



Spotlight on spherical graphite intensifies

July 2010

Lithium-ion battery anticipation is the talk of industry as miners and developers eye future riches



Spherical graphite was again the talk of the industry last month as it emerged that a number of graphite developers and leading producers have lithium-ion (Li-ion) batteries firmly on their radar.

The graphite world has been watching the explosion of interest lithium industry and Li-ion battery demand forecasts in preparation for what could be just as a fruitful time for miners of graphite.

“Li-ion, specifically, continues to be the Holy Grail of graphite,” said Andrew Rill, vice president of materials management at USA based processor, Superior Graphite.

There is a growing belief that there will not be enough natural graphite to satisfy any demand boom in Li-ion batteries that is set to come from an increased amount of hybrid and electric vehicles on the world’s roads. And with each car battery consuming between 3-7kg of spherical graphite, producers are hotly anticipating this new market.

While availability of lithium resources have been under intense discussion over the last three years, graphite has only recently been under the spotlight.

“The graphite industry was in the tank for over 15 years, there was little exploration or development, and there are very few high purity, large flake graphite deposits available,” said Greg Bowes, recently appointed chief executive officer of Industrial Minerals Inc. (*see p.29*) which is developing the Bissett Creek resource in Canada.

Bowes argues that the present efficiency in the battery industry means more raw material than actually is used in the final battery product will be needed. He estimates that Li-ion batteries are only 50% efficient so the industry will need 20 times more graphite than lithium.

The graphite processing industry is also at the same stage, Bowes says.

“Two thirds of the graphite is consumed in the process of making spherical graphite for Li-ion batteries so you need to start with 60 times as much,” Bowes told **IM**.

“Lithium people are forecasting incremental lithium carbonate demand of 200,000 to 300,000 tonnes by 2020. If we assume that equates to say 50,000 tonnes of lithium metal then 3m. tonnes of flake graphite is required,” he said.

Global production of natural graphite is 1m. tpa but only 40% of this is estimated to be flake graphite, the sufficient

quality of grade suitable for batteries. The majority of this is amorphous graphite mined in China.

Bowes explained that regardless of the numbers that are forecasted, there will not be enough natural graphite to satisfy even modest demand increases unless more production comes on-stream.

Europe's leading graphite miner, Graphit Kropfmuhl AG (GK), believes that the supply/demand will be more balance for the industry. A closer relationship between supplier and the end market is also expected.

"The competition between Chinese producers for such grades will increase which will result in concentration of fewer producers with a strong connection to anode producers," said Christoph Frey, technical director at GK.

He added: "GK invented spherical graphite for Li ion-batteries more than 10 years ago. Since then the market has significantly changed as the products became commodities which can be provided in sufficient quality and quantity by many producers, most of them located in China."

With nearly all the focus on electric vehicle batteries, demand for which is yet to be realised, existing markets such as power tools and mobile phones are flourishing.

"In Africa, the expected use of mobile phones was underestimated. Most of Africa still has no network and all regions are working towards accessing this necessity. You don't have to look far to see that in few years time there will be a big need for mobile phones," said Matimba Kuoza of South Africa's Jonkel Group.

"Every 3-5 years people want to upgrade for newer technology and that means manufacturing a new mobile phone and battery," said Kuoza. Indeed this rate of renewal is far higher in Europe and North America and is a market which US lithium producer, FMC Corp. expects to grow 6% p.a. over the next ten years (*IM June 2010, p.13: FMC Lithium expansion points to robust markets outside of EV*).

The Jonkel Group is looking to bring South Africa's first graphite mine on-stream by the end of this year from the country's Limpopo province (*see p.31*).