Net zero unlocks the nation's critical minerals potential

The Australian

June 19, 2024 Wednesday

AustralianFeatureB Edition

Section: BUSINESS; Pg. 6

Length: 1080 words

Byline: SIAN POWELL

Body

With government support and an abundance of the mineral ***resources*** vital for many renewable energy technologies, Australia has the potential to become a critical minerals powerhouse as the world shifts to net zero. Yet experts warn there are headwinds that require careful navigation.

Certain critical minerals are essential for aspects of renewable energy generation, storage and transmission. Lithium, nickel, cobalt, manganese and graphite are all crucial for electric car batteries and solar and wind power storage systems. Rare earths are vital for the permanent magnets used in wind turbines and electric motors. Copper and aluminium are needed in electricity grids.

The transition to renewables is driving significantly increased demand for these minerals, an appetite which is expected to continue growing as the move to a green economy accelerates around the world. At the same time, nations are manoeuvring to ensure their critical mineral supply lines are as secure as possible at a time of geopolitical tension.

Governments around the world are taking action to establish resilient supply chains to provide supply security for onshore manufacturers, according to a spokesman for Australian company Lynas Rare Earths, the only scale producer of separated rare earths outside China.

The Covid pandemic demonstrated the risks of single-sourced supply chains, the spokesman added, noting: "Our new Kalgoorlie facility has been designed to accept third party feedstock which will provide opportunities as new projects come online." Lynas says the development of critical minerals processing in Australia will require different government support at different stages, and while the company welcomes the production tax credit, it recommends investment in common user infrastructure where Australia has a cost disadvantage.

"Much of today's infrastructure is expensive and not fit for purpose and this puts Australian critical minerals producers at a cost disadvantage," the Lynas spokesman says. "This is particularly apparent with utilities such as energy and water, landside logistics such as road freight, and labour costs. We see this as a once in a generation opportunity for government investment in 21st century infrastructure." Australia is already a world leader in the production of several critical minerals. In 2022, Australia was the top producer of lithium (52 per cent) and among

the top five producers of cobalt, manganese, rare earths and others, according to data published by the government's earth sciences agency, Geoscience Australia.

At the same time, there is ongoing federal support for new critical mineral discoveries and developments, and Geoscience Australia has been promised $566m over the next 10 years to fund mapping the nation's rich reserves of critical minerals.

The Australian government sees critical minerals as essential for economic sovereignty and the clean energy transition and the nation's Critical Minerals Strategy is intended to be a framework for the development of the industry.

"So much of our future prosperity depends on finding more critical minerals, extracting more critical minerals and doing more with critical minerals before we export them," Prime Minister Anthony Albanese told a Perth audience in May.

The government has provided the industry with substantial financial support, including a $7bn production tax credit and funding for infrastructure projects to boost exploration, processing and development.

The Critical Minerals Strategy includes a list of 26 critical minerals that "represent potential economic opportunities" - minerals such as lithium, magnesium, nickel, manganese, rare earths, titanium, zirconium, silicon and graphite.

Australia has rich critical mineral deposits, but to date the nation has limited processing capability, and the geographical concentration of some critical minerals and the long lead times for new mine development have raised concerns about supply chain security and potential price spikes.

The Australian critical minerals industry is often at the mercy of boom-and-bust investment cycles. Nickel lost value over recent months following a glut of cheaper products from Indonesia. This led to intense speculation the mining giant BHP would shutter its Nickel West operation, although the nickel price is beginning to rebound now with the troubles in New Caledonia.

Lithium, too, once described as the "white gold" of the renewables transition and an essential element in electric vehicles, fell in price. This followed a boom in value which led to oversupply and a consequent price slump.

International trade settings can affect the Australian critical minerals industry to a marked degree. China, for instance, dominates the rare earths industry, particularly the heavy rare earths industry, which is critical for many defence technologies.

In a statement in early June, Australian treasurer Jim Chalmers said he ordered five international companies linked to China to divest their shares in Australian heavy rare earths prospector Northern Minerals "to protect our national interest and ensure compliance with our foreign investment framework".

Northern Minerals, which operates the strategically-crucial Browns Range mine in Western Australia's Kimberley, wants to become the first major producer outside China of dysprosium, a rare earth used in electric vehicles and wind turbines.

The managing director of Australian mining company ***Iluka***, Tom O'Leary, voiced his concern about China's dominance of the rare earths industry at the company's annual general meeting in May.

Iluka has interests in titanium and zircon, as well as rare earths. O'Leary said China's dominance of the heavy rare earths industry was near total and "achieved through production supremacy and its influence over pricing", adding that last December China had banned the export of heavy rare earth processing technology.

"In addition to being essential for the production of electric vehicles and wind turbines, the key heavy rare earths, dysprosium and terbium, have critical applications in defence and national security," he said. O'Leary discussed the "megatrends shaping the global economy", including the transition to clean energy, the development of independent supply lines and the current policy settings of nations including Canada, Japan, South Korea, European Union

nations and Australia, which "are now aimed squarely at retaining onshore some of the economic opportunities of the energy transition".

Load-Date: June 18, 2024

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