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BATTERY METALS

Finding value in the battery space

Graphite and vanadium companies could offer cheap options in London and Australia

Alex Hamer

It's tough to pick which battery metal or mineral will next deliver handsome returns. On top of that, even if you get the commodity right, the company you choose might be secretly in the midst of a boardroom fight or about to lose a major backer.

As ever, matching materials that have fallen out of favour but still have upcoming supply deficits, could see investors do well.

While easier said than done, this could possibly be achieved by heading to last year's heroes by backing Cobalt 27 (down 64% in 12 months) or going straight to Tesla after Elon Musk has tweeted.

Cobalt, though, is still looking for its price floor, so more pain may come.

Value investors did incredibly well betting on the sector in 2016-17, but last year was a different story as cobalt and lithium prices came off and TSX and London developers ran into funding crises, so applause to anyone who got out in time.

As the circus has moved from lithium and graphite to cobalt and then nickel and copper (which both have compelling and broad bull cases), investors have seen projects dusted off and company and mine names changed to catch the eye of markets.

Vanadium got its time in the sun last year, but that was thanks to China's tighter steel rules coming in rather than the vanadium redox flow batteries dominating company presentations. The V_2O_5 price rises also made life tougher for VRF battery makers, who were suddenly looking at electrolyte costing double what it had months earlier.

Fellow steel-dominated battery material graphite's time in the spotlight had already passed by last year, but that doesn't mean its fundamentals had changed, leaving some developers at very low valuations.

Benchmark Mineral Intelligence's Andy Leyland said in January the intense focus on the other electric vehicle-exposed commodities meant battery makers would have to come back to graphite after locking up supply of higher-stress materials.

Hands up if you like graphite: Walkabout says Tanzania's regulatory issues are improving and the graphite market is tightening

"There's been a lot of focus over the last couple of years on cathode technologies and that's led to the automotive makers and battery companies looking to start investing in and signing a lot of offtake contracts with cobalt, nickel and lithium producers," he said.

"Now, what I think we're going to see is a bit more focus on the anode and the graphite used here – people looking at the potential shortage going forward.

"Consumers want to lock in consistent supply, just like they do with lithium, and I think that graphite is going to get its turn in the sun over the course of the next 12-18 months with a lot of the battery companies looking to lock in offtake contracts, which until now have really focused on the lithium and cobalt markets."

In the short term, Leyland said the market would remain relatively balanced despite a supply influx.

"We expect another probably 90,000 tonnes of demand [this year] on a natural flake graphite equivalent basis, and on the supply side we are expecting about 95,000-100,000 tonnes extra," he said.

The extra supply is coming from Syrah Resources' Balama project in Mozambique.

If Syrah had thrown its graphite out into the spot market, it could have caused a major price fall, but its offtake agreements have so far kept everything stable, and Leyland said the miner was being smart about protecting price levels.

Gra-fight

Beyond more offtake deals in general, Chinese domestic production should also raise question marks for investors. If environmental restrictions on mines are lifted, supply could jump in a short space of time.

While the government has cracked down on highly-polluting operations, China has been importing graphite from Africa.

Hopeful market entrant Walkabout Resources' executive director Allan Mulligan told *Mining Journal* that China was getting antsy about graphite imports.

"They are really concerned the introduction of new product will create competition and will undercut or influence and disrupt their market," he said when asked about possible offtake deals.

"Offtake is pretty difficult right now because the bulk of offtakes lie in the Chinese domain, and the Chinese market doesn't really want to allow outsiders in unchecked."

Share price performance of graphite and vanadium companies

Company	Share price (March 5, 2019)	6 months ago	12 months ago	Year-on-year % change
Bushveld Min (AIM)	36.95p	22.75p	8.3p	345
Armadale Res (AIM)	1.21p	1.7p	2.08p	-42
TNG Resources (ASX)	A8.9c	A13c	A15c	-40.60
Syrah Resources (ASX)	A$1.27	A$2.34	A$3.31	-61.60
Volt Resources (ASX)	A2.2c	A2.1c	A4.3c	48.80
Walkabout Res (ASX)	A13c	A16c	A9c	44
Kibaran Res (ASX)	A10c	A16c	A16c	-37.5
NextSource (TSXV)	C12c	C9c	C14c	14

Walkabout is developing the Lindi Jumbo project in Tanzania.

Mulligan said the mine plan was based on generating a high margin so changes to Chinese domestic production rules and import issues would not wipe out profits.

"We have designed it with that sort of issue in mind," he said.

"The fact that it's been high-graded, the fact that it's looking to produce a premium product, not all allocated to batteries, and the fact that it's a modest size, of 40,000 tonnes a year or thereabouts, is all intended to mitigate against those sort of industrial mineral risks that we see coming around now and then.

"Second to that, in China, we're aware that although a lot of operations have been cut back or prevented from operating as a result of environmental or other issues, there are also operations that are getting deeper, more low-grade, and are becoming more expensive."

"I think that graphite is going to get its turn in the sun over the course of the next 12-18 months"

Lindi Jumbo's capex is about US$27.8 million, and will likely be raised through "mid-to-medium size" institutions and Australian shareholders, Mulligan.

That $27.8 million spend will generate a post-tax IRR of 119%, according to the updated.

A third iteration of the Lindi Jumbo "definitive" study came in March, after the company had to put in the new Tanzanian mining code requirements last year and upgraded the ore reserves.

More like guidelines, anyway

But there are still questions over the country's willingness to stick to its own rules, after refusing to hand back millions in VAT refunds to Shanta Gold and Acacia Mining.

As a developer, Walkabout will get a 10-year VAT deferment in construction, but will still be dealing with the issue after reaching production.

"[Because of the construction VAT exemption] VAT becomes an operational issue, and it does become a credit-debit situation between the government and yourself as a company," he said.

"Our discussions with locals is that they would very much like to resolve the situation and they are looking at how to do it, but it's a foreign exchange issue, and once their local content regulations and local banking situation is put in place in a more widespread way, we think that will become much less of an issue and they will contribute to refunding VAT when they can."

Tanzania working out its mining code is important for graphite supply, as there are several projects in the works, including Black Rock Mining's Mahenge, Kibaran Resources' Epanko, Volt Resources' Bunyu and Armadale Capital's Mahenge Liandu.

Mozambique helpfully has Syrah proving it can be a hospitable host country, and NextSource Materials and DNI Metals are across the water in Madagascar.

Volt hit a roadblock to locally financing its feasibility work in January when it said Tanzania's corporate regulator had set "unrealistic commercial terms" on a note issue.

Armadale technical director Matt Bull told *Mining Journal* Tanzania was improving after the shock of the new code in 2017.

"We are aware that there are some unknowns about how they're going to apply the mining laws," he said.

"[But] it seems the laws are going to be less onerous than initially put out, so it's becoming a bit more realistic than originally flagged, and more of the companies are starting to get through their permitting now, and there's quite a few companies now receiving their environmental permits, relocation action plan permitting and their mining licences, which wasn't happening until more recently."

Armadale is working on a feasibility study for Mahenge Liandu following last year's scoping study.

Bull said major differences were unlikely, but flagged lower than expected environmental and social costs.

Like many other AIM firms, Armadale has struggled with financing and pushed back the FS from the end of 2018.

Things are looking better for the company this year, however, and it signed a memorandum of understanding with Chinese mining and processing firm Matrass Group on a "proposed" offtake agreement for around 60% of Mahenge's forecast annual production (30,000t).

It also raised £795,275 (US$1 million) at 1.1p, and said it was bringing former Metal Tiger CEO Paul Johnson onto the board – "subject to due diligence" – to "enhance awareness of the company's value proposition".

The financing was done partly through company insiders, with Bull keeping his share in the company above 8% by converting a loan and money owed, totalling £86,000 into 7 million shares.

Once the new study is out, the company's likely three-strong board of directors will then make a call on moving forward.

Similar to Walkabout, Armadale will be looking for $35 million to get its mine up and running, with a projected IRR of 122%.

The new star

Vanadium is more front-of-mind for investors after it shot up in the second half of 2018 following the Chinese government changing its construction code to make buildings safer, sending V_2O_5 from a long-term price of $5 per pound to almost $30/lb.

In ferrovanadium terms, it tripled to $85 per kilogram in 2018 alone.

There has been a sharp fall since these highs, to under $20/lb V_2O_5, but vanadium still has plenty going for it, and recent moves between Chinese, European and US pricing show there are some trouble spots for supply.

SP Angel said as much this month: "On balance vanadium prices appear to feeling their way higher again with European prices heading higher probably on a lack of available supply out of China."

The investment implications for this are not overly obvious.

For those who missed the Bushveld train (hello 350% gain in 2018), firstly, no need to put your hands up – Bushveld shareholders usually introduce themselves with that fact,

Like Walkabout, Armadale says its strong grades will make it viable and then their name – and secondly, there won't be another one every year, unfortunately.

The AIM miner picked up a project cheaply (the $17 million purchase price plus the $600,000 fine from the London Stock Exchange for withholding material information in 2016).

For those looking for vanadium plays that haven't had the price ramp, there are a few choices.

London investors could soon be able to back ASX-listed TNG Ltd, which said this month it was looking at an AIM listing while it develops the Mount Peake vanadium, titanium and iron project.

While its stated goal of coming to the UK to find more liquidity is akin to visiting Las Vegas to get away from all the gambling in Salt Lake City, TNG is in a strong position for a developer.

It has offtake agreements for its vanadium and titanium products and the backing of the notoriously finicky German export bank KfW IPEX-Bank, which has signed on as debt adviser and arranger for up to $600 million.

This is the whole expected capital cost for Mount Peake, but the company is looking for a 70:30 split between debt and equity.

TNG managing director Paul Burton told *Mining Journal* that institutions in London and Europe were more comfortable backing vanadium.

"Whenever we've taken this project to present to … Hong Kong, London, New York, places like that, even places in Europe, we've always had a good reception," he said.

"They seem to get vanadium, get the chemicals industry, get what we're doing on the project.

"This is a big project for the ASX, they love the traditional commodities here, and it's very hard to get a lot of interest, particularly from institutions [and] fund managers."

Burton said there had been curiosity from potential backers in Australia, but no-one wanted to "be the first mover".

The openpit project is 230km north of Alice Springs in the Northern Territory, and will use an existing rail line to send ore up to a yet-to-be-built processing plant in Darwin.

German engineering firm SMS is currently doing a front-end engineering and design study for the project.

Burton said the project started off with a purely vanadium focus and then the other products came into play thanks to processing advances.

"We actually started out wanting to extract very high purity V_2O_5 from these types of resources, and by using a chemical method we were able to do that, that gave us very high recoveries and very high purity," he said.

Squeaky clean: Sumitomo's 15MW/60MWh vanadium flow system in Hokkaido

"But by default almost, we were able to then get quite a good quality recovery and grade for the TiO_2 and then the iron oxide was captured almost as a by-product at a later stage when we had this asset recycling process when the SMS group got involved."

The mining itself is pretty simple, with an openpittable resource of 160 million tonnes at 0.28% V_2O_5, 5.3% TiO_2 and 23% iron.

"This is a big project for the ASX, they love the traditional commodities here, and it's very hard to get a lot of interest"

The two-stage mine plan sees 900,000t of concentrate produced from years one to four from a 3Mtpa run rate, and then 1.8Mtpa concentrate from a 6Mtpa run rate after year four.

Burton said the vanadium and titanium would each provide about 45% of revenue, and annual net cash flow (averaged over 17 years) is forecast at just over $500 million at current A$/US$ exchange rates.

Steel my thunder

The driver for much of the general investor interest in vanadium has long been the promise of its application as an electrolyte in large-scale battery systems.

This is a case of style-before-substance, because the batteries take up less than 5% of global vanadium supply, and last year's price hikes came because China asked for more of the metal to go in its steel.

Burton said he was bullish both on steel and battery demand drivers.

"[The steel] market is a very strong one and a very good one, and it grows about 6% every year, year-on-year, despite the amount of steel that's produced, because there's a lot more vanadium just going into steel production," he said.

"[That] will remain its primary role, however, once the tide does turn on vanadium redox batteries – and it will – it's really going to grow rapidly.

"Once that happens … there isn't enough vanadium around to accommodate the building of 100 or 200-plus big batteries."

The current state of VRF technology is easily demonstrated by TNG's mine plan, which includes a battery system.

"We know we can do the solar array, and we can get the battery down from Japan," Burton said.

"It will run, probably, the accommodation section, the water pump, all that sort of stuff. Non-critical, just to get it going."

Burton said the application for mines was clear, but those putting the plans together were "risk averse" and would only use "tried and tested methods".

This is likely pleasing for shareholders who want to avoid experimentation with their cash, but shows why progress can take so long in mining.

Anyone involved in mining investment for more than 10 minutes will know picking a value stock is one of the trickiest things you can do. But, with market attention on gold and base metals, this could be the time to grab a bargain.