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## **Impact of global change on resources – exploration to markets**

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Resource demand is impacted by population growth and fundamental human needs, emerging markets, and societal expectations. Economic cycles and volatility are the norm. The current downturn followed an extended super cycle, and while the present market does not appear to appreciate resource exploration and development, the world will need new discoveries in the not too distant future. The question is more about when and how individual markets will react?

At the downstream end of the market, we are also seeing rapid change. Drives for efficiency, new sources of energy, materials for light weight vehicles, batteries and fuel cells all offer increasing demand for select metals and materials, many of which are not the typical products for the majority of mining companies. How fast will these changes and markets emerge and who will be the major players?

Regardless of changes in demand, it is clear that civil society will expect a standard of living that includes power, water, communication and clean air. Resource extraction may be accepted as necessary, but the expectation will be that this is done in a clean and efficient manner, will provide employment, and will clearly benefit the communities most effected. This will require changes in resource partnerships, business models and operations. Above all else, these challenges require a focus on quality – from discoveries to operations.

Making quality discoveries is, however, harder than ever both from technical and non-technical perspectives. While it is often argued that discovery rates in general are in decline, there is little doubt that quality discoveries are becoming increasingly rare – quality being defined by normal measures such as size and grade, but also in terms of access, mineability, environmental performance and social acceptance. There are well recognized elements for successful exploration involving a mix of traditional field-based approaches, use of appropriate technology, and creative persistence. The next generation of discoveries, however, will require further innovation including changes to major-junior company business models, partnerships with local communities, new geological models focused on target definition, the use of technology to see to greater depth, and new drilling methods that provide faster and cheaper tests of exploration targets.

In addition to new quality discoveries, the focus must also be on developing quality operations where more value is created from less rock rather than the reverse. New more selective technologies, reduced energy and water consumption, and efforts to reduce waste are critical. Interestingly, global changes in the digital world, new materials, energy efficiency and restrictions in water use may both impact demand for resources and also benefit mining operations by increasing efficiency, environmental performance and acceptance.

Whether we envisage major or modest changes to future resource exploration and development, the reality is that the world around us is changing fast and the rate of change will increase. Changes will touch everything from material and metal use to the nature of work and the availability of talent.

Clarity, flexibility and adaptability will be vital to the success of the resource business and the supply of resources to meet future needs.

