

AUSTRALIAN LEVERAGE TO GLOBAL CARBON NEUTRALITY

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ABSTRACT

The global ESG compliance push is affecting almost all businesses, and supply-chain emissions are doing the front running. Emission reductions inherent in the renewable energy sector are the perceived as a climate-change saviour; however, that sector relies on the minerals industry, which not only supplies it with raw-material inputs but also leads the way in recycling end-of-life materials to maintain sustainability and minimise carbon footprints. Indeed, a vast range of critical minerals is required to maintain the very existence of renewable energy and the battery back-up necessary for storage and grid levelling. The battery industry, an insatiable consumer of minerals, is thus an integral part of the drive towards carbon neutrality and greening of the planet.

Australia occupies a unique position in the supply chain being developed for carbon neutrality, since it is a significant source of many of the resources required – among them nickel, cobalt, manganese, lithium and rare earths. That supply chain starts with exploration and mining to feed the downstream processing and manufacture of the materials being created to electrify the world, including domestic, industrial and transport applications. But that's not the end of the materials lifecycle; what happens to spent materials at the end of each product's life must also be considered.

Reducing carbon footprints involves more than examining ways of shipping of nickel, cobalt, lithium, iron and phosphorous to battery producers to fashion into storage devices, as indeed it takes more than the mining of rare earths to produce high-performance magnets, or the production of copper to expand power grids. Lifecycle optimisation must also extend into high-technology manufacturing areas.

As the source of a large proportion of the world's critical minerals, Australia has the greatest potential of any country to reduce carbon footprints by downstreaming its mineral products into things like refined metals, magnets, motors, wind turbines, battery chemicals, precursors, anode and cathode active materials, cells and batteries. But if such downstream production is necessary, Australia cannot simply rest on its laurels and keep producing the same minerals it did before (including nickel for the production of ternary cells). Should it not instead backward-integrate from a product with superior lifecycle attributes and mine accordingly to produce that product? As Australia strives to adopt the best available technologies to supply precursors, cathode powders and, ultimately, batteries for renewable energy storage, lithium ferro phosphate (or LFP) is a case in point. For OEMs, advanced materials like LFP can provide previously unrecognised advantages in relation to reducing carbon emissions.

Advanced metallurgical techniques currently being developed by Australian companies as part of 'urban mining' – that is, the rebirthing of the critical materials in end-of-life products – provide further environmental benefits.

One could say, then, that Australia has the ultimate leverage in terms of global decarbonisation.

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