

Critical Raw Materials for the Energy Transition

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The global objective of tackling climate change through achieving net zero CO₂ emissions is driving decarbonisation of energy and transport, with a shift towards renewable energy sources and electric vehicles. It is now widely recognised that this will lead to significant increases in demand for a range of minerals and metals, including lithium, graphite, manganese, nickel and cobalt (used in batteries), the rare earth elements (used in magnets in motors) and the platinum group elements (for electrolysis to produce green hydrogen). There are concerns about the security of supply of some of these raw materials, and the increasing demand cannot be met solely by recycling; mining of primary resources will be essential.

Geologists and geochemists have a significant role to play in all aspects of securing supply of these raw materials. We need to understand the geological factors controlling mineral deposit formation, to better inform exploration; and the mineralogy and geochemistry of the ore bodies, to help improve efficiency of extraction and processing. Equally important is research on environmental impacts of mining these ore bodies, and innovative ways to make best use of waste. This talk will give an overview of the current situation with critical raw material supplies, and summarise recent research on all of these issues, with a focus on the rare earth elements and lithium.