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HALLGARTEN + COMPANY

Portfolio Strategy

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Model Resources Portfolio:

China Goes Ex-Growth

Performance Review – June 2023

Model Resources Portfolio

China Goes Ex-Growth

- + **Silver holding up much better these days than gold**
- + **Tin prices flirted again during the month with the $27k per tonne mark**
- + **Glencore has become the most significant disruptor in the mining M&A space with various actions, successful and (as yet) unsuccessful**
- + **Lithium carbonate price in Yuan has doubled since May lows and no stabilised**
- + **Zinc managed to bounce off the perilous $1 per lb mark and head higher, while copper draws near to $4 per lb mark again**
- ✘ **The creeping realization is spreading that China's growth is off, and may never be again what it was**
- ✘ **LME Nickel debacle trial began in London with management and regulators looking to have been "out of it" when their leadership was most needed**
- ✘ **Teck has returned to "deer in the headlights" mode**
- ✘ **Finally, higher interest costs are impacting negatively the property and construction sectors in a wide range of countries**

The Chinese Punchbowl Runs Dry

The current moment has an eerie quality, in some ways redolent of the late 1930s. The enemy has been identified and it is China, states are in a race to reshore, de-onshore, or variations thereof, to move their productive capacity not only out of China, but to states that are in no way linked to China. Picking sides has been the name of the game. While Russia's invasion of the Ukraine seems like the main game to others it might be seen as being like Italy's invasion of Abyssinia, a sideshow to the main event.

Team China though is looking a bit thin on the ground. When pundits refer to China's friends its generally not a group that look ideologically like China or even admire China but rather states that as so hard up for funding projects that they will tug for forelock to anyone… and just as easily default to them when the Chinese come in a foreclosing mood.

Now fears are being raised that Chinese growth expectations aren't what they are cracked up to be… a belated welcome to the club of those that always found the 6-7% "band" of Chinese growth to be a form of collective delusion. Now the international press is singling out companies for being "over-exposed" or "overly dependent" upon Xi's dream state. With one-time willing captives like Apple even distancing themselves is it any wonder that investors are starting to see vulnerabilities in the Chinese model? The Japanese have shown themselves to have finally learnt the adage "Once bitten, twice shy" with MITI actually funding Japanese magnet makers to redirect their manufacturing efforts elsewhere.

We have reduced to laughter several times in recent months by references to BRICS mumblings about creating an alternative to the US dollar. Offer the citizens of any of these a bundle of US dollars or the equivalent in Yuan and you will see how fast they "go for green". The total naivety of the declaimers of the BRICS Triumphant Theory have yet to explain how a cohesive challenge to Western ascendance can be made from a kitschy acronym encompassing a Russia humbled, South Africa a basket case (the "s" used to be just a plural rather than a state at the end of Africa), India and China at each other's throats and the Chinese being largely *persona non grata* in the Brazilian economic space.

And yet fellow travellers still have the ears of some Western governments, even if they cannot sway defense and intelligence services. It might be noted that IBM and General Motors were still providing the Nazi regime with products after it had started its romp across Western Europe. Just a few weeks ago the head of Raytheon made the comment to the FT that "We can de-risk but not decouple" when referring to China. By the very nature of the product range of Raytheon, one would hope that they are not still supplying China up until the moment the bullets start flying.

Over the beyond the mass desertion of those seeking distance from the Middle Kingdom there is the evolutionary stage where China has ceased to be cheap. The days of $1 polo shirts made by prisoners for foreign consumption are now behind us. China thus has only productivity going for it in the race for cheap & cheerful with the likes of Bangladesh. This is part and parcel of any economic evolution but then souped up by the one-child policy of yesteryear finally starting to bite on demographics.

The flaccid performance and demand of China of late looks like the country has gone ex-growth. Probably a good thing for saving the planet but something miners need to take into account going forward.

Portfolio Moves

We added no new positions during the month. We dispensed with our **LONG** positions in C3 Metals, the copper explorer, and Desert Mountain Energy, the Helium promoter.

Lithium International (ASX: LPI) – Bagging a Gain

Lithium Power International has been a **LONG** in the Model Resources Portfolio since 2017 when we made the trek to the Salar de Maricunga to visit the project. Less known were its two other exposures: one in Argentina (which was sold years ago) and the other in Western Australia. In recent days the company completed the sale of this Australian subsidiary, Western Lithium Ltd (WLI), to Albemarle Lithium Pty Ltd, an Australian subsidiary of Albemarle Corporation.

The transaction involved the sale of 100% of WLI's shares for AUD$30mn, with AUD$29mn already received and the remaining balance contingent on certain tenement applications being granted within 18 months of completion.

With a market cap of around $200mn these days, the realisation of value from this "below the radar" asset is a welcome boost to the cash reserves in the run-up to development. We reiterate our LONG rating on LPI and our 12-month target price of 80 cts.

Pot of Rare Earths at the End of the Rainbow?

With Rare Earths all the rage, one would have thought that Rainbow Rare Earths would have been able to raise more excitement for its reactivation of Rare Earth production in South Africa, but it is seemingly not the case. In recent weeks there has been a major advance in the project and yet the market just yawned.

Phalaborwa – the Back Story

In early November of 2020, Rainbow when it announced its plans to exploit vast tailings and waste product piles at an old South African phosphate mine for their REE content, which it henceforth termed the Phalaborwa Project.

The deal was that Rainbow and the vendor Bosveld Phosphates (Pty) Ltd agreed that on completion of a pre-feasibility study (PFS), 70% of the project would held by Rainbow and 30% by Bosveld, with a mechanism included to allow for Rainbow's Joint Venture ownership to vary from 60% to 85%, dependent on results of the PFS.

The project is fully permitted, with an Environmental Impact Assessment completed.

Bosveld, a South African company, had acquired the Sasol Phosphoric Acid Plant in the Limpopo Province of South Africa back in 2012, following a competition ruling on Sasol's monopoly in the market. A hard rock foskorite and pyroxenite deposit was mined over a period of around 50 years by Foskor.

The mined ore was concentrated in a flotation process and subsequently processed by Sasol, resulting in a total of around 35 million tonnes of gypsum being deposited in two stacks.

The Rare Earth Plant

The pilot plant (shown on the following page) was developed by Sasol and successfully produced three tonnes of mixed Rare Earth carbonate (achieving 80% recoveries) and an associated Cerium-depleted oxide from the gypsum. This pilot plant remains on site and is being recommissioned. In various stages, it upgraded these concentrations to potentially economic levels of REEs, through:

- initial concentration by flotation at the Foskor plant
- further concentration during the sulphuric acid leaching process (cracking) at Sasol's PhosAcid plant to produce phosphoric acid, at which stage, the REEs were solubilized
- gypsum was formed during the phosphoric acid production, which was discharged to the stacks with the REEs.

Below can be seen the REE separation plant (in an excellent state of preservation) at the Phalaborwa site.

Resource

Phosphate rock, the raw material of phosphoric acid production, is known as a secondary source of low-grade REE. Low in-situ concentrations of REEs were contained within the original Foskor orebody. Initial grab sample assays from the c. 35 million tonnes Gypsum Stacks indicate 0.6% TREO, indicating c. 210,000 tonnes of contained TREOs, with Neodymium (Nd) and Praseodymium (Pr) (together "NdPr") anticipated to constitute c. 30% of the TREO basket.

These gypsum stacks are enriched in REEs from the historic concentration of these elements during Foskor's flotation process, followed by further upgrading in Sasol's PhosAcid Plant, leading to REE concentration in chemical (rather than mineral) form, which enables simpler onward processing.

Sasol developed a comprehensive process flowsheet to extract the Rare Earths from the gypsum, which resulted in a successful pilot plant operation, producing around three tonnes of mixed Rare Earth carbonate at around 80% recoveries. The output of this plant was being sold to the Japanese end-users of REEs.

Initial reports suggest low levels of radioactive elements, similar to those seen at Rainbow's Gakara Project, in Burundi.

An additional environmental benefit is that the re-processing of these Gypsum Stacks will redeposit clean, benign gypsum, which has the potential for further use in the building and fertiliser industries.

Latest Developments

In recent weeks the company announced that things had materially advanced at the South African operations, namely that:

- the pilot plant front-end had commenced operations and was on track to produce the first high-value mixed Rare Earth sulphate in 3Q23
- the front-end process in line with Rainbow's project development timetable and budget
- the pilot plant back-end, to produce separated magnet-grade Rare Earth oxides, was well advanced in terms of its construction, with commissioning due 3Q23

These pilot runs are expected to confirm Phalaborwa's status as a near-term producer of magnet rare earths, capable of being commercialised on a standalone basis, materially de-risking the project.

The pilot plant is split into two phases. Phase one comprises a front end where material from the historic gypsum stacks at the Phalaborwa site will be consolidated into a Rare Earth sulphate, containing economic quantities of the four most important REEs, namely Neodymium and Praseodymium, Dysprosium and Terbium.

The front-end process is situated at the Johannesburg facilities of the Council for Mineral Technology

(Mintek), a leading test facility for mineral processing, extractive metallurgy, and related fields, and commissioning of the first stage is complete.

The front-end process incorporates the front-end gypsum washing, acid leach, fluoride removal via continuous ion-exchange (CIX), Rare Earth precipitation and a sulphuric acid agitated bake (SAAB) to produce a mixed rare earth sulphate, which will subsequently be shipped to the Rare Earth separation plant situated at K-Technologies (K-Tech) in Lakeland, Florida, USA, for separation into Rare Earth oxides.

Phase two of the pilot plant comprises the back-end situated at K-Tech, which will water-leach the mixed Rare Earth sulphate into a pregnant leach solution (PLS), perform a Cerium rejection step to minimise flows downstream (thereby further reducing operating costs and capital expenditure) into the CIX circuit for loading onto the cation resin before stripping and going into the final continuous ion chromatography (CIC) step, which will produce the individual Rare Earth oxides using K-Tech's patented CIX/CIC technology.

The construction of the back end of the pilot plant is said to be well-advanced at K-Tech's facility in Lakeland, with commissioning due to start in 3Q23.

Investment Thesis

The pilot plant in South Africa offers the potential to establish Phalaborwa as an economically viable producer of mixed Rare Earth sulphates on a standalone basis. The critical metals "scare" means that there is a high demand in Western markets for a mixed Rare Earth sulphate product, ahead of the final beneficiation step that will be undertaken using the K-Tech process.

The ability to produce separated Rare Earth oxides puts Rainbow/K-Tech in the exclusive club of oxide producers within the Rare Earth supply chain for magnets, with a separated Rare Earth oxide product at 99.95% purity that can be sold directly to permanent magnet manufacturing capacity currently being developed in the USA and aligned countries.

In particular, the company is exploring the potential to establish its back-end Rare Earth oxide separation process in the USA and has identified a potential site for a commercial scale plant. This would establish it as one of the first producers of separated rare earth oxides in the US.

We added an initial **LONG** position in Rainbow to the Model Resources Portfolio in March of 2021 and stock price has only headed downwards since. Despite this we are sticking with our twelve-month target price of 17 pence per share.

Teck & Glencore – All Quiet on the Western Front

Teck is currently hiding in its hole in the prairie like some tiny creature that thinks it has beaten off a ravening hyena. Meanwhile above ground, Glencore is pacing about taking chunks out of whatever other edible species roams by, such as a 9.99% stake in Stillwater Critical Minerals and then popping up as a driving force in the ACG mega-listing in London. It also proposed to buy the remaining stake in copper miner PolyMet Mining (PLM.A) it does not already own for about $71mn. Glencore already owns 82.26% of PolyMet.

We were fortunate to attend the Melbourne Mining Club dinner (with EQ Resources and other Tungsten players) in London's Guildhall at the very end of the month, where the guest speaker was Glencore's Gary Nagle. The discussion was wide-ranging, but he did let slip that he "did not know what Glencore would look like" if it took over Teck. We suspect this is just putting on a brave face, but we would not be surprised if Glencore ends up with the metcoal business and Teck harvests an enormous pile of cash to pursue its own predatory actions. We managed to get a word in at the Q&A and asked about the assertion that the Teck bid was "bad for Canada" which generated a shower of platitudes about "paying its taxes". Not impressed…

Essential Metals (ESS.ax) – Baulking at the Panda Hug

In late April, Essential Metals (the sometime Cesium miner) rejected an AUD$136mn (US$91.16mn) takeover offer from a joint venture led by China's Tianqi Lithium (002466.SZ) and Australian miner IGO Ltd (IGO.AX). Just before that the lithium developer's largest stakeholder, a unit of Mineral Resources (MIN.AX and sometime partner of Neometals at Mount Marion), raised its stake to 19.55%, effectively blocking the bid by Tianqi Lithium Energy.

Essential's Pioneer Dome lithium project in the southwest of Western Australia and approximately 100 km from Mineral Resources' Mt Marion operations.

Then in recent days, Mineral Resources gave its blessing to an AUD$152.6mn all-share takeover offer by Develop Global (DVP.ax), which the board of Essential recommended to shareholders. Essential shareholders will receive one new Develop share for every 6.18 Essential shares held at the record date.

Mineral Resources is the second-largest shareholder in Develop with a 12.87% stake. Develop's biggest shareholder is mining executive Bill Beament, who has a 19.42% stake.

Parting Shot

The dirty little secret of the lithium *salar* business is that it doesn't take much in the way of drilling to come up with a resource and generally that drilling is inexpensive (dare we say "cheap"). Thus, when one sees a company that has part of a *salar* (usually in Argentina, alas) and they have scarcely anything in the way of drilling and certainly no resource, then one's mind should flash the word "FAKER" in letters as large as those of the HOLLYWOOD sign. *Salar* drilling is not expensive, *salar* drilling is not deep and divining a resource from the results of a rather scant array of holes should yield a resource. If none of this has been achieved it's because the management clearly believe that there is nothing to be found, or reported, or that an indecent haste to a resource would then beg the question of "what next?". And that question to a Vancouver or West Perth promoter is akin to garlic's effect on Dracula.

Those parts of *salares* not in the hands of foreigners are principally in the hands of Argentines and these are not developers, or even explorers. These are flippers, pure and simple. Some are holders of tens of thousands of hectares that they have heard are worth hundreds of millions of dollars. Most do not realise that their blessed tenements are little more than guanaco-pasture (akin to the moose-pasture of our more northern brethren). These locals find themselves with no buyers, as they do not realise that other scamsters do not pay high and sell low…. As the Argentines do not know what exploration actually involves, they have no way of assessing what their own "assets" are worth beyond folk rumour and self-aggrandised valuations. Even the Argentines would tell you the joke that the easiest way to make a turn is to buy an Argentine for what he is worth and sell him for what he thinks he is worth.

Still the alarm bells have gone off in corporate Argentina and some want part of the action. Tecpetrol, for instance, has recently offered CAD$241mn for Alpha Lithium (NEO:ALLI, OTCMKTS: APHLF). Some in the trade think scant of Alpha's virtues, while others think that Tecpetrol may know the oil & gas business but wouldn't know a pig in a poke if it oinked at them. This is truly a case of selling ice to the eskimos, as Tecpetrol's owners are the mighty Roca family, who are the kings of seamless tubes at the global level (via Techint) but know little of lithium.

Lithium *salares* are being seen by some lazy promoters as the ultimate perfect pursuit. "No need to drill" and the old rag-trade adage of "don't mind the quality…. feel the width" being the motto *du jour*.

Recent & Upcoming

In the last month we published an update on the Teck takeover battle and our initiation of coverage on Gold Line Resources.

In coming weeks, there are scheduled Initiation on African Gold. There is also planned an update on developments in the Argentine nuclear energy & uranium scene, a sector review on Tungsten and potentially a sector review on Boron wannabes.

MODEL RESOURCES PORTFOLIO @ END JUNE

	Security	Ticker	Currency	Price	Change last 12 mths	Change last mth	12-mth Target
LONG EQUITIES							
Diversified Large/Mid-Cap	Hochschild	HOC.L	GBP	0.719	-39%	-8%	£1.00
	Sherritt International	S.to	CAD	0.48	-33%	-4%	$0.95
Uranium	Sprott Physical Uranium	U.UN.to	CAD	12.65	-25%	-3%	$16.00
	GoviEx	GXU.v	CAD	0.13	-65%	-7%	$0.25
Zinc/Lead Plays	WisdomTree Zinc ETF	ZINC.L	USD	7.80	-38%	6%	$11.00
	Luca Mining	LUCA.v	CAD	0.48	45%	26%	$0.70
Silver Explorer	Southern Silver Exploration	SSV.v	CAD	0.18	-25%	0%	$0.28
	Norseman Silver	NOC.v	CAD	0.06	-63%	0%	$0.12
Silver ETF	IShares Silver ETF	SLV	USD	20.89	-1%	-5%	$24.00
Gold Producer	Soma Gold	SOMA.v	CAD	0.51	65%	-7%	$0.85
	Asante Gold	ASE.cn	CAD	1.71	452%	-15%	$2.40
	Orvana Minerals	ORV.to	CAD	0.14	-55%	-22%	$0.32
Gold/Antimony Developer	Perpetua Resources	PPTA.to	CAD	4.85	8%	-25%	$7.50
Metallurgical Coal	Colonial Coal	CAD.v	CAD	1.52	-7%	-4%	$2.45
Royalties	Elemental Altus Royalties	ELE.v	CAD	1.17	-20%	-6%	$1.52
Copper Explorers	Panoro Minerals	PML.v	CAD	0.14	-18%	8%	$0.30
	Phoenix Copper	PXC.L	GBP	0.22	-56%	-16%	£0.30
	Aldebaran Resources	ALDE.v	CAD	0.89	37%	9%	$1.32
Tungsten	Almonty Industries	AII.v	CAD	0.60	-29%	-22%	$0.95
	EQ Resources	EQR.ax	AUD	0.07	21%	0%	$0.13
Graphite Developer	Blencowe Resources	BRES.L	GBP	0.048	9%	-4%	£0.09
Cobalt	Jervois Global	JRV.ax	AUD	0.07	-92%	-22%	$0.35

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MODEL RESOURCES PORTFOLIO @ END JUNE

	Security	Ticker	Currency	Price	Change last 12 mths	Change last mth	12-mth Target
LONG EQUITIES							
Vanadium Developer	Vanadium Resources	VR8.ax	AUD	0.07	-50%	-13%	$0.14
Lithium	Neometals	NMT.ax	AUD	0.50	-69%	-21%	$0.75
	Lithium Power Intl	LPI.ax	AUD	0.30	-62%	-6%	$0.80
	Century Lithium	LCE.v	CAD	0.97	-25%	3%	$2.38
Cesium/Lithium	Essential Metals	EXX.ax	AUD	0.42	-36%	-9%	$0.55
Scandium Developer	Scandium International	SCY.to	CAD	0.05	-50%	0%	$0.11
Gold Explorer	Cabral Gold	CBR.v	CAD	0.12	-70%	9%	$0.20
	Gunpoint Exploration	GUN.v	CAD	0.59	-3%	5%	$0.75
	Desert Gold	DAU.v	CAD	0.06	-40%	0%	$0.18
	MetalsTech	MTC.ax	AUD	0.23	-8%	-23%	$0.45
Rare Earths	Rainbow Rare Earths	RBW.L	GBP	0.095	-30%	17%	£0.17
	Neo Performance Materials	NEO.to	CAD	8.20	-36%	0%	$14.60
Tin Miners	Alphamin	AFM.v	CAD	1.00	-28%	20%	$1.35
	Metals X	MLX.ax	AUD	0.28	-62%	0%	$0.38
Mineral Sands	Sheffield Resources	SFX.ax	AUD	0.48	-17%	2%	$0.72
Oil & Gas	Shell	SHEL.L	EURO	23.42	8%	3%	£24.00
SHORT EQUITIES							
Shorts	NioCorp	NB.to	CAD	6.68	-33%	-7%	$4.00
	Golconda Gold (ex-Galane Gold)	GG.v	CAD	0.20	-69%	14%	$0.13
	Cleantech Lithium	CTL.L	GBP	0.4178	47%	-15%	£0.25
	Texas Mineral Resources	TMRC	USD	0.83	-60%	-14%	$0.30

Important disclosures

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