

Next mining boom in Australia will be driven by tech metals for renewable energy and technologies

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PHOTO: There are rare earth deposits across the world, but they are difficult to find in economic quantities. (Supplied: Northern Minerals)

The Australian mining industry is on the verge of a new mining boom based around so-called tech metals.

And as the race cranks up across the nation to find new deposits of rare earths and other metals, industry itself is calling for the development of a value-adding component.

Australia's two largest mineral commodities, iron ore and coal, are shipped offshore in bulk form where other countries, most notably China, value add by using them to manufacture many different products.

These include a lot of imported products Australia buys that are made from the very minerals it exported.

The tech metals complex is made up of rare earths and other minerals and metals that are used in what is referred to as the new economy.

They are essential to making high technology componentry such as mobile phones, solar cells and autonomous vehicles.

They are also used to make the different kinds of batteries needed to store power from renewable sources, and new types of lightweight engines to replace traditional combustion engines.

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PHOTO: The flow battery, also known as a redox battery, is made with vanadium, a tech metal found in Australia (Supplied: VanadiumAustralia)

Lessons from the last mining boom

Australian Vanadium has a high-grade vanadium deposit in central Western Australia, and chief executive Vincent Algar insists there is every opportunity to create new value adding businesses.

He said the way the last mining boom petered out quickly should be a salutary lesson.

"I don't think that anyone in the lithium space, or the vanadium space, or the cobalt space for that matter, should not do that given our experience in the last boom, where we shipped a lot of tonnes away overseas," Mr Algar said.

Vanadium is a metal that has traditionally been used as a strengthening agent for steel in the form of rebar, but Mr Algar said its real value in the technological age was as a key component in redox batteries, also known as flow batteries.

"We've got this new developing industry with growing demand, and I think we should be able to make the redox flow batteries in Australia because we do have a lot of technology," he said.

"And we also have a great skill set here in Australia, so let's take it right through to its logical conclusion, which is make the batteries here.

"We've already successfully produced our first batch of vanadium electrolyte, needed for the batteries, at the University of Western Australia."

The company has already entered into a venture with the world's largest flow battery producer, German company Gildermeister.

Rare earth hunters also want local value-adding industry

There are 17 rare earth elements on the periodic table, falling into the heavy rare earths or light rare earths depending on their atomic weight.

Up until recently, all rare earths were mined and exported from China, which has had a stranglehold on the industry and its pricing.

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PHOTO: Neodymium is one of three important rare earth magnets. (Wikimedia Commons: Nevit Dilman)

Given their global importance, the race is well and truly on to find more rare earth deposits, and Australia is a favoured hunting ground.

"They're actually quite ubiquitous in the Earth's crust," Arafura Resources managing director Gavin Lockyer said.

"Why they're associated with the term rare is the fact that it's rare to find them in an economically recoverable quantity."

Australia the perfect place for processing

Arafura Resources has done that with its Nolans Bore project 135 kilometres north-west of Alice Springs in the Northern Territory.

The find is considered significant, featuring a 56-million-tonne deposit with a 40-year mine life.

It is full of neodymium and praseodymium, which is used to make magnets, the bulk of which are now sourced from China.

"Instead of just digging it up and shipping it out, the plan is to do a lot of minerals processing in central Australia, which would produce a rare earth composite product that's high in purity," Mr Lockyer said.

"We really think there's much more value-add to be had by doing downstream processing, and Australia is the perfect place to do that.

"We've got an existing regulatory environment that covers things like water usage, environmental aspects, air pollutants, transport and disposal.

"There's already a well-established regime and bureaucracy in place to regulate that, and we think it's better to do that at the mine site where it all happens, rather than trying to do it offshore and making it somebody else's problem."

Politics and technology the key to new industries

Historical and contemporary drilling and grade results show that without a doubt, there is an abundance of rare earth metals in Australia.

But George Bauk, of Northern Minerals, said the problem with growing the industry, and value adding, was a lack of political will.



PHOTO: Dysprosium, a rare earth element used in magnets for electric vehicle motors, is resistant to demagnetisation at high temperatures. (Supplied: Northern Minerals)

"It's not only business. Governments should be asking how do we maximise the value for Australia," he said.

"How do we do what the Chinese did, set up an industry downstream to make sure we capture as much value as possible?"

The Northern Minerals rare earths project, Browns Range, is in the central northern Australia Tanami desert, and runs across WA and the NT.

It contains the rare earth dysprosium, another key ingredient in modern magnets that China has the monopoly on.

"If you look back to 2010, 2011, there were over 500 companies listed on the ASX with rare earths prospects. Today there are about eight of us left," Mr Bauk said.

Falling renewables cost



We always hear that renewable energy is getting cheaper, but what does that really mean?

"But we can compete with the Chinese if we look at the quality of the product that is here.

"Their grades are a 10th of what we have. Our grades are about 6,600 parts per million. Their grades are about six parts per million.

"We've got the product, now we need the collaboration and the political leadership and look beyond existing systems and look to the future."

Jobs growth through developing a supply chain

Mr Bauk said a rare earth mine itself could employ 100 people, but if a supply chain could be developed for in-demand products, it could employ 1 million people.

"It has to be cost competitive, but it can be," he said.



PHOTO: Vanadium, a key ingredient of redox flow batteries, is another metal found in Australia (ABC Rural: Babs McHugh)

"It's a journey that's not going to happen tomorrow, but we need leadership and direction to extract more value,

"And we need governments to look at the mining industry as being leaders in technology, not just guys in high visibility wear driving trucks.

"They're part of it, but there's so many opportunities in this sector. We've got some brilliant people in Australia, but we're not leveraging off it."

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