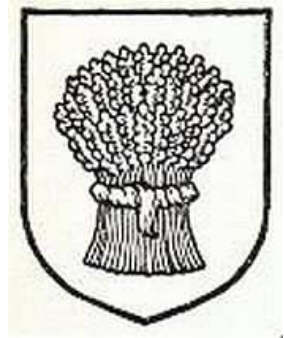


Friday, May 4, 2018



HALLGARTEN & COMPANY

Portfolio Strategy

Editor: Christopher Ecclestone
cecclestone@hallgartenco.com

Model Mining Portfolio: Lack of Direction in the Main Metals

Performance Review – April 2018

Model Mining Portfolio

Main Metals Remain Directionless

- + **Despite the doomsters economic growth at the global level is undimmed with a healthy rebalancing away from China dependence**
- + **Auguries appear good for President Trump to take action on uranium imports/dumping which should electrify the uranium miners in the US**
- ✗ **The potential for interest rate rises is (supposedly) casting a pall on growth prospects and, in turn, on metals prices**
- ✗ **The Gold price teeters near the \$1,300 per oz support level**
- ✗ **Base metals continue to drift without direction**
- ✗ **Cobalt prices have started to flatten out despite the difficulties of Glencore in the DRC**

Dysprosium – The Dark Horse in the REE Stakes

We have often likened the REE space to a horse race. Usually the metaphor was regarding the companies in the field and attempting to predict which shall make it to the finish line and which shall end up getting sent, metaphorically-speaking, to the glue factory.

However, in another respect the Lanthanide Stakes has ended up being perceived as a two-horse race amongst the elements in the series with all the other runners, excepting Neodymium and Praseodymium being scratched before the starting gun. Of course this reflects yet again the short-termism of the analytical community who have trouble remembering the day before yesterday let alone the uses to which Lanthanides were put in the 1950s or, heaven forbid, the 1910s. Rare Earths were around before they arrived and will be here well after they are gone.

The usages are continually morphing and, who knows, even the fevered imaginings of one Praying Mantis-like Vancouver newsletter writer who claimed in 2010 that Cerium would save the global water supply from contamination may yet be proven right. One of the horses that should not have been scratched from the race though is Dysprosium as it is still up and running and dare we say it, racing up on the outside and potentially giving those wagering on deposits slanted towards Dysprosium their moment of glory in the Winner's Circle.

These thoughts have been prompted by the publication of a report by Adamas Intelligence dedicated to Dysprosium alone and its outlook. This in itself is a rarity as the reports on the space have usually

covered the whole suite of Lanthanides. Copies of this are now filtering around the Rare Earth space like a samizdat novel by Solzhenitsen back in the days of the USSR.

Who Uses It?

The main use, indeed the overwhelming application, for Dysprosium oxide consumption each year is for production of NdFeB permanent magnets. From 2013 through 2017 Adamas Intelligence estimates that over 99% of global Dysprosium oxide (or oxide equivalent) went into the production of NdFeB magnets.

Dysprosium is commonly added to NdFeB permanent magnet alloy for use in applications involving elevated temperatures (above 80 °C) and/or strong demagnetization fields.

With the addition of Dysprosium (and often Terbium) to NdFeB, the maximum operating temperature of the material can be tripled (up to 240 °C), making NdFeB the ideal material for an ever-growing list of end-uses and applications.

From 2013 through 2017 Adamas Intelligence estimated that electric mobility and industrial applications were the greatest demand drivers of Dysprosium oxide (via use of Dy-containing NdFeB), followed by wind power, and vehicle accessory motors.

The Report

The key findings of the Adamas report were:

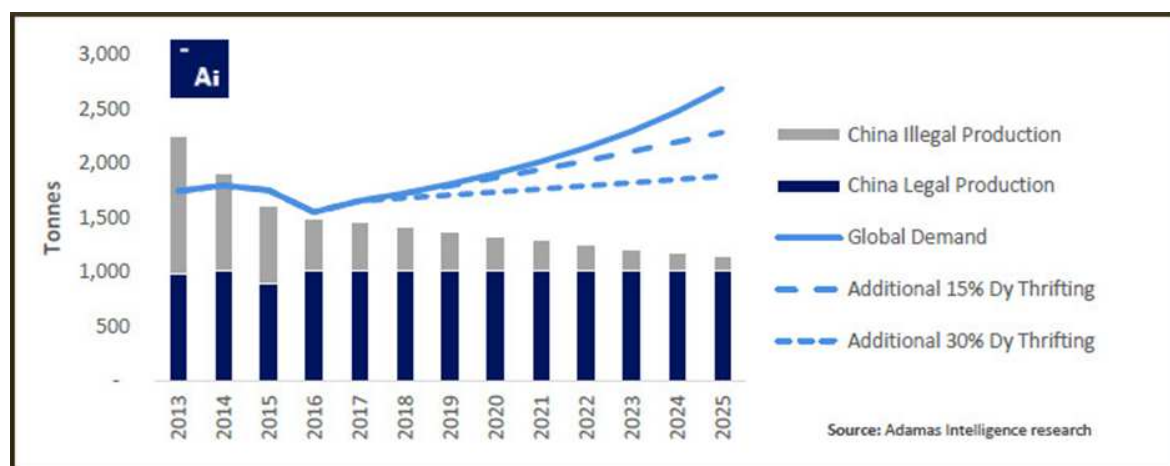
- ✘ An ongoing government-led crackdown on illegal rare earth mining in China has led to a 34% reduction in global dysprosium oxide production since 2013
- ✘ Looking ahead, Adamas Intelligence believes that China's production alone will be insufficient to support global demand growth
- ✘ In fact, by 2025 China's demand for dysprosium oxide for electric vehicle traction motors alone will amount to 70% of the nation's current legal production level, emphasizing the imminent need for new supplies
- ✘ Outside of China, there are a handful of advanced rare earth development projects with potential to add significant quantities of dysprosium oxide production annually by 2025
- ✘ If automakers, motor manufacturers, and other end-users of high-temperature NdFeB do not act today to secure long-term supplies, they will soon find themselves amidst a sellers' market scrambling for rare earth motor metals the same way many are scrambling today for battery metals

Let's look at these challenges.

The first two challenges are linked. They are to some degrees the cause and the effect. China has, surprisingly let its garden of Rare Earths go to wrack and ruin. The oft quoted comment of Deng Xiao Ping is that Rare Earths will be to China as oil is to Saudi Arabia. However, if Saudi Arabia let its domination slip away by underpricing its product and then letting its sources of production decay into environmental disasters or hastening their demise through high-grading or illegal mining then we might agree that they are alike. China has, like Saudi Arabia, from time to time sought to manipulate lower the price of Rare Earths (or oil) to maintain dominance. But while Saudi Arabia is in no danger of running out of product, China is in a danger zone with respect to Rare Earths.

That production has declined by the extent that Adamas claim is no surprise but that prices have not risen commensurately, or indeed exponentially, is probably a product of the Chinese suppression of prices (combined with a frittering away of stockpiles/reserves) to ensure that the wicked West don't get traction with projects destined to create REE independence from the Chinese mothership. In itself that is a reckless short-termist policy because the Chinese are transfer pricing scarce Rare Earths to the West in exchange for a transitory dominance. After all, ask yourself the question, who now knows or care that the English city of Manchester was once the dominant force in the global cotton trade? Sic transit gloria mundi.

The chart produced by Adamas (below) tells the story better than a thousand words could. As can be noted a market that was in surplus due to illegal mining is now just in deficit and the deficit is going widen either significantly or enormously depending on one's view on EV take-up and efforts by users to reduce the Dysprosium component in their product formulas.



Just as the Chinese surge in EV demand is seen as the great hope of the Lithium, Cobalt and Neodymium/Praseodymium producers, thus a problem is born for all those outside the attempts by the Chinese government to create a "Closed Circle of Prosperity" (read , circling of the wagons) with regards to resources needed to fuel this boom.

Obviously the Chinese will want their Dysprosium to go into their EVs before any other export markets

are served. Adamas is arguing that the Chinese will essentially be using most of what they produce for themselves leaving other international auto manufacturers (and other Dysprosium applications) unserved. Essentially non-Chinese sources will need to be the main ones for non-Chinese users of Dysprosium. The only serious new source of Dy is the Brown's Range project of the ASX-listed Northern Minerals.

Adamas Intelligence estimates that, from 2013 through 2017, the global consumption of Dysprosium oxide (or oxide equivalent) for BEV traction motors increased at a blistering CAGR of 54%, from 11 tonnes to 61 tonnes, while global consumption for PHEV traction motors increased at a CAGR of 31%, from 23 tonnes to 68 tonnes.

Collectively, BEV, PHEV and hybrid electric vehicle (HEV) traction motors were responsible for just 18% of total global Dysprosium oxide consumption in 2017 but, at the current rate electric vehicle sales are growing, are poised to become the dominant end-use of Dysprosium oxide by 2025. This is why we would posit that Dysprosium is the dark horse in the Lanthanide Stakes.

The next assertion of Adamas on the number of projects outside China as being a "handful" we would challenge. The term handful implies five and frankly we cannot name five projects that might be in production by 2020. The only two that seem destined to produce in the short-term are Rainbow Rare Earths and Northern Minerals. While we admire the determination of other survivors, imminent production is not likely. As for Rainbow we are rather bemused to be unable to find a resource statement for the Gakara deposit that might elucidate its Dysprosium content. The fact that Nd/Pr are the only words on Rainbow's lips we can only presume they are Dy-light. Therefore as Agatha Christie would put it, "then there was one".

Finally we get to the fifth finding that the automobile sector will be scrambling. Well, it couldn't happen to a better collection of short-sighted managers in our opinion. Lazy, feckless and shiftless are words that come to mind. The mantra is that "Just-in-time will provide", as if "just in time" was some sort of divine providence. Instead it is (was?) a cargo cult that shall henceforth be failing to deliver. Adamas claim the buyers will be "scrambling". But scrambling where? If there is none available outside China and the Chinese won't let go of what they have they can scramble as much as they like and they will look like hamsters running futilely in their wheel in the cage. The time to back projects is now if the crunch is to be avoided.

Conclusion

So the Great Dysprosium Crisis of 2020 will come as a "surprise" to the powers that be. And yet the warning signs are there for everyone to see. The Adamas report is a red flag so large they could fly it in Tiananmen Square and yet when they will be searching for who to blame when no supply is available the cry will go up "how were we to know?". Ever was it thus is the corporate suites of the Western corporations who are supposedly the custodians of shareholder value. They were warned.

Portfolio Changes

There was only one portfolio change during the month of April:

- Opened a Short position in Cobalt 27 Capital. Sold 12,000 shares in KBLT.v at CAD\$12.43 cents per share on April 6th.

The Cobalt market has left reality behind and one of the most bizarre stories is the Cobalt stockpiler, Cobalt 27, which managed to pull off a \$130mn financing recently. Why investors cannot buy their own stocks and maximize flexibility is beyond us. Some of the arguments that Cobalt 27 use to justify their quasi-corner of the Cobalt market come right out of the Hunt Brothers hymnbook.

Noble Group continues in a state of flux with a debt restructuring being thwarted by the equity holders. However reports indicate that the Trump tariffs on aluminium on China have proven to be a major boost for business at Noble.

The Portfolio Move

The portfolio rebounded strongly in April closing at \$5.111mn up from \$4.974mn at the end of March. Cash rose again to \$1.49mn from \$1.373mn during the month due to proceeds from the Cobalt27 Short sale.

Parting Shot

Our senior partner in the days of Buenos Aires Trust company used to refer to the dangerously and blithely feckless with the term “as dangerous as a monkey with a razor-blade”.

The vivid word picture comes back to mind when considering the two recent incursions of Wall Street investment banks into the lithium space. First we had Goldman Sachs with the priceless “Lithium is the new petroleum” which laughably confused the storage mechanism with the energy source. No vehicle is powered by Lithium whereas petroleum is the power source for internal combustion engine. So “Lithium is the new Lead” would be more correct but far less sexy.

More damaging was the appearance out of nowhere of Morgan Stanley’s “expert” on Lithium and Battery Metals bringing tales of woe and imminent doom. Comments of “came down in the last shower” might be uncharitable but frankly when someone that no-one in the Lithium space has heard of prognosticates as if Papal Infallibility is theirs, then it’s up to those in the space to call a spade a spade. Interlopers should be called out for what they are. Certainly one hears opinions from veterans in specialty metals spaces that one disagrees with (the Rare Earth space had more opinions than pundits in its heyday) but when one hears opinions from nobodies that get their credence from the reflected glory of the firm they work for (which is not known even for mining research of any kind) then it should be given appropriate weighting ... featherweight at best.

The industry needs to call out Wall Street interlopers that wake up one day and decide that they are

instant experts. Molycorp was the biggest indictment of this phenomenon. These analysts are downright dangerous and show the rot starts at the top.

Mining Model Portfolio as at: 4-May-18

Security	Initiated	Currency	Price Avg.	Current	Portfolio Weighting	Increase in Value	Target	
Long Equities								
Various Large/Mid-Cap	Teck Resources (TECK.B)	5/29/2009	CAD	22.46	32.84	10.0%	46.2%	\$38.00
	NevSun (NSU)	3/23/2012	CAD	3.45	3.51	4.1%	1.7%	\$5.00
	Sherritt International (S.to)	7/11/2013	CAD	1.78	1.16	4.1%	-34.8%	\$2.50
	Metals X (MLX.ax)	29/5/2014	AUD	0.98	0.89	2.7%	-9.0%	\$1.00
Trading House	Noble Group (CGP.SG)	15/11/2017	SGD	0.2	0.08	1.3%	-59.8%	\$0.30
Uranium	Uranium Participation Corp (U.to)	10/20/2010	CAD	7.01	3.98	2.3%	-43.2%	\$6.00
	Western Uranium (WUC.cx)	7/5/2016	CAD	2.25	0.65	0.9%	-71.1%	\$4.80
	GoviEx (GXU.v)	6/29/2015	CAD	0.08	0.19	5.4%	131.2%	\$0.50
Zinc/Lead Plays	Zinc ETF (Zinc.L)	1/15/2010	USD	7.04	8.86	2.7%	25.9%	\$11.00
	Canadian Zinc (CZN.to)	12/9/2011	CAD	0.82	0.13	0.4%	-84.1%	\$0.70
	Ascendant Resources (ASND.v)	10/31/2016	CAD	0.49	0.95	6.5%	94.3%	\$1.70
	Telson Mining (TSN.V)	3/19/2018	CAD	0.79	0.83	6.8%	5.1%	\$2.00
	Nyrstar (NYR:BR)	9/28/2009	Euros	65.1	5.43	3.6%	-91.7%	€ 11.00
	Southern Silver Exploration (SSV.v)	8/25/2016	CAD	0.24	0.485	2.8%	102.1%	\$0.94
Gold Producers	Para Resources (PBR.v)	2/17/2017	CAD	0.23	0.23	2.7%	0.0%	\$0.58
	Westgold (WGX.ax)	12/6/2016	AUD	2.01	1.53	3.1%	-23.9%	\$2.40
Copper Producer	Coro Mining (COP.to)	2/23/2015	CAD	0.03	0.09	2.1%	200.0%	\$0.30
	RNC Minerals (RNX.to)	11/17/2016	CAD	0.33	0.22	1.5%	-33.3%	\$0.60
Royalty Trust	Abitibi Royalty (RZZ.v)	5/31/2017	CAD	9.1	10.1	2.6%	11.0%	\$18.00
Processor	IBC Advanced Alloys (IB.v)	4/29/2016	CAD	0.3	0.31	0.7%	3.3%	\$1.40
Driller	Cabo Drilling (CBE.v)	9/28/2016	CAD	0.025	0.01	0.5%	-60.0%	\$0.08
Tungsten Producer	Almonty Industries (AII.v)	7/31/2015	CAD	0.36	0.43	5.0%	18.6%	\$1.00
Copper Explorer	Asiamet Resources (ARS.v)	4/28/2016	CAD	0.05	0.12	4.1%	131.0%	\$0.12
	Panoro Minerals (PML.v)	1/22/2018	CAD	0.35	0.37	2.6%	4.3%	\$0.65
	Western Copper & Gold (WRN.to)	4/25/2017	CAD	1.57	1.06	2.5%	-32.5%	\$2.74
Lithium	Neometals (NMT.ax)	7/31/2014	AUD	0.04	0.31	3.5%	737.8%	\$0.45
	Lithium Power Intl (LPI.ax)	10/25/2017	AUD	0.44	0.29	2.0%	-34.1%	\$1.38
Scandium Explorer	Scandium International (SCY.to)	8/23/2016	CAD	0.14	0.19	2.7%	35.7%	\$1.00
Gold Explorer	Banyan Gold (BYN.v)	11/14/2017	CAD	0.07	0.06	1.8%	-14.3%	\$0.25
Graphite Producer	Elcora Resources (ERA.v)	29/5/2014	CAD	0.2	0.27	3.2%	35.0%	\$0.64
Graphite Developer	Talga Resources (TLG.ax)	8/25/2016	AUD	0.27	0.74	4.2%	179.2%	\$0.90
REE Explorer	Northern Minerals (NTU.ax)	6/9/2011	AUD	0.23	0.1	1.5%	-57.4%	\$0.28
NET CASH						\$1,490,261		
Short Equities								
Shorts	Bacanora (BCN.L)	12/4/2015	GBP	0.825	0.92	23.3%	-11.0%	£0.60
	Lithium Americas (LAC.to)	10/25/2017	CAD	10.1	6.43	21.9%	36.3%	\$5.00
	Cobalt27 (KBLT.v)	4/6/2018	CAD	12.43	12.4	36.10%	0.20%	\$9.00
	Galane Gold (GG.v)	4/28/2016	CAD	0.06	0.07	18.70%	-16.70%	\$0.03

Current Cash Position	1,490,261
Not Covered	319,092
Net Cash	1,809,353
Current Value of Bonds	0
Current Value of Long Equities	3,301,689
TOTAL VALUE OF PORTFOLIO	5,111,042

Important disclosures

I, Christopher Ecclestone, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

Hallgarten's Equity Research rating system consists of LONG, SHORT and NEUTRAL recommendations. LONG suggests capital appreciation to our target price during the next twelve months, while SHORT suggests capital depreciation to our target price during the next twelve months. NEUTRAL denotes a stock that is not likely to provide outstanding performance in either direction during the next twelve months, or it is a stock that we do not wish to place a rating on at the present time. Information contained herein is based on sources that we believe to be reliable, but we do not guarantee their accuracy. Prices and opinions concerning the composition of market sectors included in this report reflect the judgments of this date and are subject to change without notice. This report is for information purposes only and is not intended as an offer to sell or as a solicitation to buy securities.

Hallgarten & Company or persons associated do not own securities of the securities described herein and may not make purchases or sales within one month, before or after, the publication of this report. Hallgarten policy does not permit any analyst to own shares in any company that he/she covers. Additional information is available upon request.

Hallgarten & Company acts as a strategic consultant to Northern Minerals, Para Resources, Panoro Minerals, Telson Mining and Lithium Power International and as such is compensated for those services, but does not hold any stock in those companies, nor has the right to hold any stock in the future.

© 2018 Hallgarten & Company Limited. All rights reserved.

Reprints of Hallgarten reports are prohibited without permission.

Web access at:

Research: www.hallgartenco.com