Lithium and boron co-product projects in the making

THE rise and rise of the hard-rock and brine lithium producers was a standout feature of the local mining market in 2017, writes Barry FitzGerald.

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But the massive increases in market valuations they secured during the year in response to the lead role of lithium-ion batteries in the world's energy storage revolution was not theirs alone.

The year also saw the rise of the co-product rivals, namely the lithium-boron projects.

There are only two of them – Rio Tinto's Jadar project in Serbia and Global Geoscience's (GSC) Rhyolite Ridge project in Nevada in the US.

Jadar was elevated during the year by Rio to potential producer status by 2023 which is saying something because it has sat on the books since 2004, most of the time as a boron option.

The electric vehicle boom with its attendant need for more lithium, plus Serbia's questioning of when the thing will be developed, has prompted Rio to get cracking on development studies. Still, it is questionable whether the rise of Jadar as a development option moved the needle in Rio's overall valuation during the year.

It has been a different story for GSC. Apart from some residual gold/copper exploration properties, Rhyolite Ridge is GSC's sole focus.

So it can be said that that its share price surge from A7c at the start of the year to 30c this week, carrying its value to about $400 million, is a direct response to growing investor interest in the potential of the lithium-boron projects to become robust lithium projects in their own right, with boron revenues boosting project returns.

Rio has said nothing about Jadar's likely economics. GSC has been more forthcoming in an indicative sense, given a preliminary feasibility study is not due to be released until mid-2018.

But its indicative work gives a feel for why the combination of lithium and boron poses a serious challenge to the status quo of global lithium production.

Target cash costs for lithium carbonate at Rhyolite Ridge have been put at US$3500-$4500 a tonne. That's more than the long-run expectations of the brine producers but much less than the hard-rock producers, on a lithium equivalent basis.

Assume a long price of $8000 a tonne for lithium carbonate (spot prices are around $12,000 a tonne), and a decent margin is on offer. But then comes the production of boric acid with targeted cash costs of $400-$500 and a long-term sales price of $800 a tonne.

Because of the one-to-eight ratio of lithium to borate mineralisation, the revenue stream from boric acid becomes $6400 a tonne, making the indicative revenue per tonne of lithium carbonate produced to more than $14,000 a tonne.

That has been what has been driving interest in the lithium-boron projects, with GSC's meteoric valuation rise in particular underpinned by confirming work that the mineralisation at Rhyolite Ridge is amenable to low-cost acid leaching at ambient temperature and pressure.

And more recently, there was the breakthrough work indicating that the acid leaching could be done in a heap leach operation, pointing to substantially lower operating and capital costs – all of which first needs to be confirmed in the PFS and following definitive feasibility study.

All that explains why when the books are ruled off for 2017, GSC will have been one of the top performers in the mining space. And if Jadar wasn't locked up inside Rio, it could be assumed there would have been similar value uplift for the project.

Having said that, the boron component of both projects does pitch the GSC the minnow, against the Rio the giant.

Rio has long produced boron from its truly world class mine in California, appropriately named Boron. It supplies nearly half of world demand for borates as part of a duopoly with Turkey's Eti Maden.

Boron is getting long in the tooth and it is assumed that part of Rio's development considerations at Jadar will include an assessment on whether new capital is best spent there, or on extending the life of Boron, where strip ratios continue to rise as Rio chases thinner, deeper, and changing mineralisation styles.

Boron pretty much supplies all of the US market and by developing Rhyolite Ridge, GSC will looking to take some of that market for itself. Like any market where one supplier dominates, there will be end-user support for a new US supplier working in GSC's favour.

Its ambition in that regard seems doable, say 100,000 tonnes-a-year of boric acid out of a US market – the world's second biggest behind China – of about 600,000 tonnes.

It will nevertheless be a challenge for GSC to take on Rio in its own backyard (Rio drilled Rhyolite Ridge in the past but let it go because at the time it only wanted water-soluble mineralisation like that at the truly unique Boron).

On that score though, it is worth noting that former Rio executive Alan Davies joined the GSC board earlier this year.

It was his first local directorship since he was controversially dumped by Rio over his alleged involvement in Rio's Simandou iron ore payments scandal in Guinea.

He has strongly denied any wrong doing and said at the time of his sacking that he had been left with no option but to take the strongest possible legal action in response.

"Rio Tinto has made no effort to abide by due process or to -respect my rights as an employee and it has given me no opportunity to answer any allegations,'' Davies said at the time.

More to the point is that his previous role at Rio included looking after Jadar and the Boron operation. It was a nice move by GSC to get him on board. His insights will be invaluable as the company plots its entry in to the twin markets of lithium and boron.

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