

Developing bottom-up understanding of primary copper supply under the shared socio-economic pathways

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Abstract

Demand for some metals (e.g. Cu, Li, Ni) may rapidly grow as we pursue decarbonisation through electrification and renewable energy roll-out. Prevailing approaches to scenario modelling of material supply and demand utilise highly aggregated, top-down data sources and methods. This produces results useful for understanding general trends, but that may have limited ability to inform more detailed questions of relevance for government policy makers and industry stakeholders. These go beyond the simplistic question of “will we run out of a mineral” that has been the focus for much modelling in the past, and extend into more specific questions such as how many new production facilities have to be opened by year x and what investment is required? What are the potential environmental and social impacts? Or how will development of different deposit types influence co-product mineral supply? In response to this, we developed the Primary Exploration, Mining and Metal Supply Scenario (PEMMSS) model to allow a bottom-up evaluation of deposit discovery, mine development (and closure) and co-product recovery requirements necessary to meet long-term material demand. The model is designed to interface with primary demand outputs of broader models for socio-economic material metabolism. As an initial application, we assess how primary copper supply may evolve in response to long-term demand and different resource efficiency strategies under the second shared socio-economic pathway (SSP2).

Speaker Biography

Dr Stephen Northey is a Chancellor's Postdoctoral Research Fellow at the UTS Institute for Sustainable Futures. In this role he is focused on understanding sustainable development outcomes in the minerals industry by developing both new approaches to scenario modelling, as well as the foundational methods and datasets required to benchmark industry environmental performance. In prior roles with Monash University and CSIRO, he has assessed the global supply and demand of mineral products, evaluated water and energy consumption throughout the mining industry, and conducted techno-economic and life cycle assessment studies of novel mineral processing and metal production technologies.