Industrial scale tests conducted on Epanko graphite confirms excellent suitability for use in Lithium-Ion Batteries

Results strongly support Kibaran's strategy of targeting established anode manufacturers in the leading East Asian region

Key Points

- **Industrial scale production of spherical graphite confirms Epanko graphite has the requisite physical and chemical properties for use in high quality lithium-ion batteries**
- **Key properties including particle size distribution, tap density and impurity levels are in-line and meet leading battery anode manufacturer specifications**
- **Results strongly support strategy to become a key player in the supply chain for the growing lithium-ion battery market through a binding offtake agreement and partnership with Sojitz**
- **Next round of testing underway at leading German battery testing facility**

Kibaran Resources Limited (ASX: KNL), is pleased to provide the analytical results from the latest round of Epanko spherical graphite samples sent to East Asian battery anode manufacturers.

Spherical graphite was produced using material obtained by industrial scale flotation testwork in Asia from the Epanko bulk sample that was completed in August 2016. The bulk sample produced approximately 20 tonnes of Epanko graphite concentrate and provides a substantial platform to underpin production of spherical graphite samples in a timely manner as Kibaran progresses negotiations with anode manufacturers.

The results released today follow on from the initial high quality round of spherical graphite results published in November 2016 and demonstrate the strong momentum being generated by Kibaran in conjunction with its chosen offtake partner Sojitz Corporation to target the industry leading East Asian anode manufacturers[1].

Importantly, Sojitz is an established supplier to the lithium-ion battery supply chain and possesses a deep understanding of customer purchasing behaviour in the lithium-ion battery industry.

The results further demonstrate the suitability of Epanko spherical graphite for use in the manufacture of Lithium–ion battery anodes, through tests in industrial scale facilities. Key physical properties such as tap density[2], BET[3] and reversible capacity[4] are in-line and meet the tight specifications provided by leading battery anode manufactures. Importantly, the samples also demonstrated the remaining impurities[5] - in particular iron, silicon, vanadium and ash content - were below specified levels.

The next round of testing is currently underway in a German battery facility and will focus on electrochemical characteristics[6]. Kibaran looks forward to providing an update on the next round of results which are expected over the next month.

Kibaran Managing Director Andrew Spinks commented: "We continue to be encouraged by positive feedback from leading battery anode manufacturers as we advance through the negotiation process. Our spherical graphite was produced from large scale industrial-sized facilities, rather than lab-scale testwork, thereby allowing battery anode manufacturers to determine real world performance and replicability of the material.

Kibaran is well positioned to become a leading producer of graphite products with all requisite mining studies completed for Epanko, a granted mining licence and attracted "blue chip" offtake partners in Sojitz and ThyssenKrupp. These critical elements underpin the well advanced project financing process with KFW Bank and Nedbank."

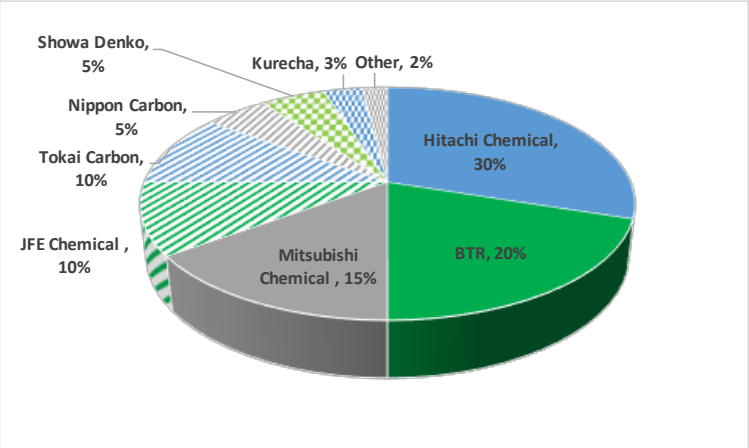
Epanko spherical graphite properties from sample provided to East Asian anode manufacturer

Measure	Unit	Outcome
Particle Size Distribution		
D10	(micron)	10.3
D50	(micron)	15.0
D90	(micron)	22.1
D002[7]	(nm)	0.3356
Tap Density	(g/cc)	0.98
BET	m^2/g	7.4
Reversible Capacity	mAh/g	367
Irreversible Capacity at 1st Cycle[4]	mAh/g	5
Fe	ppm	12
Si	ppm	19
Ash Content	%	0.01
Moisture Content	%	0.01

Footnotes

1. East Asian anode manufactures represent a significant portion of global anode production and are the primary targets of Kibaran's spherical graphite marketing strategy in conjunction with its partner Sojitz.

Consistent with Kibaran's strategy anode production is dominated by Japanese & Korean firms



Source: Company data, Goldman Sachs Global Investment Research, September 2016

2. Tap density should be high and indicates how much active material (graphite) can be put into the battery
3. BET should be low to reduce active material losses during the formation of the battery
4. Reversible capacity should be as close as possible to the theoretical maximum of 372 mAh/g and irreversible capacity (loss of active material) should be as low as possible
5. Deleterious elements must be at low levels for acceptance. Elements that are particularly important due to negative impact on battery performance and safety include Fe, Ca, S, Si, Ni, Zn, Cr, Al, Cu and V.

6. The focus of the testwork currently underway covers galvanostatic tests with charge-discharge tests at constant current. This will deliver further information on reversible and irreversible capacities and charge/discharge voltage. Additionally rate capability tests are undertaken, these tests are performed to obtain information on the capacity (material performance/kinetic) as a function of current.
7. D002 indicates the degree of graphitisation and interlayer spacing. Kibaran graphite perfectly crystallised; the ideal value of d002 for graphite is 0.3354 nm.

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