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Vanadium arcs up on power potential

by DAN WILKIE

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BIG SELL: Australian Vanadium directors Vince Algar and Daniel Harris are leading the company's China marketing efforts. Photo: Australian Vanadium

China is charging ahead in the use of vanadium for renewable energy storage, potentially sending spot prices skyward and heaping pressure on global supplies of the material, which has historically had the industrial application as a key ingredient in strengthening steel.

Much of the hype around energy storage has been around lithium-ion batteries, which are used to power just about everything – from personal electronics to electric bicycles and vehicles.

But batteries need to be big and have a long shelf life.

The vanadium flow battery is emerging as a solution to the challenge that generation of renewable power, such as wind or solar, does not always occur at the same time as peak demand.

Vanadium redox flow batteries (VRFB) can also be used to store hundreds of megawatt hours of energy to provide an alternative source of power at peak load times on conventional energy grids.

Proponents say the batteries provide several advantages over their lithium-ion counterparts. VRFBs hold power for longer, can be scaled up more easily and can operate on a 24-

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hour, seven-days-per-week basis for up to 20 years – around twice that of a lithium battery.

And while the vanadium battery revolution is occurring worldwide, with more than 30 VRFB projects having been built or under construction since 2014 in 11 countries, China is building the biggest, as part of the country's commitment to reduce reliance on coal-fired power and transition to renewables.

In November, one of the biggest proponents of vanadium flow battery technology, Pu Neng, was awarded a contract to build one of China's largest VRFBs, with the project described as a glimpse into the future of the Chinese electricity grid.

Pu Neng will initially build a small-scale VRFB to demonstrate the capability of using the technology to integrate a solar photovoltaic system into the energy grid at Zaoyang.

That battery would be followed by a 100-megawatt, 500MW-hour energy storage project, underpinned by a VRFB, which is planned to be the cornerstone of a new smart energy grid in Hubei Province.

Pu Neng's project follows Rongke Power's 200MW-800MWh VRFB, which it is building in the Dalian high-tech zone and is the largest planned chemical battery in the world.

Rongke also has a large-scale manufacturing facility, which builds the batteries, with the project expected to come on line by 2020.

The Rongke power project is considered as a benchmark for VRFB technology, according to Australian Vanadium managing director Vince Algar.

"In China, there are massive amounts of renewables projects being deployed, they understand the concepts of true storage, long-duration storage and the dam concept of renewables, and that's not something that's gotten through in the Australian psyche yet," Mr Algar told *Australia China Business Review*.

"It's a very different thing than just trying to save the grid for a moment. People have got an idea of what the Tesla battery in South Australia is doing – it's just to stop a failure.

"The battery that Rongke is building at Dalian is like a benchmark for ultra-large-scale flow batteries and ultra-large-scale grid batteries in general.

"They provide longer duration storage opportunities for the grid, and they are long-life assets that are grid-life assets."

In Australia, there are 16 ASX-listed companies with JORC-compliant vanadium resources, including the world's two biggest miners in BHP Billiton and Rio Tinto, but there are currently no mines in production.

Other listed companies with significant vanadium resources include TNG Limited, Neometals, King River Copper and Surefire Resources.

The only previously operating vanadium mine in Australia was Atlantic Limited's Windimurra project in the Mid West,

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by DAN WILKIE

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which has been on care and maintenance since 2014.

Of those companies holding vanadium deposits, the closest to production is Australian Vanadium, which was established a decade ago and is rapidly advancing plans to start a mining operation near Meekatharra in the Mid West, known as Gabanintha.

Managing director Vince Algar said part of Australian Vanadium's development strategy would be to utilise the Windimurra processing facilities, which were purchased by Indonesian billionaire Anthony Salim in 2016.

Australian Vanadium director Daniel Harris was previously chief executive at Atlantic, a position that Mr Algar said gave the company an advantage in negotiations to utilise the Windimurra assets.

"It's critical infrastructure that's very hard to get your hands on," Mr Algar said.

"We are working with them as much as we can, because the quickest way to mine would be to use the infrastructure.

"If we can't close that, our opportunity is to build a processing plant, either at site or at Geraldton."

Mr Algar said the impetus for rapid development at Gabanintha was the fact that vanadium prices had surged throughout 2017, not only because of interest from the battery sector, but also on the back of a Chinese upgrade in rebar steel standards, requiring up to 30 per cent more vanadium.

In August, vanadium prices hit a nine-year high, with ferro vanadium, the product used in steel alloys, rising by around 90 per cent in the eight months to the end of August, while the price of vanadium pentoxide, the product used for batteries, more than doubled on European spot markets.

"Given the price has spiked so high, the interest levels from the vanadium flow battery companies is actually higher than the steel companies, because they need a lower-priced product, they need to be able to get the product at a lower price," Mr Algar said.

"Depending on how demand grows in the energy sector, if that demand becomes extreme because more Chinese companies are seeking to build these batteries, that is going to go up, and then they will really become desperate.

"Vanitec, the global organisation of vanadium producers, has a view that there could be 20 per cent increase in global demand over about a five-year time period, just from the battery sector, if you get a take-off in the technology.

"The market is pretty short right now, the supply side for vanadium is about 8,000 tonnes short right now, and that's being driven by demand in the steel industry."

Australian Vanadium, which is preparing a pre-feasibility study for Gabanintha, recently hired global minerals marketing firm Mastermines to identify customers in China, as well as seek out a potential investment partner.

In December, Mastermines principal David Gillam visited China on behalf of Australian Vanadium, meeting with a

host of steelmakers as well as several vanadium electrolyte suppliers that work with Rongke Power and Pu Neng.

Mr Algar said there was considerable interest in the potential of the Gabanintha mine, considered to be Australia's highest-grade vanadium deposit and ranked in the top three globally.

"We're seeking investment and we're seeking offtake and I'm very keen to spread that across steel and energy," Mr Algar said.

"We want to use this time to attract the right investor.

"There is an opportunity for us to use the high price to our advantage and attract an investor to the country. Then we can play the energy side and the steel side collectively.

"What that does is it gives us an insurance policy between the steel market and its ups and downs which are tied to macroeconomic events, and the energy market, which is not directly aligned.

"Energy is more consistent, if we have exposure to the energy market and the steel market it gives us the ability to spread and have some diversity in price points for different customers."