

BATTERY METALS

Mood Swings & Finance

S & P Platts

Battery Metals Conference – San Francisco 2019

Christopher Ecclestone – Mining Strategist

HALLGARTEN & COMPANY

CHALLENGES OF RAISING CAPITAL IN THE CURRENT ENVIRONMENT

- Battery Metal “booms” and their legacy
- The demise of bigness – small is beautiful
- A look at the individual metals and investors attitudes to the developers and miners in each category
- Challenges of capital raising
- Some futurology

MOOD SWINGS OR SEE-SAWS

- The battery metals space has been afflicted with mood swings induced by a lack of clarity about future demand
- While promoters can produce great charts on future EV production the disconnect is that few Western companies have shown their hands (until very recently) on battery or EV production
- Most importantly the US's OEMs have not shown much enthusiasm, in practice, for the EV "revolution"
- Lithium production comes in surges. The current abundant supply has detracted from funding of future production with the potential for future undersupply
- China's EV boom may not be all its cracked up to be

BOOMS, BOOMLETS AND BUSTS

Battery metals have evolved through a series of separate, and then combined, “booms”. Cobalt’s previous strong period before the 2008 crash was driven by factors that were not battery related.

So the first manifestation of battery metal interest was the Lithium boom in 2009-10. It was shoved aside, into obscurity, by the much sexier Rare Earth Boom.

Then there was a Graphite boomlet in 2013, from which most of the present players originated. There had been graphite players before then but the real expansion came during a “dead time” for the rest of the mining space.

Then in 2017 a more generalised focus on battery metals erupted and a swarm of new players appeared. However, financing dried up when the prices of Lithium’ and Cobalt headed south.

Values faded and the battery metals joined the rest of the mining sector in the “dog house”.

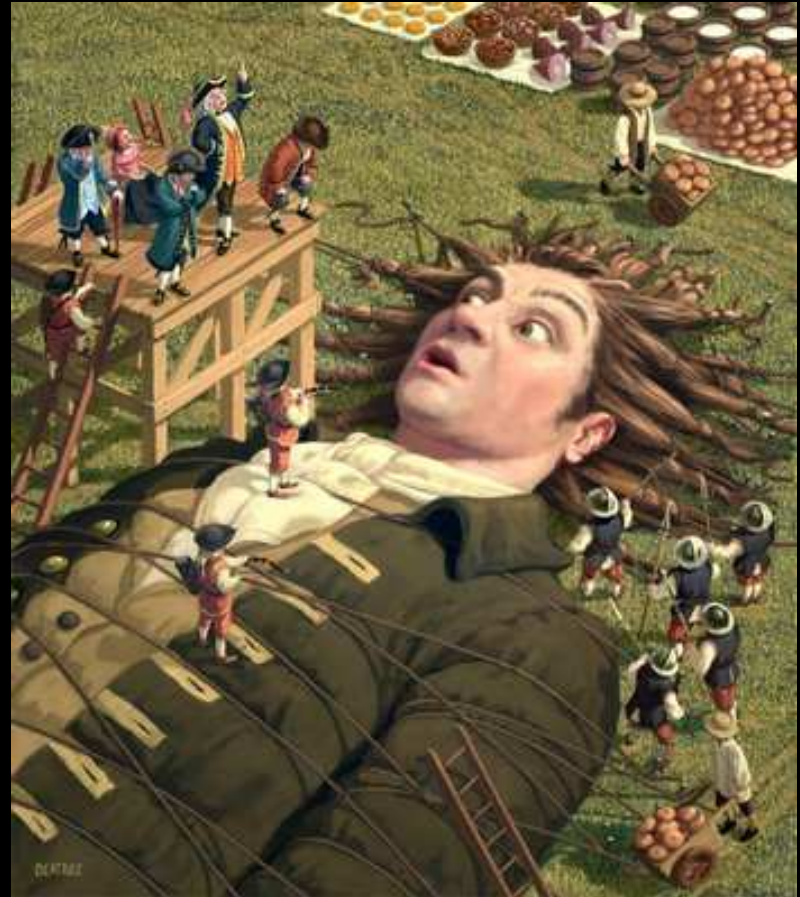
THE END OF GARGANTUANISM

The mining industry has been inflicted by gargantuanism over the last 20 years and in most cases it has ended in tears. Oversized projects with over sized capex become like unsteerable supertankers. They cannot respond to price signals nor to demand fluctuations.

This has been particularly notable in the Nickel space, in Rare Earths and in Graphite in one notorious case.

They frequently come to grief due to their inflexibility created by their oversized nature.

The era of project bloat is over.....



COBALT – GARBAGE IN, GARBAGE OUT

- This metal has been damaged by conceptions and misconceptions
- The promote of this commodity was particularly brutal and fallacious
- A lot of third rank projects were touted by promoters who had little intention of exploring their acreage let alone mining it and producing any metal of relevance
- This fakery went all the way to the top
- Little or no product has emanated from the Cobalt “boom” of 2017
- Whatever market discipline exists is applied by Glencore for its own benefit
- 90% of current Cobalt plays are not fit for purpose and need putting out of their misery
- Investors have cottoned on to this and are on a capital strike

NICKEL – ANOTHER DAY IN THE SUN?

- This metal is obviously the star of the Battery Metal universe in 2019 but we might question whether it is being driven by EV considerations.
- Even the most bullish forecasts, for a decade out, are talking of 15% of global production of nickel going to battery usages so other factors will drive the Nickel price, short- and long- term, though EV's will be the most important incremental demand.
- Joined at the hip with Cobalt
- Project nature with enormous capex and problematic history of laterite deposits runs up a red flag for investors and mining companies alike
- Mega-laterite projects are unfinanceable at the current time and may remain so until Ni prices are at a multiple of current levels

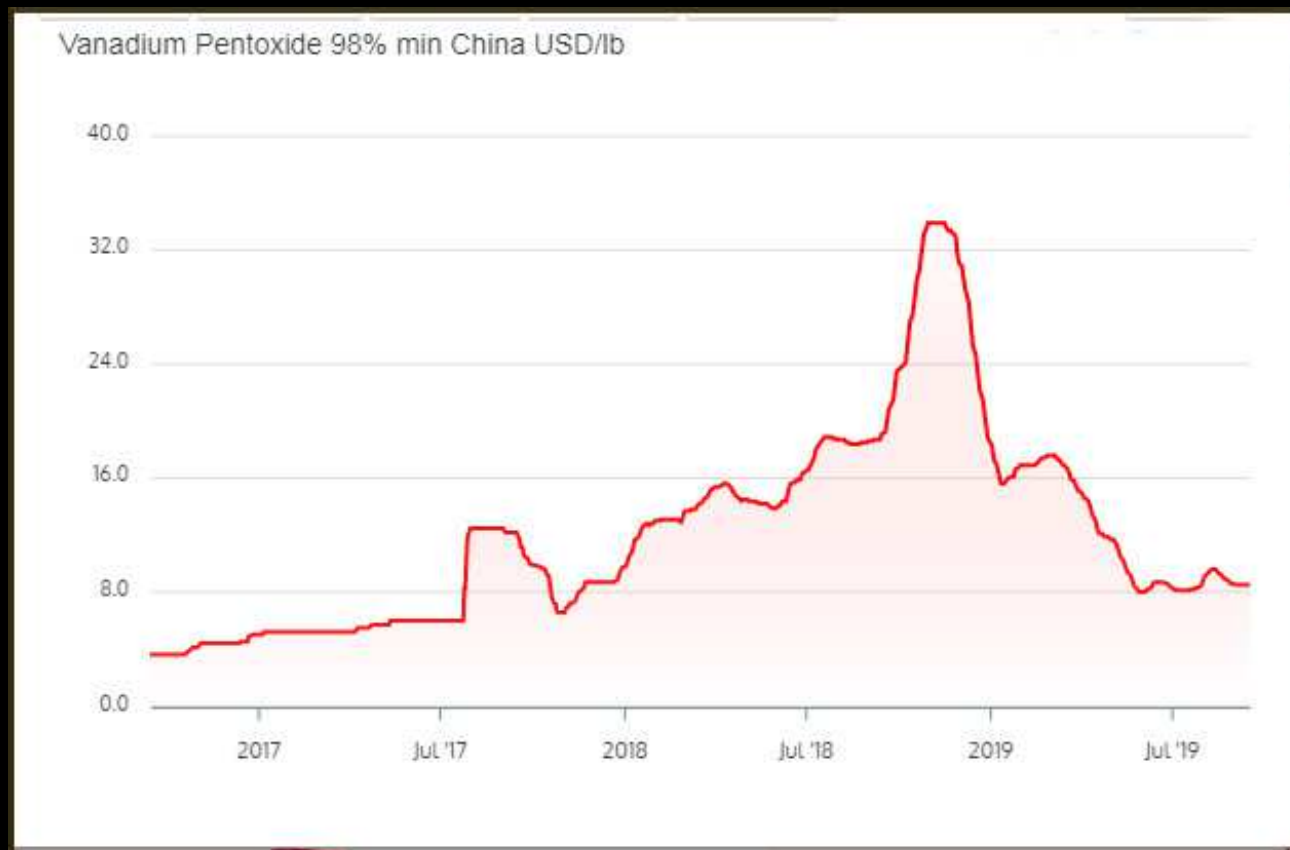
LITHIUM – LET THE CULL BEGIN

- Hope spring eternal for promoters in this space.
- There has been little attrition in the number of Lithium wannabes despite the excessive number of players and the flaccid price and financing outlook
- Brine enthusiasm was superseded by a spodumene phase and now the mood is swinging back to brine. Other mineralisations (petalite, clays and mica) are “surplus to requirements”
- Financing is tough, in Canada in particular, due to “distractions” (i.e. weedmania)
- Many juniors did not raise enough money to carry on exploration through the current lean patch, meaning there are few exploration results, resource estimates or more advanced mine planning hitting the wires

LITHIUM – REALITY BITES

- Producers are producing, much fewer than forecast, and certainly not enough to create the oversupply apocalypse that uninformed Bulge Bracket analysts have posited
- Some end-users, particularly out of Asia (notably Koreans) are positioning to make themselves independent of Chinese supplies by investing or “encouraging” LatAm and Australian projects
- The US and Canadian projects are way back in the race
- Argentine projects should be benefitting from a mood swing back towards brines but domestic politics have intervened
- Improving prices should revive financing efforts but only for a select few projects that are either anointed by end-users or have super-serious managements

VANADIUM – WHAT GOES UP, MUST COME DOWN?



VANADIUM – FULFILLMENT DELAYED

- The wild ride in vanadium has delayed gratification for most investors/believers in the metal
- We are amongst the believers with VRBs being the most exciting thing in mass storage
- However, our talks with VRB makers signal that they “need” Vanadium Pentoxide at \$10 per lb, or less, to be commercial
- The eternal wait for China to eventually enforce content rules for Vanadium alloys in construction steels goes on
- China is playing with the market to ensure it does not get ripped off
- The last “boomlet” produced quite a number of serious plays but almost all were Ti-V-Fe in nature
- “Soup-to-nuts” = mine to VRB might be the Holy Grail of V

GRAPHITE – AWAITING THE GRIM REAPER

- Fate of Syrah will dictate future shape of this sub-space
- If it falls then several projects with more bitesized production and capex could come out from the shade
- If Syrah goes under, then three or four more projects over the next two years would get traction to production

- How much extra capacity does this bring to the market?
- This depends whether it is sane economic judgements driving the decision making process or just forward momentum

- Financing of projects is more likely from end-users or intermediaries than equity markets

THE GRAPHITE FIELD

	Ticker	CapEx	Grade Cg Resource	Cost per Tonne	Location	Status
Battery Minerals	ASX:BAT	US\$39.5mn	8.1%	US\$361	Mozambique	Feasibility Feb 2017
BlackEarth Minerals	ASX:BEM		7.1%		Madagascar	Resource
Ceylon Graphite	TSX-v:CYL	-			Sri Lanka	Bootstrapping
Elcora Resources	TSX: ERA	-	n/a	n/a	Sri Lanka	Mothballed
Focus Graphite	TSX.v: FMS	US\$141mn	15.0%	US\$468	Canada	Feasibility 2014
Graphex Mining	ASX:GPX	US\$43.6mn	10.5%	US\$500	Tanzania	PFS Sept 2018
Kibaran Resources	ASX: KNL	US\$77.5mn	8.3%	US\$500	Tanzania	Feasibility 2015
Leading Edge Materials	TSX.v: LEM	US\$16.7mn	9.3%	US\$730	Sweden	Mothballed
Magnis Energy	ASX:MNS	US\$269mn	5.4%	US\$502	Tanzania	BFS 2016
Mason Graphite	TSX.v: LLG	CAD\$258mn	28.0%	US\$484	Canada	Feasibility 2018
Nextsource Materials	TSX: NEXT	CAD\$18.4mn	6.1%	US\$353	Madagascar	Feasibility 2015
Northern Graphite Corp	TSX-v: NGC	US\$85.5mn	2.2%	US\$766	Canada	Feasibility 2012, PEA 2018
Nouveau Monde Mining	TSX-v: NOU	US\$230mn	4.0%	US\$532	Canada	PEA 2016
SRG Graphite	TSX-v:SRG	US\$105.1mn	5.6%	US\$502	Guinea	PEA 2018
Syrah Resources Ltd	ASX: SYR	US\$300mn	11.0%	US\$475	Mozambique	Producing at 50%
Triton Minerals	ASX:TON	US\$99.4mn	6.2%	US\$634	Mozambique	DFS Dec 2017
Volt Resources	ASX:VRC	US\$31.8mn	5.4%	US\$664	Tanzania	Feasibility July 2018
Walkabout Resources	ASX:WKT	US\$27.8mn	10.8%	US\$347	Tanzania	DFS March 2019
Zen Graphene	TSX-v: ZEN	US\$411mn	3.9%	US\$2,046	Canada	PEA 2015

OTHER BATTERY METALS

Fluorspar: The key element in the EV story is hexafluorophosphate the

- Very strong price moves, a strong demand, geopolitical events and yet the equity market for this mineral is denuded of offerings
- Mexchem is the most obvious point of exposure, Canada had a listed play earlier in the decade and the AIM-listed player was blocked from developing its Swedish mine so drifted away.
- Potential for some new entrants

Manganese: Is Electrolytic Mn all that elusive?

- Undoubtedly a key component in many LiB mixes
- There are a number of plays in this space
- Investors not necessarily persuaded this usually DSO mineral is all that special

FINANCING IN A “TIME OF CHOLERA”

Equity financings – at best a dripfeed

Canadian markets are doubly afflicted by faddism – In recent years mining financings have been overshadowed by first, Blockchain and, now, Weedmania

Fate of battery metals is tied to EV growth expectations in general, even in cases where EVs are not currently the main user or never will be...

Offtakers have now become key financing sources, however their number is limited

Private Equity & Hedge Funds are now players – the latter can be predatory – naïve managements have fallen prey to them in other parts of the mining space with debt financings being particularly dangerous

FUTUROLOGY

- There will be increasing focus on, and establishment of, non-Chinese battery metal supply chains with South Koreans, Japanese and German companies leading the way
- US will be “well behind the eight ball” and dependent upon these other three countries rather than China
- China will not be a threat to supply - it will have reduced market share
- There will be a growing realisation that some battery metal mining is not particularly profitable
- Prices for some key components like Lithium and Cobalt should start to rise in 2020
- A new floodtide will **ONLY** selectively lift some of the boats in these metals