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Innovating in tough times

Funding is always going to be a concern for any technology in the sector

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Above l-r: AngloGold Ashanti's reef-boring technology. John Thompson… sees opportunities in the industry today despite its falling profitability

Mark Cutifani's stark warning that mining companies need to get better at technological innovation – or risk being absorbed by those that do – has been echoed throughout the industry for years.

The amount of genuinely new technology that has been developed by the mining industry in the past 20 years could be counted on two hands. Even on the rare occasion that companies do develop something new, the uptake from the wider industry is incredibly slow.

Chrysalix EVC, a Canadian technology venture-capital fund focused on resource productivity and clean energy innovation, has seen the transformational effects that technology can have on an industry, having partnered with oil and gas majors Shell and Total to find solutions in those sectors. It receives about 800 proposals a year from entrepreneurs, backing only the ideas that can have a real impact on industry. It then works with organisations and investor consortia to get the idea and prototypes in front of decision-makers.

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Chrysalix EVC's mining industry adviser John Thompson saw opportunities in the industry today, despite its falling profitability.

"The industry's need for lower costs, decreased energy consumption, and improved productivity will be the major driver for innovation," he told *Mining Journal*. "Companies want to maintain their operations in the lower-cost quartile and the leaders will have to be willing to innovate and manage associated risks to achieve this goal."

Charlie Haythornthwaite, partner at Chrysalix EVC responsible for the venture-capital fund's mining innovation activity, said: "Perhaps the most exciting new mining technology start-ups in the short term are single components that can make great financial impact which plug and play into the existing system around it."

Haythornthwaite marked out one technology in the company's portfolio, MineSense, as an example of this. The sensory technology developed by the start-up company could detect ore from waste, which could be used for separation purposes. It could fit into existing flow sheets with ease, he said.

Technology of scale was still clustered around the main mining hubs, according to Thompson. "Major mining jurisdictions [such as Australia, Canada, Scandinavia, Chile and Brazil] will generate the most activity which is likely to cluster around mining and innovation centres, particularly those that develop synergies among several sectors – geoscience, mining, energy, IT and communication, aerospace and biotechnology," he said.

"Large-scale testing facilities are needed for meaningful pilot and demonstration-scale work. Such facilities are traditionally located in government facilities and these may therefore become the focal point for clusters," he added. Examples include the Centre of Excellence for Mining Innovation (CEMI) in Sudbury, Canada and the Australian Resources Research Centre in Perth, Western Australia, both of which have funding from industry and government.

Much of the recent work in these centres has focused on automation, but most of this has been developed to take people out of the pit or underground in order for machines to replicate what they previously did. The process of what companies are doing has not changed.

"The greatest innovation… will occur where automation facilitates enhanced selectivity and significant changes in mining costs and efficiency,"

Charlie Haythornthwaite… single components like MineSense that can make great financial impact are the most exciting start-ups

Thompson, who is also president of the Canadian Mining Innovation Council (CMIC) and former vice president of technology and development for Teck Resources Ltd, said.

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While explaining that there was "no shortage of speculative capital for the resource sector", Thompson admitted that innovation funding was still lacking. It and its partners in mining were looking at raisings tens of millions of dollars, much akin to similar sums raised in Australia, South Africa and Chile, but hundreds of millions of dollars was really needed for big innovation.

And it was not only the funding situation that needed to change. The sector's approach to step change innovation needs to be reassessed. "The challenge is to find the most forward-thinking mining companies and the individual champions that recognise the strategic value of innovation and the benefits of being among the early adopters," Haythornthwaite said.

In a climate where companies are punished for delays or problems associated with the implementation of technology, it is hard to find many CEOs or companies willing to stand out from the crowd and back innovation.

Cutifani himself did this at AngloGold Ashanti Ltd with the company's reef-boring technology, which is starting to show promise and potential for the industry as a whole. But the companies with arguably the biggest budgets to invest, such as Anglo American plc, are often the ones with the most demanding shareholders that at this time are craving discipline. As usual, the conundrum continues.