

# FINANCIAL REVIEW

**SE** Companies and Markets

**HD** **Hi-tech graphite offshoot could be the gold of the digital age**

**BY** Simon Evans

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Putting **lead** in pencils remains the mainstay of the graphite industry, but it is the high-tech offshoot graphene and its potential in the digital age that is driving interest among a group of miners and explorers.

Graphite demand around the world is rising, driven by use in lithium ion batteries and fuel cells that power smartphones and hi-tech vehicles.

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But the most promising products may be graphene nanosheets, one atom thick, that could be used in the digital, communications and automotive industries by giants including Apple, Sony, Toyota, Xerox, Samsung and the \$24 **billion** vehicle group Tesla.

Some believe graphene has the potential to be the hi-tech **gold** of the new age.

But old-fashioned economics have a habit of intervening. Demand for traditional graphite is rising in a global market. About 1.2 **million** tonnes is produced annually for industrial uses such as steel-making and the manufacture of lubricants, brake pads and pencils.

Miners are restarting graphite mines and trying to get new ones operating to tap into projections of further increases in demand for those traditional uses. The hi-tech upside from graphene could provide a future bonus.

The quality and cost competitiveness of those **operations** will dictate winners and losers among those trying to snare a piece of the action.

There is also a race against time as science meets commerce. Companies and research institutions are yet to fully harness the commercial applications of graphene, which has the capacity to accelerate the steady growth projections for graphite as new uses are developed.

The poster child of the Australian Securities Exchange is Syrah Resources, which has grown from a penny dreadful to a market capitalisation of \$580 **million** on interest in its Balama graphite project in Mozambique.

Valence Industries has dusted off the Uley graphite mine, near Port Lincoln on South Australia's Eyre Peninsula, which was mothballed in 1993 because of a decline in graphite prices.

It has reprocessed graphite piles and in early April began putting the finished product into bags ready for **sale** in Asia.

It aims to have new production up and running this year and is currently the only graphite manufacturer in Australia. Paradigm shift

Gerard Anderson, the managing director of Archer Exploration, which aims to have its Campoona graphite deposit on South Australia's Eyre Peninsula in production by late 2015, said the graphite industry was undergoing a major structural shift as new carbon-based technologies emerged.

"There is a paradigm shift under way and that is driven by the discovery of graphene and its attributes," he said.

Those projects at the higher-value end of the graphite market with crystalline ultra-fine graphite deposits were best positioned. But he accepts that for now, blue sky thinking determines graphene and its future use.

"The market for graphite is still heavily dictated by industry," Mr Anderson said. "The focus for most players is for the here and now."

Archer and Valence have pumped funds into research programs at the University of Adelaide in the race to unlock more industrial applications of graphene. It is a global race however, with the UK's Chancellor of the Exchequer George Osborne announcing last month as part of the UK budget, a £14 million (\$25 million) investment into a Graphene Applications Innovation Centre in north-east England to do further work on its electrical and thermal conductivity. The UK claims that it was the first to isolate graphene and it should be leading the race to fully commercialise it.

Perth-based Kibaran Resources is another ASX-listed company with its fortunes closely tied to the promise of graphite through a project in Tanzania.

Kibaran executive director Andrew Spinks said almost 70 per cent of graphite is produced by China, and much of the remainder from India and Brazil.

He expects Chinese firms to be part of a consolidation of projects around the world, with higher-quality deposits the focus.

"There's going to be significant consolidation in the future," he said.

New production being brought on stream needs to be high quality and cost competitive.

Those without a sales agreement or an off-take agreement with industrial customers would find it very hard to enter the market, he said.

"It's a very opaque market."

Sales agreements are made directly with customers and it is difficult for outsiders to assess the prices being paid for the highest-quality graphite.

Supply and demand are in balance because it was a closed market, with deals done between producers and users, he said.

Some of the Chinese production of lower-grade graphite is under review by authorities because of environmental concerns about the use of acid to improve its quality.

Stockbroker Patersons Securities outlined in a report this year that while there had been a price bubble in 2011 and 2012, underlying price growth for flake graphite had been an average of 15 per cent over the past decade.

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