflects the investment level required. Structure early stage innovation as **low-cost learning efforts** and **short sprints** in a lower risk environment, such as in a lab or non-production site. Get creative to keep those early learning sprints as **low cost** as you can with **clear metrics for learning and pivoting** your approach. Keep those efforts **focused on addressing the most critical uncertainties** and assumptions; don't start working on all the things you already know how to do well until critical uncertainties and assumptions are resolved.



3. Adopt a **lean** and **minimum viable everything (MVx)** approach - from how you structure your learning sprints, to **avoidance of overburdening governance and process**, and working with external partners. Don't let your partners spiral into the procurement death trap for early stage efforts.
4. Adopt an **innovation toolkit** to manage your innovation efforts more effectively. **Cloud based innovation management software** brings best practices in an accessible and affordable package and helps optimize performance.

We believe that the above ingredients can be distilled into a fit for purpose and lean innovation approach for small- to mid-tier mining companies, and that they could deliver more value faster than larger miners. The investments required to achieve this are relatively small in comparison to the cost and risk of doing nothing in the face of mounting challenges - mining companies simply can't afford not to innovate.



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Our clients choose Clareo when they want bold new ideas that get to market faster. Working alongside our clients, we create compelling strategies that lead to action.

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