

NEOMETALS' VANADIUM REVIVAL

While lithium-ion batteries are revolutionising the global automotive industry, vanadium redox batteries (VRB) are tipped to play as important a role in powering renewable energy systems.

As many forms of renewable energy are dependent on uncontrollable forces like the weather, using batteries to store power is a way to provide continuous flow 24 hours a day.

Originally developed at the University of New South Wales in 1985, VRBs are increasingly becoming the preferred battery storage solution for industrial purposes.

As you might have guessed, vanadium is the key ingredient in VRB batteries. It also remains a sought-after material in the production of high-grade strengthened steel.

The average price of vanadium pentoxide in 2018 was US\$18 (\$25.43) per pound – the second highest on record. Prices reached the record high of US\$33.88 (\$47.88) per pound in November.

Vanadium price tension has been caused by a structural deficit of supply and the requirement for new primary mine production to form part of the mix to fill the gap. This has prompted ASX-listed Neometals to revisit plans to develop its Barrambie vanadium-titanium project in Western Australia.

Barrambie's development was paused in 2009 and vanadium prices remained stagnant for more than six years following the global financial crisis.

The company is now set to release a revised mining reserve estimate together with an updated definitive feasibility study (DFS) which will examine the viability of primary vanadium production and staged exploitation of contained titanium and possibly iron.

To date, Neometals has spent about \$30 million on exploration and evaluation of the site, which it said was one of the world's highest-grade titanium-vanadium hard-rock assets.

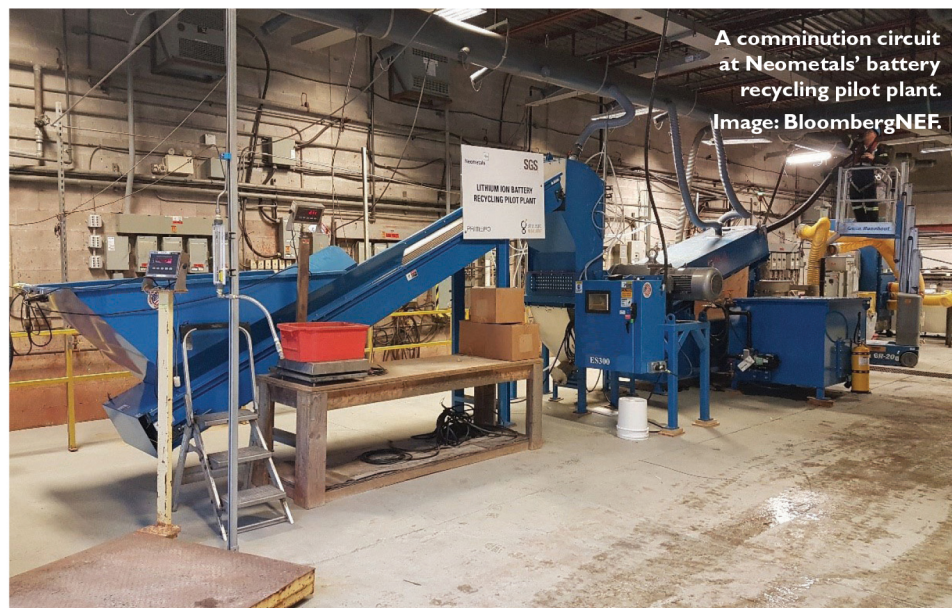
Most of the ground work on the approvals process has also been completed which, according to Neometals Managing Director Chris Reed, makes Barrambie the most advanced undeveloped greenfields vanadium project globally.

"We are in a strong position to go forward with this project," he said. "We have the right infrastructure and the right people on board who have experience in vanadium and building projects."

With the revised DFS expected for release in the June quarter, Mr Reed said Neometals would then be at the stage of off-take and finance.

"We would like to get onsite and start construction in 2020 for a two-year build," he said.

"This step-wise approach is consistent with the staged development and de-risking strategy we employed to successfully develop our lithium business.



A comminution circuit at Neometals' battery recycling pilot plant. Image: BloombergNEF.

"It might look like an overnight success, but it has been 15 years in the making."

With an estimated 280.1 million tonnes of ore lying under the earth at Barrambie, Neometals won't be constrained by resource.

"Once it is in operation there are a number of expansion options available to us," Mr Reed said. "The vanadium is the easiest product to get out, but that only contains a third of the value – we are working on monetising the titanium as well."

On the VRB front, Mr Reed said the commercialisation of these storage batteries represented a shift away from traditional energy towards de-centralised power and renewables.

"While these batteries are only five to six per cent of the market now, it is growing by 15 to 25 per cent a year depending on who you believe," he said.

"Compared to lithium it's nowhere near as explosive, so the danger with transport disappears.

"For mobility you want to use lithium, but for a large-scale format you need VRB."

RE-CAPTURING THE VALUE

Vanadium and titanium aren't the only commodities Neometals is looking to cash in on. The multi-faceted company has plans to build

a 10,000-tonnes-per-annum lithium-hydroxide plant just outside Kalgoorlie, but what is perhaps more interesting is its involvement in an emerging extraction industry which recycles used batteries.

Neometals has developed a process where it can recover approximately 90 per cent of all battery materials from lithium-ion batteries that would otherwise find their way to land fill.

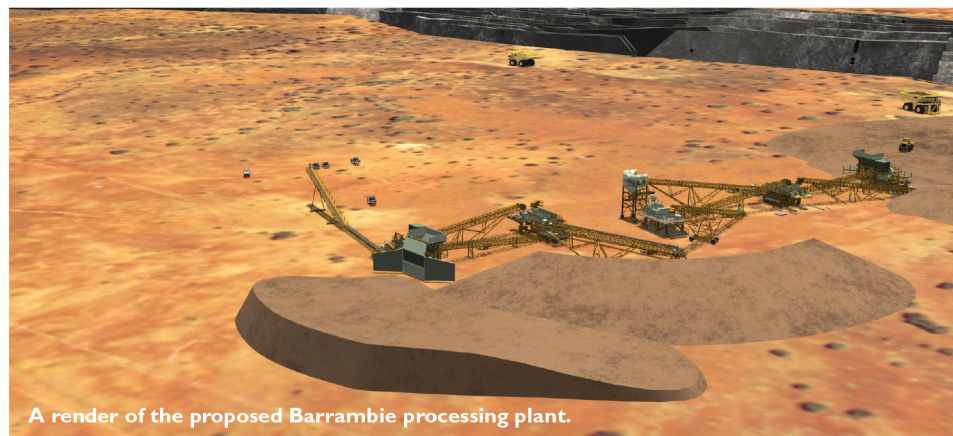
It is estimated only five per cent of lithium-ion batteries are recycled globally, but that may be about to change, with a number of European countries tightening regulations.

Where they are not already legally obligated to comply, car manufacturers are being pressured to bolster their environmental credentials by taking responsibility for disposal of used batteries.

Neometals will take advantage of this switch by targeting the recovery of valuable commodities such as cobalt, nickel, lithium and manganese through its recycling plant and selling high-purity materials back to manufacturers.

A shredding plant in Canada has been successfully commissioned and a pilot operation is underway to demonstrate the success of the project to customers.

"The pilot will serve as a showcase facility for potential partners as well as providing strong independent data for future engineering and financial studies," Mr Reed said.



A render of the proposed Barrambie processing plant.



Neometals

All the right elements

ASX:NMT

Neometals Ltd is a project developer and supplier of strategic materials, with a specific focus on targeting higher margins from downstream opportunities. The Company has three core projects:

- Barrambie Vanadium and Titanium Project
- Lithium-ion Battery Recycling
- Kalgoorlie Lithium Refinery Project

Neometals' strategy focuses on de-risking and developing long life projects with strong partners and integrating down the value chain to increase margins and return value to shareholders.

For more information, visit our website neometals.com.au

