Adapting the mining sector to climate change: A web-tool for climate-resilient resource development

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# ABSTRACT

Climate change is a growing reality, manifesting through unprecedented rainfall extremes, intensifying heatwaves, and other physical impacts. The mining sector faces significant climate-related risks across all stages of the mine life cycle - from designing resilient infrastructure (e.g., mine waste storage facilities capable of withstanding extreme rainfall events) to planning for closure (e.g., selecting vegetation suited to evolving climate conditions). To ensure long-term sustainability and resilience, it is crucial to integrate climate risk considerations into mine planning and operations.

This presentation introduces a new online web-tool developed to support climate-resilient resource development in Queensland. As part of the Queensland Future Climate science program’s *Adapting to Future Climate* case studies, the tool serves two primary purposes: (i) educating stakeholders on climate risks specific to the mining industry; and (ii) providing a foundation for discussions on industry preparedness for future climate conditions. The web-tool translates the findings of two key research papers into an easy-to-read format, featuring interactive conceptual diagrams, time-lapse videos and an interactive dashboard with maps and charts teasing out future impacts across Queensland’s mining regions. It is structured around five key components:

1. Mining and decarbonisation in Australia
2. The climate sensitive mine life cycle
3. Assessing climate change risks to mining regions
4. Understanding future climate projections across mine sites
5. Climate resilient mine site planning and design

Finally, we discuss ongoing efforts to expand the tool’s application to mining regions across Australia and the planned transition from CMIP5 to CMIP6 climate data to update and enhance climate risk assessments.