

## First Graphene opens up new growth curves

The Australian ran an article last week stating that the Chinese had been buying gold aggressively. It was common knowledge that the Chinese Government has been buying gold but the news that the general population has also been buying adds more substance to the gold bull market thematic. As the economic future of China becomes more opaque, and with its political stability, it is not surprising that people want something they can hide from the Chinese Communist Party. Gold hit a new high of US\$2,233/oz last week. Everything points to it continuing to rise. We repeat the advice we have been giving for the last six months; you should be moving money into the gold sector.

### *FGR making great breakthroughs*

First Graphene has recently made a couple of ASX releases regarding significant progress on the graphene front. The first one concerned the production of graphene oxide, the second one detailed progress with the development of an electrocatalyst for the production of hydrogen.

### *GO opens up new commercial opportunities*

FGR has specialised in the production of graphene powder (nano-flakes) that can be added to many materials to improve a range of performance parameters. The most notable one to date has been the addition to cement to reduce greenhouse gas emissions. Up until now it has not done much in the graphene oxide (GO) space but continued R&D has shown that its manufacturing facility at Henderson is capable of producing this material, which is useful for a whole range of applications new to the Company.

Graphene oxide (GO) is similar to graphene but has a high oxygen content which makes it readily dispersible in water. The material is strong, flexible and porous with a high surface area, which is suitable for filtration and supercapacitor applications. It is hydrophilic rather than hydrophobic.

First Graphene's product will meet the needs of various industries, with strong demand already identified in water purification and desalination processes. The Company is currently in discussions with customers in these markets.

Graphene oxide's characteristics make it suitable for use in polar thermoplastic polymers, such as PVC, polyesters and nylon, as well as aqueous coatings. The graphene oxide market presents a significant opportunity for the Company, poised to reach USD\$2.7 billion by 2030.

FGR had already reached the status of the leading graphene company in the world, achieving greater technical and commercial success than its competitors. The GO development will further strengthen its position and make it more able to meet the requirements of customers across a wider range of applications. To be able to enter

this market using the existing production facility is a significant achievement.

### *Electrocatalyst a game change on hydrogen costs*

The hydrogen bubble we saw a year or two ago has deflated, if not popped. For all the hype at the time it was obvious that industry needed to make further technical breakthroughs before being commercially viable for the big picture.

One of the areas that needed improvement was the performance of electrocatalysts, necessary to reduce energy requirements in making hydrogen when splitting water by electrolysis. The electrocatalysts are essential for the economic production of 'green hydrogen'.

Current state-of-the-art electrocatalysts use high-cost rare metals such as iridium and ruthenium. However, test work has shown that FGR's electrocatalyst solution performs remarkably well compared to a commercial ruthenium catalyst, resulting in close to three-times the output in hydrogen production while using the same quantity of ruthenium.

FGR's research has been funded by a \$183,000 grant from Innovate UK. An additional \$155,000 has been provided by The Centre of Expertise in Advanced Materials Sustainability in the UK. This will fund the next step to define process parameters in pilot-scale production of graphene catalyst materials, which is a necessary step towards full-scale production and partnerships with end users.

Electrolyser manufacturing capacity is expected to grow globally from 19 gigawatts per year to 155 gigawatts per year by 2030. From this, a projected 35 gigawatts per year is expected to be in the form of Proton Exchange Membrane (PEM) electrolysers. As First Graphene's enhanced electrocatalysts are well suited for hydrogen synthesis in a PEM electrolyser, this could be the start of a new growth profile for the Company. It is all very positive with a number of growth curves opening up.

### *The Bottom Line*

The commercialisation of any new technology takes time, and therefore patience. Graphene is no exception to this observation, but shareholders in FGR can be confident that they own a piece of the world's leading graphene company. FGR is progressing with the qualification trials to have PureGraph added to cement, to reduce carbon emissions of that sector by 10-15% and unlock the door to a very profitable business. Simultaneously it continues to make technical progress on a number of fronts such as the two mentioned above.

*Disclosure: Interests associated with the author owns shares in First Graphene. and is non-executive chairman.*

### *Hastings story is getting darker*

Hastings Technology Metals (HAS), one of the early darlings of the rare earths boom, plunged to new lows last week with the news of a partially underwritten by Canaccord for a 9 for 20 entitlement issue to shareholders at 36¢ a share (with 1 for attached options).

In theory an entitlement is not dilutionary, but that is only true if shareholders take up the entitlement. If they have averaged down or have fully participated in prior issues, the likelihood is that they either don't have any free funds, or they are scared of throwing good money after bad.

At one point HAS looked reasonably well-funded with the support of some major organisations, and a large market capitalisation, but cost blow-outs and the collapse of rare earth prices has pulled the rug out from under it. Will the story deteriorate further? Time will tell, but recent performance won't assist the sentiment towards rare earth companies generally. It continues to be a bloodbath.

### *Andean acceptances up to 77%*

At the beginning of the week the takeover bid of Andean Minerals by Agua Resources had achieved 77% acceptance levels and it is probably above 80% with more acceptances flowing in. Andean is an unlisted company with approximately 100 shareholders. It has the very high grade Santa Barbara gold mine in Colombia that completed a successful pilot scale operation, mining and processing 500 tonnes of underground ore to achieve an average recovered grade of around 20 gpt. The associated silver content was not recorded by the previous owners.

Having determined important parameters such as the geometry of the orebodies, underground mining conditions and metallurgical recovery, the pilot program was very successful. Now that Andean has acquired the project in mid 2022, it is progressing with a restart at the expanded capacity of 50 tpd in Q4 of 2024. That could enable production of 10-12,000 oz p.a. in the first instance, which is small, but so will be the capex required for the restart. Andean advised that it could be achieved at less than A\$2m. The expected very low cash operating costs of around US\$300/oz ensures that cash flow will be strong at up to \$2m per month.

The economics of Santa Barbara look very impressive and that is why Agua has launched the bid; low capex, low operating costs and rapid path to cashflow. There is a bigger picture though. There is considerable blue sky appeal owing to 7 km of mapped veins that haven't been drilled yet. Once the drill rig begins turning there could be a quick path to JORC resources with the confidence that we already know the orebodies are readily mineable.

The role model for Santa Barbara is the Buritica Gold Mine, nearby in Colombia. About 10 years ago Buritica was in the same position as Santa Barbara is today - similar geology with a small 30 tpd pilot plant but no JORC resources. When Continental started drilling it quickly built up a resource to achieve 7-8 Moz of gold. It started a 250,000 oz p.a. gold mine before Jijin bought Continental's 65% interest for C\$1.4bn. That should be the ultimate aim for Agua/Andean - capital gain for shareholders upon the confirmation of a substantial gold resource. We believe it is definitely a possibility.

### *The Bottom Line*

Agua looks likely to will be a real winner as it closes in on Andean. Gold is the best place to be as it breaks to new highs, so the takeover bid was perfectly timed. But wait, there is more. The organic phosphate projects in Brazil, long overlooked by the market, looks like they could make Agua a cashflow powerhouse within 12-18 months. Thus, Agua shareholders will have two potential ten baggers in its portfolio without the need to raise large amounts of capital due to the ability to grow through positive cashflow.

*Disclosure: Interests associated with the author owns shares in Agua Resources and Andean Mining. He is chairman of both companies and has received payment for capital raisings.*

### *The problem with being a director*

Last week I castigated unspecified directors for taking too much money out of junior companies. This week I'll make a few comments from the directors' point of view.

One of the biggest problems in being a director of an ASX company, at least for me, is that it is very difficult to benefit from share price movements. It is difficult to find time when you don't have inside information that would prohibit on-market purchases. You are not allowed to invest money in the company by participating in a placement, without shareholder approval. Once you become a director, it is almost impossible to sell shares ... unless you resign.

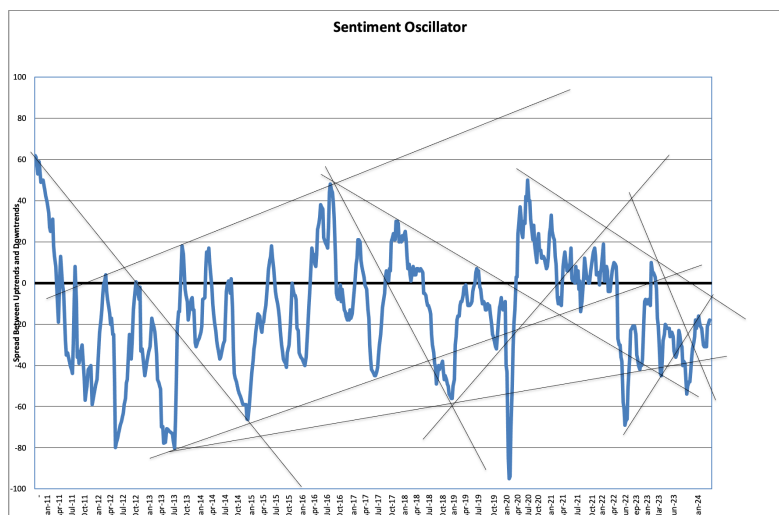
Shareholders like their directors to have "skin in the game", - fair enough - but once they do, their funds become captive. We should remember that there are things that affect share price performance beyond the influence of directors. Many junior companies have share prices tossed around like corks on the ocean in a sea of changing market sentiment. Directors are not responsible for the macro environment in what we call equity markets, but they do have to deal with it as best they can.

There is one company that I'm on the board of that I would love to be buying, but anything I put in it becomes immediately frozen. That is never good when managing an investment portfolio.

I would like to take advantage of the depressed stock market, show some confidence in the company's future and show some leadership by stepping up to the plate and buying shares, but I don't want to be trapped. It unfair that shareholders can come and go as they please, but directors can't. The rules are too restrictive in the way they discriminate against directors. It is difficult to make money when you are in a straight jacket.

### *Additions and delations to the charts*

There is no point in charting a stock that is in a long term suspension, as it can't give any signals. So, we have deleted Galina, Genmin, Strandline and Xantippe. Maybe we can resume coverage if and when they return from suspension. We have added gold company Catalyst Metals (CYL) and Walkabout Resources (WKT) as it is commissioning a graphite mine. We did think about adding Dave Flanagan's new iron ore vehicle, Arrow Minerals, but with 9.5 billion shares on issue and a share price of 0.5¢, it is hard to make sense of any charting signals.



**Sentiment Oscillator:** Sentiment improved a little. There were 27% (28%) of stocks in uptrend and 45% (48%) in downtrend at the close of the week.

### 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	a new high	
Metals and Mining	XMM	testing downtrend	
Energy	XEJ	rallying	
Information Technology	XIJ	peaking?	
Stocks	Code	Trend Comment (updated comments in bold)	Main Interest
5EA Advanced Materials	5EA	spiked through downtrend	boron
92 Energy	92E	trying to hold trend line	uranium
Adriatic Resources	ADT	new high	zinc, polymetallic
Advance Metals (was Pacific American)	AVM	back to lows	coal, gold exploration
Aguia Resources	AGR	breached LT downtrend	phosphate, copper exploration
Alkane Resources	ALK	down	gold
Alicanto Minerals	AQI	fallen back to lows	base metals, silver, gold
Alligator Energy	AGE	breached uptrend	uranium
Almonty Industries	All	testing uptrend	tungsten
Alpha HPA	A4N	wedge forming	HPA
Altech Chemical	ATC	breaching downtrend	HPA, anodes
Alto Metals	AME	rallying	gold exploration
American Rare Earths	ARR	continuing to fall	rare earths
Anax Metals	ANX	sideways through downtrend, at lows	copper
Anteotech	ADO	breached downtrend	silicon anodes, biotech
Arafura Resources	ARU	pullback	rare earths

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Ardea Resources	ARL		breaching downtrend	nickel
Arizona Lithium	AZL		strong rally	lithium
Astral Resources	AAR		gentle downtrend	gold
Averina	AEV		suspended	phosphate
Aurora Energy Metals	1AE		back to trend line	uranium
Aurelia Metals	AMI		rising	gold + base metals
Australian Rare Earths	AR3		at lows	rare earths
Australian Strategic Materials	ASM		strong rally but hit LT resistance line	rare earths
Azure Minerals	AZS		another surge higher then pullback	nickel exploration
BHP	BHP		down	diversified, iron ore
Barton Gold	BGD		sideways through support line	gold exploration
Beach Energy	BPT		rising gently	oil and gas
Bellevue Gold	BGL		new high	gold exploration
Besra Gold	BEZ		testing support line	gold
Black Cat Syndicate	BC8		steep rally	gold
BMG Resources	BMG		down	gold exploration
Boab Metals	BML		heavy fall	silver/lead
Cadoux (was FYI)	CCM		testing steepest downtrend	HPA
Calidus Resources	CAI		down to new low on placement	gold
Caravel Minerals	CVV		strong rally	copper
Carnaby Resources	CNB		secondary downtrend	copper
Castile Resources	CST		breaking uptrend	gold/copper/cobalt
Catalyst Metals	CYL		new uptrend	
Cazaly Resources	CAZ		back to downtrend	rare earths
Celsius Resources	CLA		stronger	copper
Cobalt Blue	COB		down again	cobalt
Cyprium Metals	CYM		testing downtrend	copper
Ecograp	EGR		testing support line	graphite
Emerald Resources	EMR		rising, new high	gold
Empire Energy	EEG		breached support	gas
EQ Resources	EQR		breaching downtrend	tungsten
Euro Manganese	EMN		testing downtrend	manganese
Evolution Energy	EV1		new low	graphite
Evolution Mining	EVN		crashed lower	gold
First Graphene	FGR		new high	graphene
Fortescue Metals	FMG		off its high	iron ore
Genesis Minerals	GMD		testing uptrend	gold
Gold 50	G50		down again	gold exploration + gallium
Great Boulder Resources	GBR		new low	gold exploration
Group 6 Metals	G6M		down	tungsten
Hamelin Gold	HMG		new low	gold exploration
Hastings Technology Metals	HAS		collapse to new low	rare earths
Hazer Group	HZR		testing downtrend	hydrogen
Heavy Minerals	HVY		new low	garnet

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Hillgrove Resources	HGO		rising gently	copper
Iluka Resources	ILU		heavy fall	mineral sands
ioneer (was Global Geoscience)	INR		new low	lithium
Ionic Rare Earths	IXR		breached downtrend	rare earths
Jervois Mining	JVR		new low	nickel/cobalt
Jindalee Lithium	JLL		back to lows	lithium
Kaiser Reef	KAU		improving	gold
Krakatoa Resources	KTA		new low	rare earths
Kingfisher Mining	KFM		breached downtrend	rare earths
Lepidico	LPD		new low	lithium
Lindian Resources	LIN		new low	rare earths + bauxite
Lion One Metals	LLO		heavy fall - suspension	gold
Li-S Energy	LIS		new low	Lithium sulphur battery technology
LCL Resources	LCL		new low	gold exploration
Lotus Resources	LOT		rising	uranium
Lucapa Diamond	LOM		sideways	diamonds
Lunnon Metals	LM8		new low	nickel
Lynas Corp.	LYC		still down	rare earths
Marmota	MEU		rising	gold exploration
Mayur Resources	MRL		breached uptrend	renewables, cement
Meeka Gold	MEK		down	gold
MetalsX	MLX		down	tin, nickel
Meteoric Resources	MEI		breaching downtrend	rare earths
Metro Mining	MMI		new high	bauxite
Midas Minerals	MM1		slump	lithium
Nagambie Resources	NAG		collapse to a new low	gold, antimony
Neometals	NMT		new low	lithium
Newfield Resources	NWF		down	diamonds
Nexgen Energy	NXG		rising	uranium
Northern Star Res.	NST		rising	gold
Nova Minerals	NVA		off its highs	gold exploration
Pacific Gold	PGO		new low	gold exploration
Paladin Energy	PDN		new high	uranium
Pantoro	PNR		rising again	gold
Patriot Battery Metals	PMT		testing downtrend	lithium
Peak Resources	PEK		new low	rare earths
Peninsula Energy	PEN		breached downtrend	uranium
Perseus Mining	PRU		testing support line	gold
Poseidon Nickel	POS		new low	nickel
Provaris Energy	PV1		down	hydrogen
QMiners	QML		new low	copper
Queensland Pacific Metals	QPM		new low	nickel/cobalt/HPA
RareX	REE		new low	rare earths, phosphate
Regis Resources	RRL		turned down again	gold

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Regergen	RLT	<span style="color: red;">■</span>	down	gas, helium
Richmond Vanadium	RVT	<span style="color: green;">■</span>	rising	vanadium
RIO	RIO	<span style="color: green;">■</span>	off its highs	diversified, iron ore
Rumble Resources	RTR	<span style="color: red;">■</span>	new low	gold exploration
S2 Resources	S2R	<span style="color: red;">■</span>	down	gold exploration
Sandfire Resources	SFR	<span style="color: green;">■</span>	rising again	copper
Santos	STO	<span style="color: orange;">■</span>	weaker	oil/gas
Sarama Resources	SRR	<span style="color: orange;">■</span>	<b>strong rally</b>	gold exploration
Sarytogan Graphite	SGA	<span style="color: green;">■</span>	rising off lows	graphite
Siren Gold	SNG	<span style="color: red;">■</span>	bounced from lows	gold exploration
South Harz Potash	SHP	<span style="color: red;">■</span>	new low	potash
Southern Cross Gold	SXG	<span style="color: green;">■</span>	spike to new high	gold exploration
Southern Palladium	SPD	<span style="color: orange;">■</span>	testing downtrend	PGMs
Stanmore Coal	SMR	<span style="color: orange;">■</span>	testing uptrend	coal
Sunstone Metals	STM	<span style="color: orange;">■</span>	<b>breaching downtrend line</b>	gold/copper exploration
Suvo Strategic Minerals	SUV	<span style="color: green;">■</span>	rising	kaolin
Talga Resources	TLG	<span style="color: red;">■</span>	rallying	graphite
Tamboran Resources	TBN	<span style="color: green;">■</span>	rising again	gas
Technology Metals	TMT	<span style="color: red;">■</span>	down	vanadium
Theta Gold Mines	TGM	<span style="color: green;">■</span>	rising again	gold
Thor Energy	THR	<span style="color: green;">■</span>	new uptrend	uranium
Tietto Minerals	TIE	<span style="color: green;">■</span>	surge on takeover approach	gold
Vanadium Resources	VR8	<span style="color: red;">■</span>	drifting lower	vanadium
Venture Minerals	VMS	<span style="color: orange;">■</span>	breached uptrend	tin, tungsten
Vintage Energy	VEN	<span style="color: red;">■</span>	new low	gas
Voltaic Strategic Resources	VSR	<span style="color: red;">■</span>	new low	REO + lithium
Walkabout Resources	WKT	<span style="color: orange;">■</span>	sideways	
West Cobar	WC1	<span style="color: red;">■</span>	new low	rare earth + lithium
Westgold Resources	WGX	<span style="color: green;">■</span>	new high	gold
West Wits Mining	WWI	<span style="color: orange;">■</span>	sideways	gold
Whitehaven Coal	WHC	<span style="color: orange;">■</span>	testing uptrend	coal
Zenith Minerals	ZNC	<span style="color: red;">■</span>	new low	gold exploration
Totals	27%	36	Uptrend	
	45%	61	Downtrend	
		135	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.

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- 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 Exploration	18	13.3%	
Gold	19	14.1%	
Rare Earths	14	10.4%	
Lithium	9	6.7%	
Copper	9	6.7%	
Uranium	9	6.7%	
Oil/Gas	8	5.9%	
Nickel	6	4.4%	
Iron Ore/Manganese	4	3.0%	
Graphite/graphene	6	4.4%	
Silver	4	44.4%	
Tungsten	3	2.2%	
Mineral Sands	1	0.7%	
Vanadium	3	33.3%	
Zinc/Lead	1	0.7%	
Coal	2	1.5%	
Potash/Phosphate	3	2.2%	
Bauxite	2	1.5%	
Tin	2	1.5%	
Cobalt	1	0.7%	
Diamonds	2	1.5%	
Other	9		
Total	135		

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