

Climate proofing mining operations

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By nature, mining activities are resource intensive, and by coincidence they are often located in geographies particularly vulnerable to climate change.



Image source: Getty/Gallo

To address these issues, mining company executives will need to ask themselves three key questions:

1. How can we reduce our direct and indirect carbon-emissions footprint?
2. How can we ensure operational resilience to the effects of climate change (e.g., water scarcity)?
3. How can we make climate issues integral to our business decisions, and how can we structure incentives and rewards to drive those decisions?

As with designing a climate-conscious, scenario-based business strategy, to climate-proof operations mining companies will need to conduct future scenarios to gauge the possible implications on operations. The more diverse their options for responding the better they can craft robust strategies for managing uncertainty around different types of emissions, which vary considerably across commodities.

Six emission reduction levers

Mining companies have six main emission reduction levers at their disposal and should try to work several simultaneously. For example, European steel players are investigating processes to avoid, reduce, and reuse CO₂ emissions. They “avoid” through innovative replacement of carbon with hydrogen from water electrolysis. They “reduce” by adopting more CO₂ efficient technologies. And they “reuse” by utilising process gasses for chemical products, such as bioethanol, fertiliser, synthetic fuel and polymers.

While most mining companies have programmes aimed at reducing greenhouse gas emissions and fossil-fuel burning (e.g., by switching to less contaminating fuel such as natural gas), several have taken additional steps and focused on process innovation. Lithium Australia, for instance, has developed a way to extract lithium with less energy-intensive and contaminating processes. Meanwhile, Northam Platinum has implemented a closed water circuit to ensure that 90% of the water used in its operations is recycled.

And Barrick Gold is using naturally occurring geothermal properties to improve underground ventilation, thus reducing heating in winter and cooling in summer. According to the company's 2018 sustainability report, these efforts reduced greenhouse gas emissions by 24%, and lowered energy consumption by 10% (as measured by ventilation per ton of ore).

The right partners

Of course, every company's circumstances are unique. Understanding exactly which of these six reduction levers to use, how to apply them, and in what sequence is no simple task. Setting up dedicated centres of expertise and data can help assess abatement potential, constraints and costs. Mining companies should also remember they don't need to do it alone. The right partners can bring valuable expertise and capital to develop and accelerate new technologies, which in turn can help the company respond faster to market changes. Whatever emission reduction plan the company chooses, however, it must manage the plan with the same rigor as a typical cost reduction plan.

When climate-proofing the operations, there is also the very practical matter of building resilience into operations so the company can recover from sudden climate-related disasters. Ensham's decision to build levee banks around its central Queensland mine helped the mine avoid flooding during the wet season in 2010-2011. Two years earlier, it had suffered \$300m in damages when several coal pits were badly flooded. And since mid-2017, Barrick Gold has integrated digital weather forecasts into water-usage models at its South American sites to more accurately predict weather-related water risks (such as reservoir depletion or floods) in real time.

The increase from investors and regulatory bodies on mines to disclose their contributions to climate change and plans to mitigate emissions, will receive continual scrutiny, until an implementable climate-conscious, scenario-based business strategy is developed and acted upon.

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