

The impact of enhanced ESG outcomes on the optimal open pit to underground transition

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Environmental, social, and governance (ESG) considerations have become a critical matter for the minerals industry. Today, ESG credentials permeate every aspect of minerals projects, influencing everything from initial project evaluation through to operations and mine closure, and overarching corporate governance objectives.

The decision to transition from open pit to underground operations is a multifaceted challenge, devoid of a one-size-fits all solution. Traditionally, this decision hinged predominantly on economic factors such as mining costs, and technical risks with open pit mines often perceived as offering greater certainty compared to their underground counterpart. However, underground mining typically encompasses many material advantages from an ESG perspective. These advantages include a smaller environmental footprint and lower societal disruption.

Consequently, integrating ESG considerations into the evaluation of the optimal transition point from open pit to underground operations, may accelerate the transition, and lead to a smaller open pit and the earlier development of an underground mine.

This paper identifies the range of technical, technological, and economic factors that influence the determination of the optimal transition point from open pit to underground mining. Further expanding on conventions through extensive practical experience, case studies and advanced modelling techniques, the authors will demonstrate the substantial impact that achieving better ESG outcomes has on this critical juncture.