

Pacific American Coal buys into graphene commercialisation business

Short week with the Easter slow down

It is common for investors to be looking for excuses to disengage from markets and avoid having to make decisions, especially when times are tougher. That is exactly what we have had this week in the lead up to Easter. Tidy the desk and forget the markets for a few days.

We had the good run from mid February until mid March. It was great to be making money again, but it was half over before anyone realised what was happening. The run was so strong that it was always going to lead to profit taking and with Easter approaching the markets slowed. It remains to be seen where we go when we come back next week, but I would be expecting another slow week if there aren't any intervening events.

Our charts have only been updated to the close of business as of Wednesday night, but since then the gold price was crunched in New York in an off-night for commodity prices. Interest rate uncertainty is having an influence.

Pacific American buying into graphene business ...

Last Monday this little coal company, with 250 Mt of coking coal (*JORC MIII*) in British Columbia, decided to embrace the advanced end of the carbon sector. It announced a deal whereby it will take an initial 20% interest in the private graphene commercialisation specialist, Imagine Intelligent Materials Pty Ltd (*Imagine IM*). That stake can be increased to 40% through a share exchange, making Pacific American Coal (PAK) the largest shareholder. The first 20% stake will be achieved by taking a \$1.25m placement in Imagine IM.

... graphene producers need to find buyers

We all know that graphene is the new wonder material. We know that companies such as First Graphite (FGR) and Talga (TLG) have access to orebodies that can employ electrochemical exfoliation processes to produce bulk graphene at a fraction of the cost of chemical vapour deposition (CVD) and other methods. However, we must remember that graphene is an industrial material and there is no open market as yet. That means a prospective producer of graphene has to be out there finding buyers and they have to be able to shift volume to justify the development of mines designed to specialise in graphene. It's a chicken and egg dilemma. This is where **Imagine IM** steps in.

... Imagine IM is about commercialising technology

Imagine IM was set up two years ago with the specific objective of taking graphene technology from the laboratory to the commercial world. Its aim is to functionalise graphene and develop master batch materials that enable delivery of graphene's qualities (of superior conductivity, strength, flexibility to name just a

few) into existing manufacturing processes. Imagine IM's revenue model is based on developing proprietary solutions that are licensed to end users, and then collecting royalties from the entire supply chain of companies that are involved in the manufacturing processes.

... quality assurance and standards regime

Imagine is agnostic as to where the input graphene material comes from provided it is fit for purpose and meets the precise specifications that are required to meet the solution. That leads to a critical component of the enterprise - characterisation and certification. One of the problems with buying graphene today is the lack of quality control and standards. I have had companies complain that what they order is often not what they receive. In some cases it is not even graphene but graphite. Everyone knows that this is a problem but no-one is doing anything about it - until now.

Imagine IM is responsible for delivering replicable functionality, at scale, to its customers. It has a strong interest in developing a comprehensive but highly focused standardisation regime delivered via measurement and use of trademarks. Members of the supply chain will be able to rely on its certification to gain confidence, and to know that the product that contains graphene are fit for purpose. It is self-re-enforcing.

... in-house graphene production capability

Notwithstanding Imagine's intention to source graphene from third party suppliers, it will still have the capability of producing its own graphene from a plant to be built in Geelong (*see attached pass clipping*). The initial capacity is 10 tonnes p.a. using graphite as the initial feedstock. This plant will initially be used to deliver functionalised graphene for known applications and existing Australian customers.

... first commercial product launch

Imagine IM proposes to launch its first commercial product in April, being a graphene coating aimed at the US\$16bn global geosynthetic industry. The conductivity of graphene will enable inexpensive leak detection capabilities to be realised at the point of installation. Conductivity leads to more downstream functions being possible.

The most obvious use of geotextiles to a person familiar with mining is the lining of tailings dams and land fills, but the market is much larger than this. Managing the impact of water in construction, roads and foundations is a continuing problem in infrastructure building. Graphene enhanced geotextiles have the potential to enable internet of things capabilities in every aspect of building and will enable real time monitoring of stress, heat, moisture and more.

The coking coal is still a sleeping asset in PAK

I have previously said that the 250 Mt of coking coal in will one day be valued by the market at 10¢ per tonne, in situ. At the moment the market is only giving it 1¢ per tonne. Some

time within one to five years we will see much better recognition. In the meantime it is a sleeping asset.

The Imagine IM transaction will be subject to shareholder approval and PAK will need to do a small placement to fund the initiative, but that shouldn't be difficult given the exciting new future which is unfolding. *Disclosure: Interests associated with the author own shares in PAK and Imagine IM and will benefit from the the proposed transaction and receive industry standard fees.*

Graphite Conference in Perth

During the week I attended the Australian Graphite Conference in Perth at which about a dozen graphite hopefuls presented their merits. The presenters were almost exclusively flake graphite companies, mostly competing for the same markets. We heard all of the usual hyperbole. Its amazing how many were fast-tracking their projects and how many of these had entered the space as recently as 2015. Some even denied that there was going to be an oversupply.

There was only one vein graphite company at the conference; First Graphite Resources (FGR). Unlike all the other companies it is actually developing its mines now. These are small underground mines in Sri Lanka that will produce amazingly rich run-of-mine ore that

require almost no processing. That means minimal capital expenditure and basically no metallurgical risk. There is no impending problem with oversupply, but there is something even more compelling. It can convert that run-of-mine ore to high quality graphene at amazing yields and at a fraction of the cost of any other graphene producer.

Regular readers will know of my support for Talga over the past two years for similar reasons, but First Graphite actually looks like a much better, lower risk operator due to yields being about 10x those reported by Talga. That means much less capex for the same production capacity. It means almost no waste products. First Graphite started its testing 12 months after Talga but it has already caught up, spending much less money in the process.

It should not surprise you to learn that First Graphite has a Heads of Agreement with Imagine IM to participate in the downstream commercialisation of graphene produced from its vein graphite. It is thinking ahead, not content with just mining and selling ultra-high grade graphite. Its preparing to unlock the full value chain. The plot thickens. *Disclosure: Interests associated with the author own shares in FGR and the author is a director.*

Sentiment Indicator: In the three days of chart coverage we saw both the bulls and bears moderate in weight, suggesting lower conviction of sentiment either way. This isn't surprising when investors decide to sit on the fence. There were 39% (41%) of the stocks in uptrend and 25% (27%) in downtrend.

Detailed Chart Comments



NB. Only the bold comments have been updated. Comments in grey type are from previous weeks and will be less relevant.

Indices	Code	Trend Comment	
All Ordinaries	XAO	above resistance line	
Metals and Mining	XMM	halting at resistance line	
Energy	XEJ	halting at resistance line	
Stocks	Code	Trend Comment (updated comments in bold)	Main Interest
ABM Resources	ABU	stopped by resistance	gold
Aeon Metals	AML	vertical rise	copper + cobalt
Alacer Gold	AQG	correcting lower	gold – production
Alkane Resources	ALK	continuing down	gold, zirconia
Acacia Resources	AJC	Sideways at the bottom	coal
African Energy	AFR	still in downtrend	coal
Aguia Resources	AGR	downtrend	phosphate
Alicanto Minerals	AQI	steep rise	gold exploration
Altech Chemicals	ATC	breached secondary downtrend	industrial minerals
Anova Metals	AWV	uptrend, consolidating	gold
Antipa Minerals	AZY	breached downtrend	gold
Archer Exploration	AXE	drifting	graphite
Argent Minerals	ARD	sideways	polymetallic
Atlas Iron	AGO	retracing rise	iron ore
Atrum Coal	ATU	breached downtrend	coal
Australian Bauxite	ABX	New low	bauxite
Avanco Resources	AVB	ST uptrend	copper
AWE	AWE	ST uptrend	oil and gas
BHP	BHP	still undecided	diversified
Base Resources	BSE	steep rise from lows	mineral sands
Beach Energy	BPT	testing downtrend	oil and gas

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Beadell Resources	BDR		strong rise	gold
Berkeley Resources	BKY		correcting downwards	uranium
Blackham Resources	BLK		steeply higher	gold
Broken Hill Prospect.	BPL		down	minerals sands, cobalt
Buru Energy	BRU		sideways at lows	oil
Canyon Resources	CAY		rising	bauxite
Cardinal Resources	CDV		moving higher?	gold exploration
Carnegie Wave	CWE		breached downtrend	wave energy
Cassini Resources	CZI		new uptrend	nickel/Cu expl.
Chalice Gold	CHN		testing uptrend	gold
Consolidated Tin	CSD		heavy slump	tin
Consolidated Zinc	CZL		secondary downtrend	zinc
Coventary Resources	CYY		breached downtrend	copper
Dacian Gold	DCN		uptrend	gold exploration
Danakiali	DNK		sideways	potash
Doray Minerals	DRM		new high	gold
Duketon Mining	DKM		testing short term uptrend	nickel
Eden Energy	EDE		strong breakout upside	carbon nanotubes in concrete
Energia Minerals	EMX		strong breach of downtrend	zinc
Energy Resources	ERA		breached downtrend	uranium
Evolution Mining	EVN		back to support line	gold
Excelsior Gold	EXG		rolling over, short term down	gold
First Australian	FAR		breached downtrend	oil/gas
First Graphite	FGR		just testing resistance line	graphite
Fortescue Metals	FMG		huge rise then correction	iron ore
Galaxy Resources	GXY		new high	lithium
Galilee Energy	GXY		surged higher	oil and gas, CBM
Gascoyne Resources	GCY		uptrend	gold
General Mining	GMM		new high	lithium
Geopacific Res. Resources	GPR		new uptrend	copper/gold exp.
Gold Road	GOR		uptrend	gold exploration
Goldphyre	GPH		back to support line	potash, gold
Gryphon Minerals	GRY		higher	gold
Herron Resources	HRR		sideways	zinc
Highfield Resources	HFR		heavy fall	potash
Highlands Pacific	HIG		testing downtrend	copper, nickel
Hillgrove Resources	HGO		working through downtrend line	copper
Hot Chilli	HCH		new low	copper
Iluka Resources	ILU		testing uptrend	mineral sands
Independence	IGO		steep rise	gold, nickel
Intrepid Mines	IAU		sideways	copper
IMX Resources	IXR		testing downtrend	graphite
Karoo Gas	KAR		at lows	gas
Kasbah Resources	KAS		sideways through trendline	tin
KBL Mining	KBL		collapse back to lows	copper/gold/zinc
Kibaran Resources	KNL		breaching support	graphite
Kin Mining	KIN		at lows	gold
King Island Scheel.	KIS		New low	tungsten
Kingsgate Consol.	KCN		secondary downtrend	gold
Kingsrose Mining	KRM		at resistance	gold
Legend Mining	LEG		breached downtrend	exploration
Lithium Australia	LIT		correcting lower	lithium
Lucapa Diamond	LOM		breached trendline	diamonds
Macphersons Res.	MRP		uptrend	silver
Medusa Mining	MML		slump to trendline	gold
Metals of Africa	MTA		surged higher, but at resistance line	zinc expl/graph.
MetalsX	MLX		breached downtrend	tin, gold
Mincor Resources	MCR		testing resistance line	nickel
MMJ PhytoTech	MMJ		uptrend breached	medical cannabis

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Mount Gibson	MGX		sideways	iron ore
Mustang Resources	MUS		heavy fall	diamonds, rubies
MZI Resources	MZI		new low	mineral sands
Newfield Resources	NWF		collapse on tiny volume	diamonds
Northern Minerals	NTU		new low	REE
Northern Star Res.	NST		looks like a short term top	gold
Oceana Gold	OGC		looks like a short term top	gold
Oklo Resources	OKU		breached downtrend	gold expl.
OM Holdings	OMH		New low	manganese
Orecorp	ORR		new high	gold development
Orinoco Gold	OGX		short term down	gold development
Orocobre	ORE		through resistance and higher	lithium
Oz Minerals	OZL		testing uptrend	copper
Paladin Energy	PDN		breaching downtrend	uranium
Pacific American Coal	PAK		strong rise	coal
Pantorro	PNR		rising	gold
Panoramic Res	PAN		short term rising	nickel
Panterra Gold	PGI		new uptrend	gold production
Paringa Resources	PNL		breaching downtrend	coal
Peel Mining	PEX		down	copper
Peninsula Energy	PEN		testing downtrend	uranium
Perseus Mining	PRU		rising again	gold
Pilbara Minerals	PLS		sideways	lithium/tantalum
Platina Resources	PGM		breached downtrend	PGMs, gold
Potash West	PWN		down	potash
Red River Resources	RVR		breached uptrend	zinc
Regal Resources	RER		rising from lows	copper
Regis Resources	RRL		looks like a short term top	gold
Renaissance Min.	RNS		short term higher, with pullback	gold
Resolute Mining	RSG		breached steep uptrend	gold
Reward Minerals	RWD		down	potash
Rex Minerals	RXM		surge through downtrend	copper
RIO	RIO		steep ST uptrend	diversified
RTG Mining	RTG		strongly higher	copper/gold
Rum Jungle	RUM		turned down at resistance line	quartz
Salt Lake Potash	SO4		uptrend	potash
Saracen Minerals	SAR		new high	gold
St Barbara	SBM		new high	gold
Sandfire Resources	SFR		correcting lower	copper
Santana Minerals	SMI		breached downtrend	silver
Santos	STO		new uptrend	oil/gas
Sheffield Resources	SFX		testing downtrend	mineral sands
Silver City Minerals	SCI		heavy fall	base metals
Silver Lake Resources	SLR		testing new uptrend	gold
Sino Gas & Energy	SEH		new uptrend	gas
Southern Gold	SAU		uptrend, but correcting pattern	gold
Sthn Hemisphere	SUH		down	copper
Stavely Minerals	SVY		breached downtrend	copper exploration
Sunbird Energy	SNY		New low	gas/CBM
Sundance Energy	SEA		surge higher	oil/gas
Syrah Resources	SYR		uptrend	graphite
Talga Resources	TLG		sideways through downtrend	graphene
Tanami Gold	TAM		down	gold
Tiger Resources	TGS		strong rise to secondary resistance	copper
TNG Resources	TGS		breaching ST uptrend	titanium, vanadium
Torian Resources	TNR		downtrend	gold expl'n
Toro Energy	TOE		downtrend	uranium
Troy Resources	TRY		uptrend	gold
UraniumSA	USA		Secondary downtrend	uranium

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Resolute Mining	RSG		breached steep uptrend	gold
Reward Minerals	RWD		down	potash
Rex Minerals	RXM		surge through downtrend	copper
RIO	RIO		steep ST uptrend	diversified
RTG Mining	RTG		strongly higher	copper/gold
Rum Jungle	RUM		turned down at resistance line	quartz
Salt Lake Potash	SO4		uptrend	potash
Saracen Minerals	SAR		new high	gold
St Barbara	SBM		new high	gold
Sandfire Resources	SFR		correcting lower	copper
Santana Minerals	SMI		breached downtrend	silver
Santos	STO		new uptrend	oil/gas
Sheffield Resources	SFX		testing downtrend	mineral sands
Silver City Minerals	SCI		heavy fall	base metals
Silver Lake Resources	SLR		testing new uptrend	gold
Sino Gas & Energy	SEH		new uptrend	gas
Southern Gold	SAU		uptrend, but correcting pattern	gold
Sthn Hemisphere	SUH		down	copper
Stavely Minerals	SVY		breached downtrend	copper exploration
Sunbird Energy	SNY		New low	gas/CBM
Sundance Energy	SEA		surge higher	oil/gas
Syrah Resources	SYR		uptrend	graphite
Talga Resources	TLG		sideways through downtrend	graphene
Tanami Gold	TAM		down	gold
Tiger Resources	TGS		strong rise to secondary resistance	copper
TNG Resources	TGS		breaching ST uptrend	titanium, vanadium
Torian Resources	TNR		downtrend	gold expl'n
Toro Energy	TOE		downtrend	uranium
Troy Resources	TRY		uptrend	gold
UraniumSA	USA		Secondary downtrend	uranium
URI	URI		downtrend	uranium
Vimy Resources	VMY		back to downtrend	uranium
West African Resources	WAF		new uptrend	gold
Westwits	WWI		breached downtrend	gold exploration/development
Western Areas	WSA		testing downtrend	nickel
Wolf Minerals	WLF		down	tungsten
Totals	39%	56	Uptrend	
	25%	36	Downtrend	
		144	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.

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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	33	22.9%
Copper	18	12.5%
Oil/Gas	10	6.9%
Gold Exploration	10	6.9%
Uranium	8	5.6%
Graphite	6	4.2%
Potash/Phosphate	7	4.9%
Zinc	6	4.2%
Nickel	5	3.5%
Coal	5	3.5%
Mineral Sands	5	3.5%
Iron Ore	3	2.1%
Tin	3	2.1%
Lithium	4	2.8%
Silver	3	2.1%
Diamonds	3	2.1%
Bauxite	2	1.4%
Other	13	
Total	144	

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