

Prospectus brief INVITATION TO PARTICIPATE

Innovation to generate value from minewastes

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What is the challenge?

A major sustainability challenge facing the mining industry is the generation of large volumes of solid wastes and wastewater, which present environmental, safety and social issues. This challenge is increasing as the demand for new-economy minerals grows, ore grades decrease, and legislative and community pressures increase. However, these wastes contain valuable, residual or secondary products that could be extracted and could lead to economic development for regions in transition.

When classified as wastes, these products become liabilities for mining companies and host communities alike and opportunities for value creation can be missed. A circular economy approach to characterisation, reprocessing and utilisation of wastes can lead to a step-change in managing waste volumes, delivering additional value from minesites and identifying potential new industries that can be part of a transition, in some cases commencing prior to mine closure.



Opportunities for Co-design

Through this initiative:

- Systematic approaches underpinned by circular-economy thinking will be developed into decision tools to identify the most suitable pathway to reduce mine waste volumes in different contexts. These pathways might include: mineral extraction, tailings dewatering, tailings water recovery and treatment, waste transformation into geopolymers, bricks and sands for construction, mine void backfilling using waste, and engineered topsoil for agriculture and rehabilitation
- Innovative solutions such as algal biotechnology will be developed to enable multiple bio-based supply chains and provide nutrients (e.g. for use as plant fertilisers) while sequestering carbon dioxide from the atmosphere
- Manufacturing and supply chain opportunities using recycling science will be considered

There are opportunities to engage in the development of projects addressing these issues through scoping studies and industry workshops.



Background

Increasingly, innovation is being developed to address the large volumes of solid wastes and wastewater generated in mining, address the environmental, safety and social issues that arise and realise value from the use of materials contained within the waste to support economic development for regions in transition. Additionally, new global standards for the management of tailings have emerged and the International Council of Mining and Metals published a report recently on the role of [mining and metals in the circular economy](#). This publication lays out the characteristics of a circular economy and examines the context for the growing interest in this concept. What is clear is that the delivery of a circular economy will require a shift in how we think about the use of minerals and metals from a production-disposal mentality towards on-going use and re-use. Enabling this shift can arise both from the development of new process technologies and from different combinations of existing technologies and concepts.

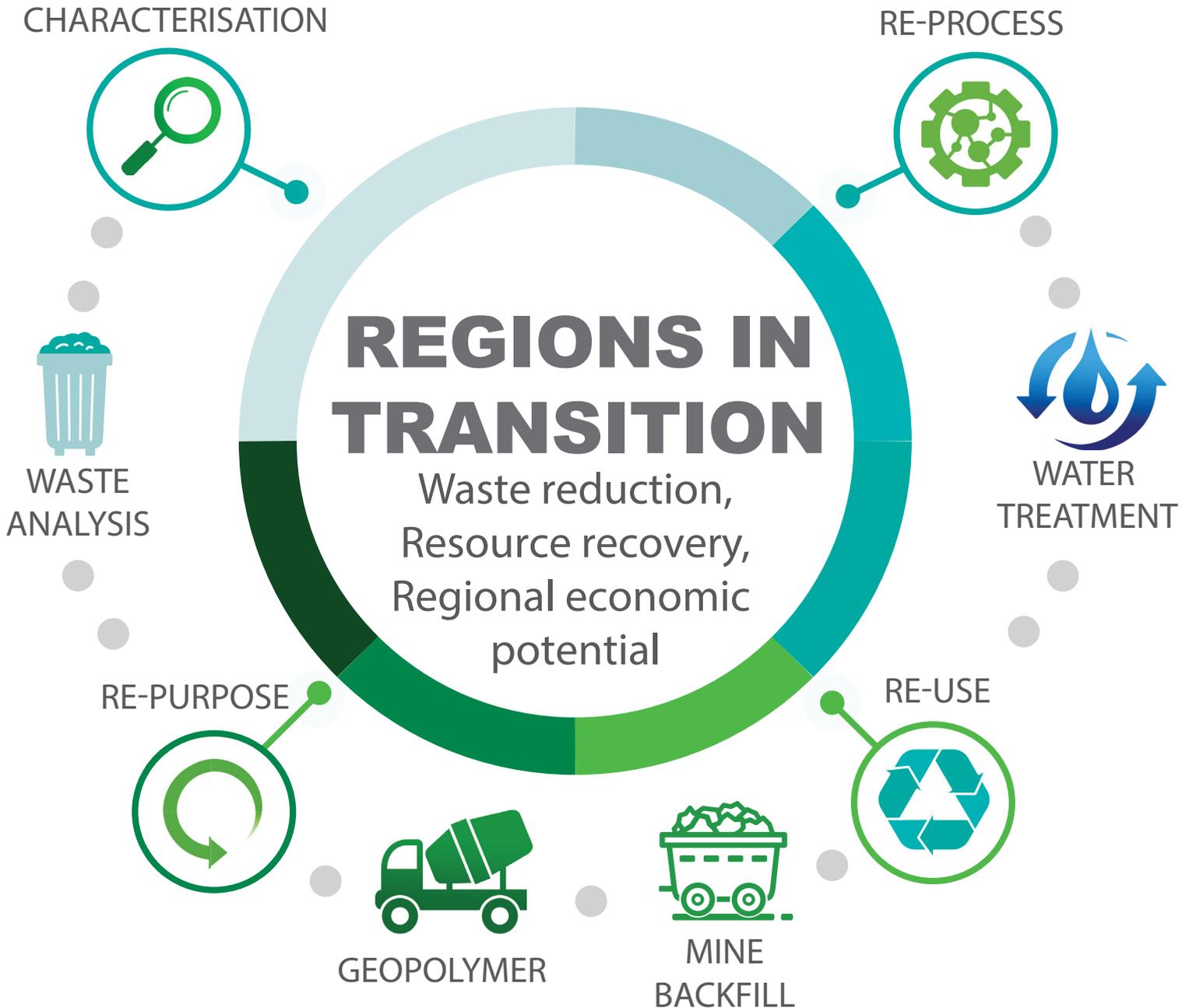


Intended Benefits

The intended benefits from this initiative are:

- Reduction in volumes of wastes at minesites – reducing liabilities for mining companies, local communities and State jurisdictions.
- Releasing tracts of land for earlier rehabilitation and post mining land use
- Creation of valuable products for use in ongoing industrial activity – both locally and globally
- Creation of new businesses and supply chains and post mining opportunities

Opportunities through a circular economy approach to mine wastes



For further details or to indicate your interest, please contact Prof Anna Littleboy

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