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On Friday's Close

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Concrete carbon emissions give graphene an opening

It is interesting that the Sentiment Oscillator continues to weaken each week while the leading indices are back into uptrend, including the oil and mining indices. Smaller stocks are clearly not on the table at the moment.

Concrete carbon emissions give graphene an opening

Extending the climate change debate beyond transport and energy leads us to the next elephant in the room; the production of steel and concrete. Together, these contribute "as much as 16% of annual carbon dioxide emissions" according to the New Scientist, p.39, 16 November 2019. Addressing these sources of carbon emissions will be much more problematic than energy storage.

Looking at steel first, which uses iron ore and coking coal in blast furnaces, Adam Vaughan suggests an alternative would be to use more recycled steel from electric arc furnaces to reduce emissions by 66%, but that is hardly a solution. It is not as if there is enough scrap steel around to be able to displace new steel, and some industries actually prefer virgin steel in any case, due to fewer impurities. Think about how much electricity is needed to operate an EAF, and ask if alternative energy is going to be able to supply such intense power. Vaughan says it can, in principle, but what about in reality? Iron ore producers such as BHP, FMG and RIO shouldn't be too worried at this point. As another observation, what country is the largest producer of steel? China, of course.

Vaughan does suggest that a new process out of Sweden called HYBRIT could use hydrogen rather than coking coal, leaving almost no carbon footprint, but this is still in the realms of science fiction. In any event, hydrogen is made from fossil fuels and it has a very large carbon footprint already; as much as UK's and Indonesia's combined. So, this is not a helpful alternative. It would also cost 30% more.

Turning to concrete, we see that the manufacturing of cement involves the calcination of limestone in energy hungry rotating kilns, then the conversion to calcium oxide releases CO₂. Further energy is used to make clinker, which is added to gypsum to make cement. Industry operators don't see any greener alternatives to the Portland cement formula unless you make a different kind of cement by adding substitutes. But, adding blast furnace slag or fly ash circles you back to the very issues you are trying to circumvent. Calcium silicate slag has been suggested but this is more expensive and there is a shortage of product. Everything is still in the R&D stage, so there is no commercial quick solution.

So now we get to his punch line. The quickest climate change for both concrete and steel may be the simplest: use less of it and make it last longer. So graphene, step up to the plate!

First Graphene has been researching the addition of its PureGRAPH range of products to concrete, with very impressive results. Adelaide University has shown that by adding as little as 0.02% w/w PureGRAPH to concrete it has achieved a 34% increase in compressive strength and a 27% increase in tensile strength, when tested to international standards. Further, there is a substantial reduction in permeability (> 50%), limiting the ingress of moisture that leads to concrete cancer. The PureGRAPH concrete additive was introduced as a concrete admixture directly into the water for preparing the concrete mortar. No additional mixing equipment or processing steps were required.

The strength improvements are dependent upon the quality of graphene used, with the higher aspect ratio graphene providing the best improvement. PureGRAPH has an unusually high aspect ratio, making it the best additive.

So, there is an alternative method to what Vaughan was suggesting. Graphene could make a serious difference to concrete industry carbon emissions due to the ability to make stronger, lighter concrete structures that will have longer lives. What's not to like?

Supply is still an issue as world production capacity of graphene, be it PureGRAPH or some other brand, would need to be ramped up by thousands of percent. FGR's current capacity of 100 tpa of PureGRAPH would be consumed in only 500,000 t of concrete, but it is capable of rapidly expanding production.

As far as steel goes, graphene is not something that can be readily added to steel to make it stronger and lighter, but adding graphene to polymers and plastics will make them much stronger and more viable as a fire proof substitute to metal such as in car panels or other sheet metal uses. Graphene's day is coming.

Disclosure: Interests associated with the author own shares in First Graphene and have received capital raising fees in the past. The author is the non-exec. chairman of FGR.

High grades in Alicanto's first two holes

During the week Alicanto reported assays from the first two drill holes at its Lustebo prospect, in the Bergslagen Project. The first hole, 19-01, returned very good grades of 4.2 gpt gold, 43 gpt silver, 2.2% copper and 1.7% zinc, over a 2.5m intercept, which is approximately true width. The massive sulphide zone was actually much higher grades of 13.1 gpt gold, 126 gpt silver and 6.43% copper with lead and zinc. The second hole was a similar width but grades were lower.

As usual people ask what this means? Is it a buy or sell on these results? The first point is that these are the first two holes and as such, they must be viewed positively. The intercepts were at approximately 100m below the surface,

with no drilling at shallower levels. They hit their targets, enabling extrapolation above and below. Hitting massive sulphides is a big plus. The next step will be to do down-hole EM to better target where the best concentrations of mineralisation may be.

We should remember that this is in a structurally complex location and the more complex it is, the more opportunity for mineralisation to have found locations for deposition. It is not as simple a drilling a square block. There will be bends and folds that will give a range of widths and grades, some good and some lesser so. The use of down-hole EM and follow-up drilling will gradually enable the construction of an informed model of what the orebody will look like, but until then, we have to satisfy ourselves with the knowledge that Lustebo is a legitimate high-grade prospect. It is a great start to a rejuvenated future, so shareholders should be pleased.

The drilling is now turning to test prospects at Oxberg and Skyttgruvan, elsewhere the Bergslagen Project. (see *FEC research report released on 16 November. Available on the website*).

Disclosure: Interests associated with the author own shares in Alicanto Minerals and may have received capital raising fees in the past.

Davenport continues to be fundamentally cheap

About a year ago (17th, 24th November, 2018) we introduced Davenport Resources, an emerging potash company that was priced by the market at a fraction of what fundamental analysis suggested it was worth. It has good projects with extensive resources in a safe jurisdiction and ever so importantly, the experienced technical management to take the project forward. Hence, it looked like a good opportunity if you could believe the spreadsheet and if markets were entirely rational, but getting to the starting gates is as far as spreadsheet analysis will get you. At the end of the day you need money, and lots of it.

After performing well in the market a year ago, the share price has drifted back to be even lower. Hence the frustration expressed by the CEO, Chris Gilchrist, when he dropped in to see me last week. I'll remind you of the merits of Davenport again, and then I'll address the company's problem with getting the attention in the market place.

In "the cradle of potash"

DAV holds three perpetual mining and two exploration licences in "the cradle of potash", being the South Harz potash basin in Central Germany. More than 180 Mt of potash has been mined since the 1890s, in close proximity to Davenport's leases. The East German Government drilled much of the orebodies in the 1960s to 1980s, enabling the calculation of a JORC Inferred Resources standard, comprising 4.9 billion tonnes at 10.6% K₂O. This is sufficient to support four sizeable mines. As you would expect in Germany, all the necessary infrastructure to support a mine development is on hand. There continues to be a serious barrier to entry in the potash business though; capital costs.

At the moment DAV holds a 100% equity in these licences. The key to taking these projects further is the ability to successfully negotiate joint ventures with sizeable companies that can lend their balance sheets to support

project finance. So, it is a matter of what percentage equity can be retained, initially through to a decision to mine, and thereafter. With a market capitalisation of less than \$10m today and cash levels that are generally around \$1m, spending large sums in the field is not an option. Executive time will be spent designing, planning, achieving approvals, and conducting studies that will encourage potential joint venture partners to engage.

Even though the Company has completed several scoping studies to cover a range of development opportunities, it is not allowed to share the information with its shareholders (the true owners of the company). This may sound stupid, but who am I to call the ASX stupid? Read the paragraphs below regarding the limitations on what the ASX allows to be said.

Comparative analysis is a useful tool in analysing any mining sector as it highlights the differences in valuations amongst competing companies, but it doesn't always explain why the market may treat one company more favourably than another. There will always be qualitative factors that rely on beliefs and opinions rather than clinical facts and of course, there will be biases (yes, no matter how politically incorrect biases are, they will always be part of human nature).

I have attached a table in a separate document that gives a snapshot of a few listed potash companies. This is work in progress with information extracted from ASX releases. I'll add to it and keep it up to date over time.

Limitations on What ASX Allows Companies to Say

Nowadays the ASX does not allow companies to release Scoping Studies unless they have a JORC compliant Indicated Resource. Inferred Resources are not good enough. Companies are free to complete a study, and in fact they should do so in order to see if the project has enough merit to warrant the expenditure on another round of drilling that could take the resource from the Inferred to Indicated, but they are not allowed to inform their shareholders (the owners of the business) of the findings of a Scoping Study. How does that help shareholders to evaluate their investment? Surely they have a right to know, and the ASX has no right to keep shareholders in the dark.

Yes, we know that exploration is a risky business, but risk doesn't stop with exploration. You subsequently have financing risk, engineering, development and commissioning risk. Thereafter you have operating and management risks, not to mention commodity price risk. At no time is a mining project ever risk free. So, what determines the ASX's right to intervene and dictate that it is too risky to expose shareholders to the information contained in a Scoping Study just because a statistical calculation hasn't been satisfied.

A Scoping Study should be an early stage evaluation as to whether there is any chance that a project may have commercial legs if certain parameters are satisfied. One of those parameters will always be the better definition of the in-ground resource. Having an Indicated Resource is only one consideration.

Basically, by not allowing shareholders access to the information it is going against its publicly pronounced policy

of continuous disclosure. It is both hypocritical and bad public policy.

The mal-administration and suppression of information is amplified by the way ASIC is gradually squeezing analysts out of the industry, be they "independent" or associated with larger organisations where Chinese Walls are best used for protecting mushrooms.

For many decades a good analyst, with a few years experience, was a valuable tool who could help brokers and their clients to get the correct story. They increased the efficiency in the industry in the distribution of information and in the exposition of disinformation. It was a way that industry could help raise standards of honesty and accuracy rather than relying on regulation that has sought to impose honesty (a cute concept, but dishonest people will always ignore the rules). However, now the rules suppress information and opinions from professional and knowledgeable parties. Where has that left us?

We now have an information void that is getting worse. Social media and chat sites have moved into this void big time but that has only exacerbated the problem. These sites are full of ill-informed comments from people who may be searching for the truth, but they have to wade through quagmires of falsehoods and misinformation along the way without ever knowing who is telling the truth. It is a nightmare of unaccountability.

If ASIC wants to get serious about stamping out inside trading and share price manipulation it should be regulating these avenues to ensure at least a minimal level of responsibility and accountability, even if it is too much to be seeking professionalism. It is failing in its duty to the public by standing aside.

So, the outcome is that the smaller end of the market is becoming more risky for investors as accountability for information is diminishing. It is turning the investors away and leaving the playing field to short term traders who simply want to make trades based on momentum and nimbleness. This makes it increasingly difficult for juniors to raise capital. It is effectively severely damaging, if not destroying, the seedbed for the mining and resource sector.

Coming over the top is the other observation that increased activity of ETFs is sucking the money away from active management of portfolios, making fundamental analysis even more remote in the investment decision making process.

Surely the efficiency of markets - which are wonderful self sorting systems - will increase with the availability of more information, not less, with the caveat that it is not misinformation.

M & A becoming more aggressive in the gold sector

While I don't normally comment on what the big end of town is doing, a word on Saracen's \$1.1bn acquisition of 50% of Kalgoorlie's Super Pit is appropriate. Raleigh Finlayson has done an excellent job with Saracen since taking over the reins in 2013, particularly in the purchase of assets at the right time. Only time will tell whether this latest

acquisition is value-adding, or more of a corporate consolidation at higher gold production levels. The gold price will probably be the real arbiter, but if Raleigh is correct with his optimistic view of exploration potential, it may eventually be seen as an inspired purchase. The current 12 year mine life may be much longer.

We have previously commented that the Australian gold producers have been unusually prudent on the corporate front, having bought out North American-owned mines earlier in the cycle, at opportune prices. However, they have started to become more aggressive as their confidence has grown. We have even seen the Australian's go shopping in North America, which has at times in the past led to disasters for companies such as WMC and BHP. Shareholders and executives are not always aligned in their objectives. Shareholders want increasing value in their investments whereas management might be more concerned with ego and growth in status.

It would be fair to suggest that the Saracen share price could be entering a period of more subdued performance compared to where it has come from. The issue of \$796m worth of new stock, at \$2.95 a share, will certainly add to supply.

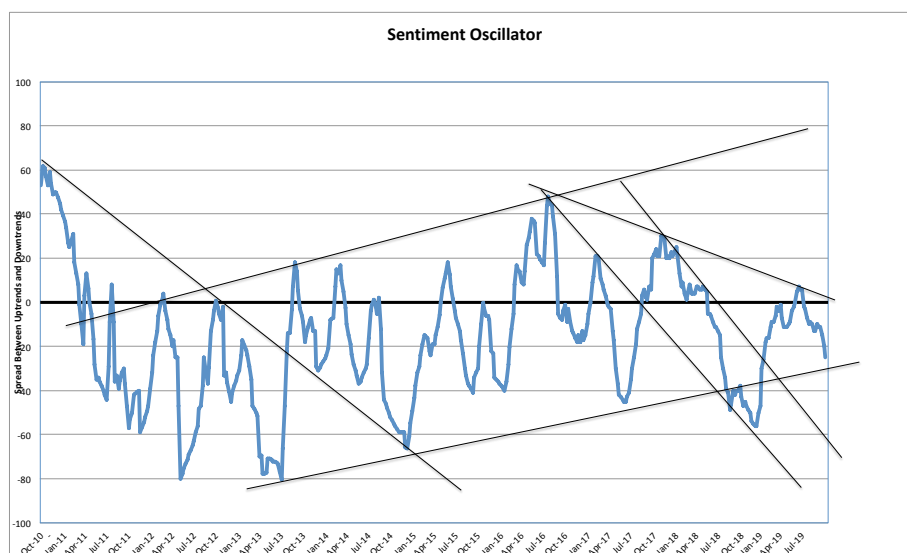
It is interesting that as recently as 11 November, in an ASX release, Saracen patted itself on the back for its "*highly successful organic growth strategy*". Well, we can relegate this self adulation to the basement. A \$1.1bn acquisition is hardly organic growth. Given that there will be a substantial increase in reserves attributable to Saracen, it will be interesting to see if there is an adjustment to the Performance Rights Remuneration calculations to allow for distinctions between organic ore reserve growth and ounces purchased.

Lucapa has been a major disappointment

Over the years I have often sung Lucapa's praises as it has been operationally the best diamond stock that I have seen for more than 30 years. However, the share price has been a major disappointment.

I was rung by a shareholder yesterday, who asked what was wrong. In reply I said that the operations were going well, but management is keeping it all a secret (other than releasing ASX reports). The big thing missing with this company is the personal interface with the investment community. The shareholder opined that if the share price does go higher, there will be stale bulls that will sell into any rally. I replied that it was worse than that. Long-term shareholders will be starting to exit the register because there is no point in being there, irrespective of diamond production. The opportunity cost of being loyal is just too great. The shares are at 12¢ seller with no floor in sight. Is someone happy to see them moribund, so a takeover will be easy to execute? Maybe. I suppose that would put us out of our misery.

Sentiment Oscillator: Sentiment weakened even further over the week. There were 25% (27%) of the charts in uptrend and 50% (47%) in downtrend on Friday's close.



Detailed Chart Comments

NB. Only the bold comments have been updated. Comments in grey type are from previous weeks and will be less relevant. Please note that this list is a cross section of the market. It IS NOT a list of recommendations.

Indices	Code	Trend Comment	
All Ordinaries	XAO	holding uptrend	
Metals and Mining	XMM	holding uptrend	
Energy	XEJ	holding uptrend	
Stocks	Code	Trend Comment (updated comments in bold)	Main Interest
Alpha HPA	A4N	resuming broad uptrend channel	HPA
Adriatic Resources	ADT	new high	zinc
Aeon Metals	AML	new low	copper + cobalt
Alacer Gold	AQG	new high	gold – production
Alkane Resources	ALK	testing support line	gold, zirconia
Acacia Resources	AJC	Sideways at the bottom	coal
Alicanto Minerals	AQI	new low	gold exploration
Allegiance Coal	AHQ	sideways on support	coal
Alliance Resources	AGS	testing uptrend	gold exploration
Apollo Consolidated	AOP	back to support line	gold exploration
Arafura Resources	ARU	breached downtrend	rare earths
Argent Minerals	ARD	down	silver
Aurelia Metals	AMI	testing downtrend	gold + base metals
Australian Potash	APC	testing uptrend	potash
Australian Mines	AUZ	continuing down	cobalt/nickel
Australian Vanadium	AVL	new low	vanadium
BHP	BHP	rising after downtrend breached	diversified, iron ore
Base Resources	BSE	down	mineral sands
Bathurst Resources	BRL	down	coal
BBX Minerals	BBX	sideways through downtrend line	gold exploration
Beach Energy	BPT	risen through resistance line	oil and gas

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Beacon Mining	BCN	down	gold production
Bellevue Gold	BGL	breached support, downtrend	gold exploration
Berkeley Energia	BKY	in secondary downtrend	uranium
Blackstone Minerals	BSX	testing downtrend	nickel
Bounty Coal	B2Y	still in downtrend	coal
Breaker Resources	BRB	down	gold exploration
Broken Hill Prospecting	BPL	steeply higher, then all the way back down	minerals sands
Buru Energy	BRU	turning down	oil
Buxton Resources	BUX	continuing down	nickel exploration
Capricorn Metals	CMM	consolidating 5 into 1	gold
Cardinal Resources	CDV	down	gold exploration
Cassini Resources	CZI	softer	nickel/Cu expl.
Central Petroleum	CTP	new uptrend	oil/gas
Chalice Gold	CHN	ST downtrend commencing	gold exploration
Chase Mining	CML	secondary downtrend	nickel/copper/PGE
Chesser Resources	CHZ	breached downtrend	gold exploration
Cobalt Blue	COB	breaching downtrend, but pullback	cobalt
Dacian Gold	DCN	turning down on LT resistance line	gold
Danakali	DNK	drifting lower	potash
Davenport Resources	DAV	broken lower	potash
Egan Street Resources	EGA	under takeover offer, but weaker	gold
Emerald Resource	EMR	gentle downtrend	gold
Evolution Mining	EVN	approaching support line in ST downtrend	gold
Exore Resources	ERX	higher for placement then slump	gold exploration
FAR	FAR	sideways at lows	oil/gas
First Graphene	FGR	short term down	graphene
Fortescue Metals	FMG	new high	iron ore
Galaxy Resources	GXY	new low	lithium
Galena Mining	G1A	slump	lead
Galilee Energy	GLL	downtrend forming	oil and gas, CBM
Gold Road	GOR	down	gold
Graphex Mining	GPX	drifting lower	graphite
Heron Resources	HRR	new low	zinc
Highfield Resources	HFR	down heavily	potash
Hillgrove Resources	HGO	sideways	copper
Iluka Resources	ILU	breached downtrend	mineral sands
Image Resources	IMA	slipped below support line	mineral sands
Independence Group	IGO	new high	gold, nickel
ioneer (was Global Geoscience)	INR	resting on support	lithium
Jervois Mining	JVR	sideways at lows	nickel/cobalt
Jindalee Resources	JRL	heavy fall	lithium
Karoo Gas	KAR	heading lower	gas
Kasbah Resources	KAS	new low	tin
Kibaran Resources	KNL	new low	graphite

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Kin Mining	KIN	■	down again	gold
Kingston Resources	KSN	■	down	gold
Legend Mining	LEG	■	stronger	nickel exploration
Lepidico	LPD	■	down	lithium
Lindian Resources	LIN	■	Uptrend	bauxite
Lithium Australia	LIT	■	new low	lithium
Lucapa Diamond	LOM	■	new low	diamonds
Lynas Corp.	LYC	■	down	rare earths
Mako Gold	MKG	■	rising off lows	gold exploration
Marmota	MEU	■	down	gold exploration
MetalsX	MLX	■	new low	tin, nickel
Metro Mining	MMI	■	sideways	bauxite
Mincor Resources	MCR	■	continuing higher	gold
Musgrave Minerals	MGV	■	correcting lower	gold exploration
Myanmar Minerals	MYL	■	new low	zinc
Nelson Resources	NES	■	breached uptrend	gold exploration
Neometals	NMT	■	continuing down	lithium
Northern Cobalt	N27	■	surge out of downtrend	cobalt
Northern Minerals	NTU	■	down	REE
Northern Star Res.	NST	■	down heavily	gold
NTM Gold	NTM	■	rising again	gold exploration
Oceana Gold	OGC	■	heavy fall	gold
Oklo Resources	OKU	■	stronger	gold expl.
Orecorp	ORR	■	rising again	gold development
Oro Verde	OVL	■	rising	rare earths
Orocobre	ORE	■	testing downtrend	lithium
Oz Minerals	OZL	■	surged higher in long-term uptrend	copper
Pacific American Holdings	PAK	■	at lows	coal
Pacifico Minerals	PMY	■	rising	silver/lead
Pantoro	PNR	■	down	gold
Panoramic Res	PAN	■	up - takeover bid	gold , nickel
Peak Resources	PEK	■	rising again	rare earths
Peel Mining	PEX	■	sideways	copper
Peninsula Energy	PEN	■	sideways	uranium
Pensana Metals	PM8	■	testing downtrend	rare earths
Perseus Mining	PRU	■	off its high	gold
Pilbara Minerals	PLS	■	down	lithium
PNX Metals	PNX	■	new uptrend forming	gold, silver, zinc
Polarex	PXX	■	breached uptrend	polymetallic exploration
Prodigy Gold	PRX	■	sideways	gold exploration
Ramelius Resources	RMS	■	heavy fall	gold production
Real Energy	RLE	■	new low	gas
Red5	RED	■	correcting lower	gold
Red River Resources	RVR	■	now in secondary downtrend	zinc

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Regis Resources	RRL		breached support	gold
Resolute Mining	RSG		down	gold
RIO	RIO		rising again	diversified, iron ore
Salt Lake Potash	SO4		breached uptrend	potash
Saracen Minerals	SAR		breached uptrend	gold
St Barbara	SBM		down	gold
Sandfire Resources	SFR		down	copper
Santos	STO		into uptrend	oil/gas
Saturn Metals	STN		uptrend breached	gold exploration
Sheffield Resources	SFX		down	mineral sands
St George Mining	SGQ		down	nickel
Sipa Resources	SRI		recovered, to sideways pattern	general exploration - Ni,Cu, Co, Au
Spectrum Metals	SPX		falling from highs	gold exploration
Stanmore Coal	SMR		down	coal
Strandline Resources	STA		breaching downtrend	mineral sands
Sundance Energy	SEA		heading lower	oil/gas
Syrah Resources	SYR		free fall on capital raising	graphite
Talga Resources	TLG		breached downtrend	graphite
Technology Metals	TMT		sideways	vanadium
Vango Mining	VAN		moving higher	gold
Venturex	VXR		new low on resignation of CEO	zinc
Vimy Resources	VMY		sideways under LT downtrend	uranium
West African Resources	WAF		improving	gold
Westgold Resources	WGX		breached uptrend	gold
Westwits	WWI		down	gold
Western Areas	WSA		surge out of downtrend	nickel
Whitebark Energy	WBE		rising	oil and gas
Whitehaven Coal	WHC		down	coal
Yandal Resources	YRL		breached ST uptrend	gold exploration
Zinc Mines of Ireland	ZMI		breached uptrend	zinc
Totals	25%	35	Uptrend	
	50%	69	Downtrend	
		139	Total	

Guides to Chart Interpretations

- Charts usually go pass from one trend (up or down) into the other via a period of indecision and uncertainty during which the trend can either recover or change. This period is signified by the orange colour. The orange represent both the greatest risk and greatest reward possibilities.
- Once a chart is in confirmed up or downtrends it is not uncommon for 10-20% of that trend to have already transpired.
- There are trends within trends. The focus of this chart review is the immediate trend that affects the sentiment i.e. it can be a downtrend within a long-term uptrend.
- Not every chart warrants a new comment every week. The new comments are in bold type. Grey type comments may be dated.
- Individual charts provide a single view. It is valuable to look at charts of other companies in similar commodities, and the overall sentiment is also very valuable. Not many stocks can swim against the tide.
- We periodically add or delete charts, some times for obscure reasons. If a chart consistent gives poor signals or is very erratic, we may delete it. Sometimes we add a chart because we want to see what all the fuss is about. We do have a preference for charting stocks that we cover in our research as well.
- Errors and omissions may occur from time to time, especially in fast moving markets.

Amber Lights in Tables: Just a reminder if when the amber light is used in the table – it is when the charts are ambiguous or when there is a change of trend taking place. If a chart is breaching a downtrend it can either be a positive sign or a trap. Only once it has done more work can it be confirmed as a new uptrend. Maybe it is a new uptrend (or conversely a new downtrend); the risk takers can decide to jump on board early (or sell). They will maximise their profits (or minimise their losses if indeed it is the start of the new uptrend (downtrend). More risk-averse investors should wait a little longer, being prepared to give up some of the gains in return for greater certainty.

Weightings of Sectors Represented in the Company Charts			
Sector	No. of Companies	Weighting	
Gold	30	21.6%	
Gold Exploration	20	14.4%	
Oil/Gas	10	7.2%	
Nickel	8	5.8%	
Lithium	8	5.8%	
Coal	7	5.0%	
Zinc/Lead	10	7.2%	
Mineral Sands	6	4.3%	
Rare Earths	6	4.3%	
Potash/Phosphate	5	3.6%	
Copper	5	3.6%	
Cobalt	3	2.2%	
Graphite	4	2.9%	
Tin	2	1.4%	
Iron Ore	3	2.2%	
Uranium	2	1.4%	
Bauxite	3	2.2%	
Vanadium	2	1.4%	
Silver	2	1.4%	
Diamonds	1	0.7%	
Other	2		
Total	139		

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