

# GRAPHITE

A practical look at pricing and  
investment trends

## Industrial Minerals

Graphite Conference – London 2018

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HALLGARTEN & COMPANY

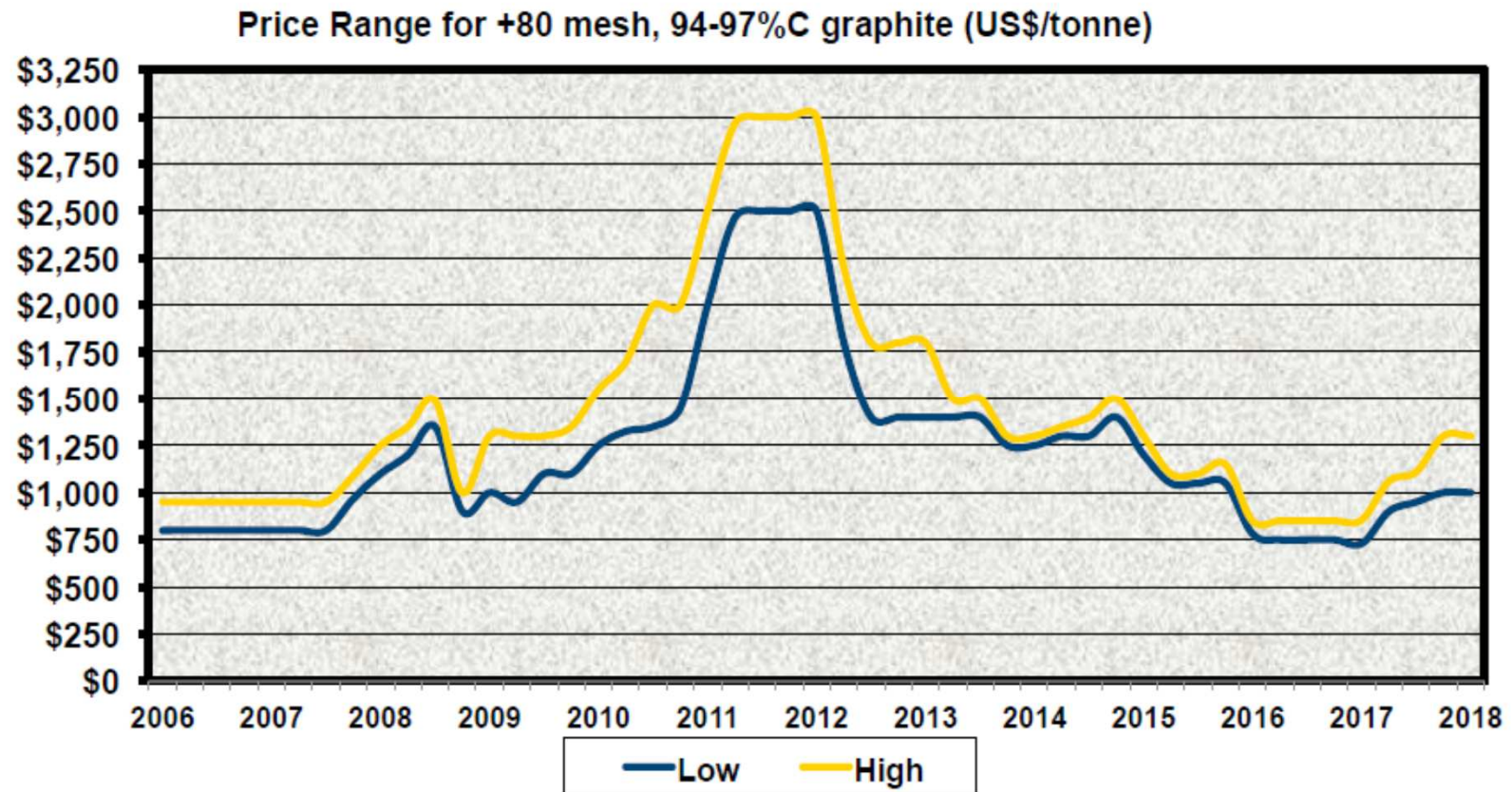
## THE BIG ISSUES

- **What has happened with graphite pricing since 2017 and what changes could we expect to see as we approach 2020?**
- **Could it be argued that a rise in graphite prices may not yield more investment and if this is true what would bring greater investment to this industry?**
- **What will the future look like for giant producers and smaller graphite plants?**

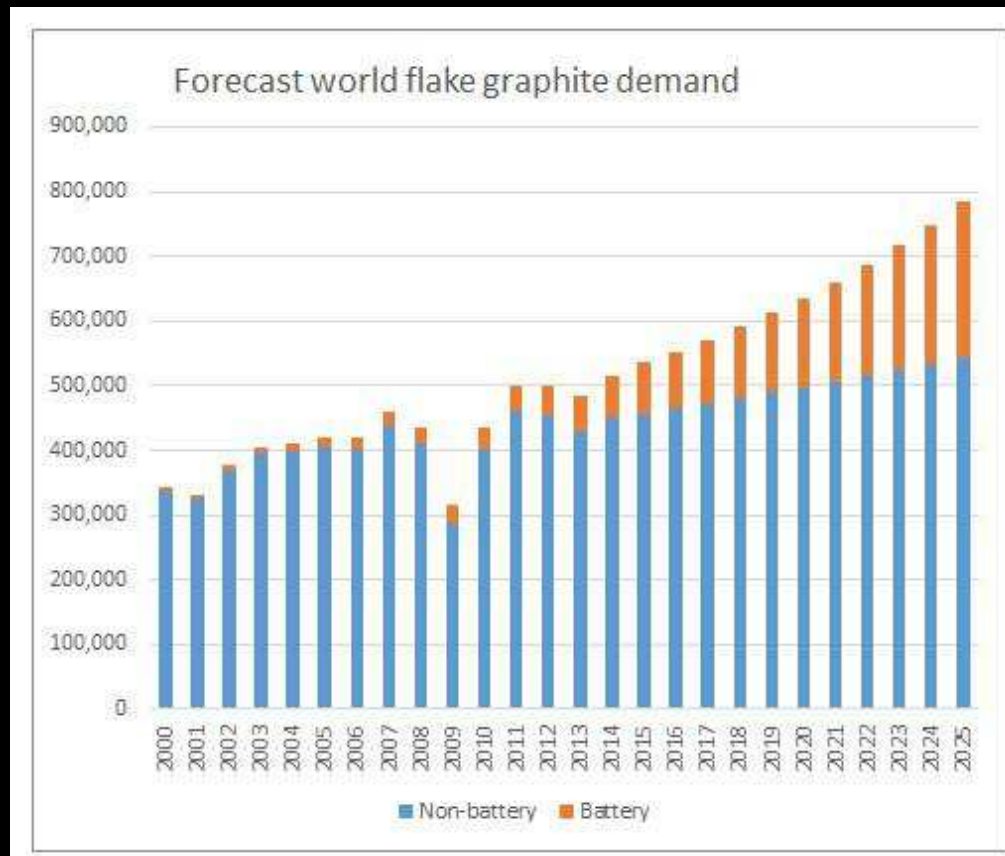
## REGIONAL & INTERNATIONAL CHALLENGES

- We'll start with a truism – there is no shortage of graphite – there is just a scarcity of non-Chinese production
- In a world with international tensions and pushing and shoving over punitive tariffs, claims of currency manipulation and fears of territorial creep, anything can happen
- There is a trend in a number of metals (e.g. Tungsten) to non-Chinese sourcing by major offtakers
- Low barriers to entry and wide geographical spread of mineral deposits mean that graphite is one of the least critical metals in the long-term

## THE LONG-TERM PRICE



## BATTERIES MAKE UP MOST INCREMENTAL DEMAND



The graph has been prepared using data from the US geological survey up to 2014. Forecasts for non-battery use are based on a growth rate of 1.7% per year (extrapolated from data between 2000 and 2014). Forecasts for battery-grade graphite demand are based on the forecast battery demand growth, assuming a split of 65% natural to 35% synthetic and a yield of 0.4 tonnes of battery-grade graphite per tonne of flake graphite.

## THE CHINA SYNDROME

The Chinese would love to own the downstream in graphite, like they do in Rare Earth oxides, but lacking domination of the raw material (and relatively easy barriers to entry in the West) means applying any squeeze would only result in competition rapidly arising.

China to build Strategic Reserve: By 2020, reserve must exceed 80% of China's domestic capacity to hold a steady "bottom line" of supply

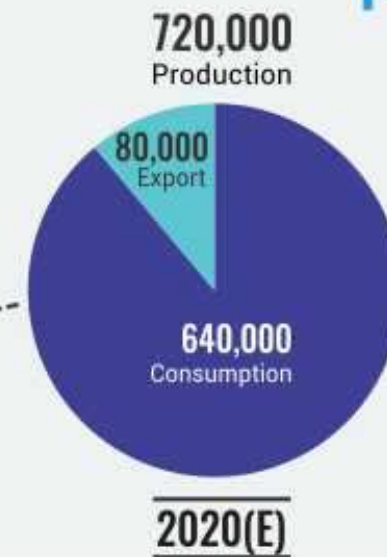
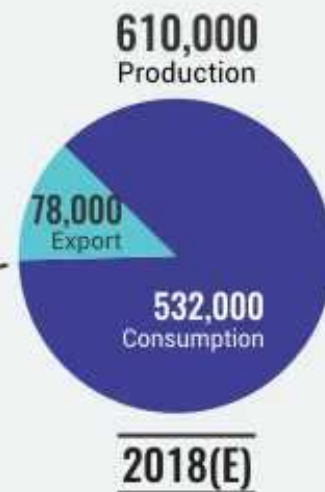
New Tax on Chinese polluting operations coming in effect in January 2018(2)

Graphite mining is rather akin to quarrying and thus environmental issues are not at the mine. It is the processing that is the polluting component in the Value-Added chain, particularly the use of CFCs.

Predatory pricing is tough to coordinate and with quotas and tariffs likely to lose traction with growing non-China production

IN ANY CASE....

## China Graphite Electrode Production, Consumption & Export



E- Estimated Figure, Source: IC Carbon.

## GRAPHITE 2.1?

The first flush of the Graphite boom was in 2013. There had been graphite players before then but the real expansion came during a “dead time” for the rest of the mining space.

A swarm of new players appeared. However, financing dried up. Values faded and the graphite players joined the rest of the mining sector in the “dog house”.

Some determined companies soldiered on with funds raised during the “good days”. A number of other companies were repurposed (particularly in Canada) as gold stories or, ironically, as Lithium plays.

The Lithium ion battery boom revived interest in battery materials (Lithium, Cobalt and to a lesser extent Graphite) generally. There has been a pullback in Lithium valuations over the last nine months.



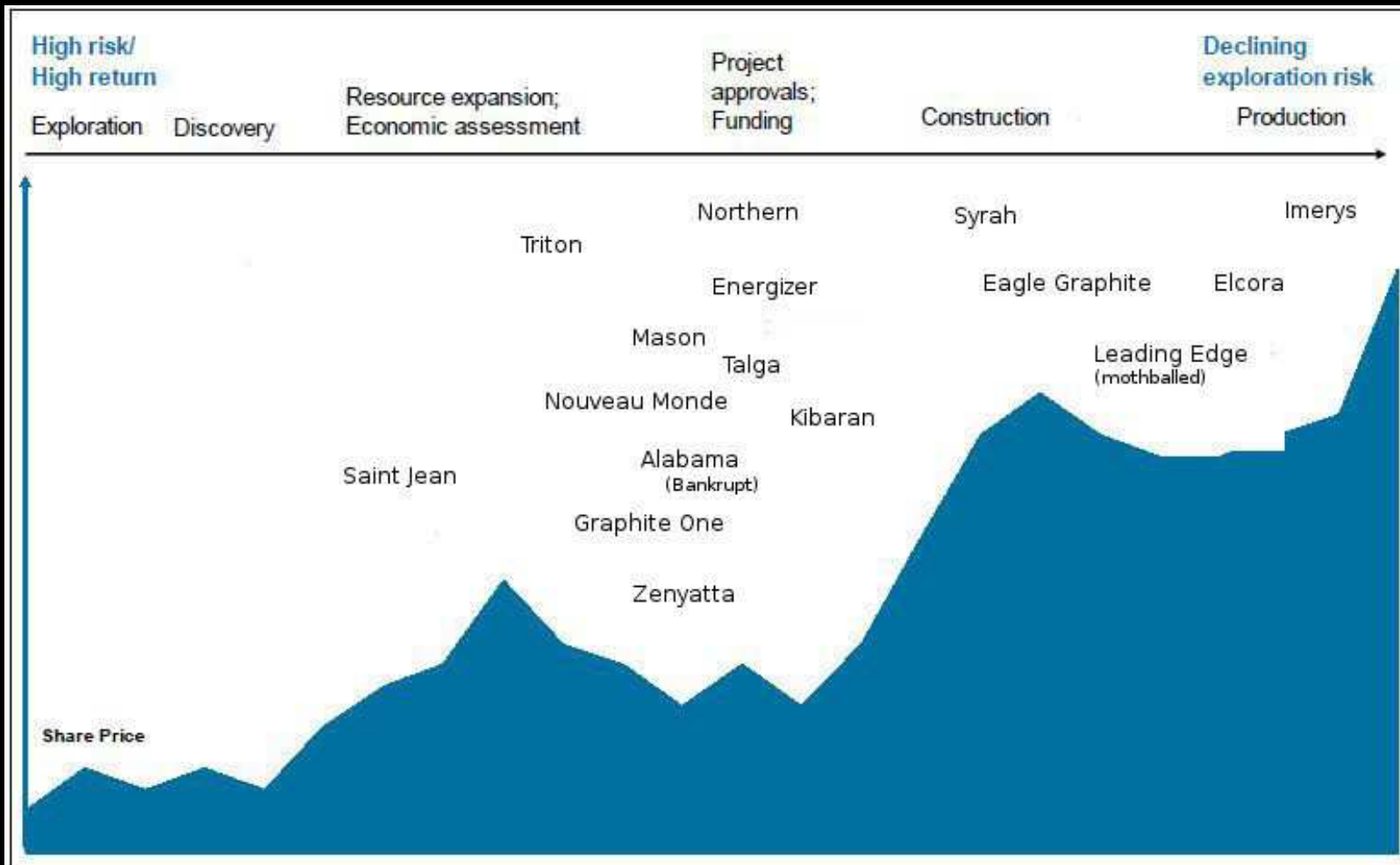
## WHAT NEXT?

- **There is no need for more exploration.**
- **There is a need for known deposits to be moved into development at acceptable cost per ton of output.**
- **CapEx needs to be at the lower end**
- **Equities markets have shown themselves to be faddish and graphite is past its “hottest” phase**
- **Many companies (e.g. Talga, Elcora) are looking at the possibilities of mid-stream processing and niches as mining alone lacks the value-added component**

## SOME PROJECTS TO CONJURE WITH

	Ticker	CapEx	Grade Cg Resource	Cost per Tonne	Location	Status
Leading Edge Materials	TSX.v: LEM	US\$16.7mn	9.3%	US\$730	Sweden	Mothballed
Northern Graphite Corp	TSX-v: NGC	C\$101mn	2.2%	C\$556	Canada	Feasibility 2012
Nextsource Materials	TSX: NEXT	C\$18.4mn	6.1%	US\$353	Madagascar	Feasibility 2015
Syrah Resources Ltd	ASX: SYR	US\$138mn	19.0%	US\$286	Mozambique	Commisioning 2018
Nouveau Monde Mining	TSX-v: NOU	C\$180.8mn	4.0%	C\$660	Canada	PEA 2016
Magnis Resources Ltd	ASX: MNS	US\$270mn	5.4%	US\$559	Tanzania	Feasibility 2016
Kibaran Resources	ASX: KNL	US\$77.5mn	8.3%	US\$500	Tanzania	Feasibility 2015
Mason Graphite	TSX.v: LLG	C\$166mn	17.2%	C\$376	Canada	Feasibility 2015
Zenyatta Ventures	TSX-v: ZEN	US\$411mn	3.9%	US\$2,046	Canada	PEA 2015
Elcora Resources	TSX: ERA	-	n/a	n/a	Sri Lanka	Producing

# THE RACE TO PRODUCTION



## FUTUROLOGY

- **Prices over the long term should be fairly stable with a slight uptrend. A supply crunch is unlikely.**
- **A number of mine/processing complexes should come into operation in the West between now and 2022**
- **China will not be a threat to supply, in fact it may be less of a force**
- **There will be a realisation that graphite mining is neither a high capex nor particularly complex endeavour**
- **Graphite is the least supply-constricted and least geographically-restricted element in the battery supply chain and as such should be of least concern to manufacturers and other end-users**