

premium quality graphite uniquely tanzan

23<sup>rd</sup> February 2018 ASX Announcement

# **Update on Epanko Graphite Project and Pilot Plant Strategy**

Kibaran Resources Limited ("Kibaran" or the "Company") (ASX: KNL) is pleased to provide a comprehensive update on the progress being achieved from the significant activity currently being undertaken on all aspects of its Epanko Graphite Project in Tanzania and an outline of the important developments in the global graphite market.

#### **KEY POINTS**

- Demand for quality graphite is strong and accelerating on the back of lithium-ion battery use in electric vehicles
- Epanko is now widely-recognised as a quality graphite project which is ready for immediate development. The project has been subjected to rigorous, independent due diligence by bank-appointed engineers, it is robust with strong economics, conservative design, costings and pricing
- Product qualification is critical to sales given each end-user has its own unique product requirements.
   Epanko graphite has completed this qualification process which culminated in securing the sales and offtake agreements
- Feasibility study to produce battery (spherical) graphite for sale directly to battery anode manufacturers is completed. New clean non-toxic purification process developed with proprietary technology for production of battery (spherical) graphite with 99.98% purity
- Opportunity to supply battery (spherical) graphite directly to battery manufacturers is a reality with a decision to construct the pilot plant in Germany for production of commercial quantities this year
- New mining regulations in Tanzania have been reviewed by Kibaran and its legal team, which found they provide no serious impediment to development at the project level
- Kibaran and lenders now awaiting the formation of the new Minerals Commission in Tanzania, which
  is expected shortly
- Kibaran positioned to place Epanko in front of Minerals Commission as soon as it is operating
- Government stated on 14<sup>th</sup> February 2018 via Ministry website they are prepared to make any necessary changes in the Acts or Regulations to ensure all stakeholders benefit

#### **EPANKO GRAPHITE PROJECT**



Natural Flake Graphite (NfG)

Production NPV<sub>10</sub> EBITDA 60ktpa US\$211m US\$44.5m

#### **DOWNSTREAM PRODUCTION FACILITY**

Spherical Graphite (SpG) (F) Fines (UN) Unpurified (P) Purified



Production NPV<sub>10</sub> EBITDA 20ktpa US\$145m US\$30.5m

Figure 1: Value proposition of development strategy

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# **Tanzanian and Epanko Project Update**

The mining regulations supporting the new mining laws were issued by the Tanzanian Government on 10<sup>th</sup> January 2018. Kibaran has reviewed the regulations and is waiting for the Minerals Commission to be operational in order to discuss matters that the Regulations are silent on and their impact on the proposed Epanko debt financing arrangements.

The Tanzanian Government has recently stated it is ready to make any necessary changes to the legislation in order to ensure that all the stakeholders in the sector can benefit and in turn contribute to the growth of the economy. This was stated on Friday 14<sup>th</sup> February 2018 in Arusha by the Deputy Ministers of Mines Stanslaus Nyongo and Doto Biteko during a meeting with mining stakeholders including TAMIDA, the mining entrepreneur's association and FEMATA, the association of miners.

Speaking on the matter, Deputy Minister Nyongo said that the Government through the Ministry of Mines will not hesitate to amend anything in the Act or Regulations that will be shown to be a hindrance in the mining business in the country.

Positive meetings were held with Tanzania's High Commissioner to Japan, Australia and South Korea, His Excellency Mathias Chikawe in Canberra and, also with the Minister for Minerals, Honourable Angellah Kairuki (MP) in Tanzania. The Minister provided some guidance for resolving various issues. In both meetings the Company presented the significant benefits of the development of the Epanko Graphite Project.

- Direct employment and training of 250 Tanzanians during construction and over 200 Tanzanians during operations. The multiplier effect is expected to reach 10-15 times, benefitting up to 3,000 people
- Over US\$500m will be invested in Tanzania via taxes, royalties, inspection fees, salaries and wages, purchases of goods and services and social development in the first 20 years of operation
- Positive economic and social impacts for the Ulanga District and Morogoro Region

The project has been subjected to rigorous independent due diligence by bank appointed engineers, is robust with strong economics (NPV $_{10}$  US\$211m). To ensure unconditional signoff by independent engineers, conservative design, costings and pricing parameters have been incorporated. This process has significantly derisked the project on both technical and financial fronts with the Epanko project globally being the only graphite project to be subjected to this degree of independent scrutiny.

Project finance discussions are well advanced, with prospective lenders awaiting certainty to be provided from the Mineral Commission on various aspects of the legislation affecting lending arrangements. These banks and the Australian Government are assisting Kibaran to secure Mining Commission endorsement.

Kibaran is well positioned to comply with the new mining Regulations, having completed an Equator Principles compliant bankable feasibility study that satisfies the stringent International Finance Corporation Performance Standards and World Bank Group Environmental, Health and Safety Guidelines. The project development plans are consistent with the standards required by the new mining Regulations.

The Company has completed all documents required to secure Government development approvals including the Resettlement Action Plan (RAP).

All approvals are in place and the project ready for immediate development, with the development team and engineers on standby.

The Company will provide an update on its Epanko development timeline after it has presented it to the Mining Commission.

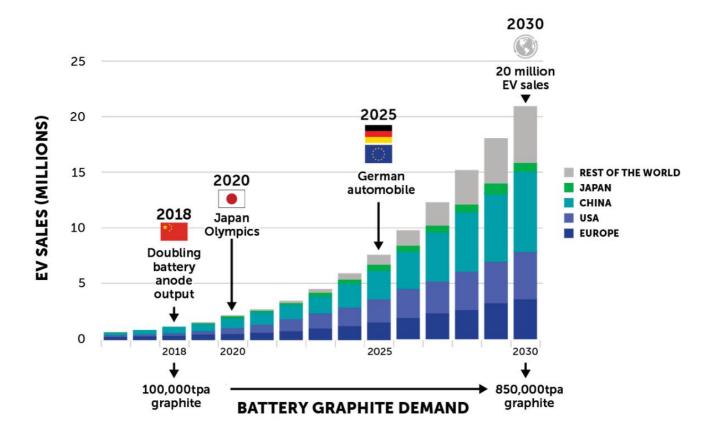


# **Graphite Market and Sales**

Kibaran's focus has been product qualification by end users, which is the critical path to graphite sales in both the traditional and battery (spherical) graphite markets. Product qualification is also essential to locking in market share and long-term support.

Kibaran has recently visited all major anode manufacturers in China, Korea and Japan as part its product qualification process and secured first-hand knowledge of these markets through support from its Japanese partner Sojitz Corporation.

Demand for battery (spherical) graphite is now increasing with world consumption at 100,000tpa, due largely to a doubling of China anode demand. Based on direct customer feedback from our partners, Kibaran is expecting growth of 300 and 400% in the Japanese and South Korean markets by 2020. Given projected global EV sales, it is forecast that natural battery (spherical) graphite demand will increase to 850,000tpa by 2030.



**Figure 2:** Electrical Vehicle uptake with critical events creating a shift in demand for natural battery (spherical) graphite (ie Tokyo Olympics in 2020 where it is expected that Japanese EV's will be showcased)

The Epanko development strategy is founded on supplying traditional graphite end-user markets, however due to the current consumption growth driven by increasing EV global adoption rates, demand for battery (spherical) graphite is now increasing strongly and supports the expanded production of 60ktpa for the Epanko project. Total graphite world demand is currently 700,000tpa and Epanko production will represent ~8.6% of the global market.



# **Battery (Spherical) Graphite for Lithium-Ion Battery Market**

The feasibility study to produce battery grade graphite from Epanko natural flake graphite is completed and it's important to note that China is currently the only source of natural battery (spherical) graphite for the global Lithium-ion market.

During the feasibility study Kibaran developed a 'green' purification method that replaces dangerous and toxic hydrofluoric acid currently being used in China and which will be cost competitive with current Chinese supply.

Completion of this Feasibility Study has facilitated the following key developments.

- Product qualification of battery (spherical) graphite product samples met specifications at leading battery anode manufacturers for markets in Japan, Korea, China, Germany and the United States.
- Demand models developed to support Epanko mine and battery (spherical) graphite production growth from 2020 and 2025
- Kibaran battery (spherical) graphite production of 20ktpa represents 30% of market demand outside of China
- Pilot plant to be located in Germany and subsequently expanded to enable initial commercial sales of spherical graphite products
- Evaluation of graphite sources other than Epanko supports early production and expansion plans

Feasibility testwork at Epanko confirms ability to produce a higher-grade graphite product from fresh ore with no additional milling or cleaning stages, providing Kibaran with a significant body of graphite as customer demand transitions from a market dominated by refractory applications to battery (Spherical) grade.

Graphite typically comprises almost half of the total battery raw materials and expected future demand for this critical input for Lithium-ion batteries has led to recent increases of up to 40% in battery (spherical) graphite pricing.



Figure 3: Lithium-ion Battery (Pouch Cell) showing raw material composition and graphite anode



# **Africa Mining Indaba Conference**

The compelling investment case for Kibaran was recognised in the very positive response to the Company's presentation in the Investment Battlefield forum at Mining Indaba. Kibaran was a finalist (top 4) out of 24 companies across Africa that contested in the Investment Battlefield competition. Mining Indaba is the world's largest mining conference.



Figure 4: Mining Indaba presentation at Investment Battlefield Finals

During the conference the Hon. Masaki Ogushi, Japan's Parliamentary Vice-Minister of Economy, Trade and Industry presented a global outlook for Electric Vehicles and its ties to demand for raw materials in Africa. The presentation provided Government statistics for the future demand for battery graphite by [2030] which it forecast to be 15 times greater than current demand.



Figure 5: Japan Government promoting ties between Japan and Africa at Mining Indaba 2018



# **German Automobile Battery Conference**

Mr Christoph Frey, Kibaran's Technical Director attended the 8th International Advanced Automobile Battery Conference in Mainz, Germany to directly contact and gain insight into the future directions for EV development in Germany battery technology. A key observation from the conference was that existing Li-ion battery technology will continue into the future, but will be further developed, focused on 'advanced Li-ion battery'. This 'advanced Li-ion battery' or 'second generation Li-ion battery' will continue to require graphite as the main material for the anode. Other salient points include;

- The shift to 'Advanced Li-ion' which is expected from the German market is fundamental to Kibaran's decision to initially locate the pilot plant in Germany, to access this future market demand for battery graphite
- Advanced Li-ion battery's will contribute to Germany developing its own Gigafactory
- Automotive manufacturers view for the next 10-15 years is that Lithium-ion battery's (Li-ion) will dominate
- Solid state batteries could enter the market in the future however many challenges remain to develop solid state batteries for the mass market. Automobile market is reluctant to make swift changes so that the adoption of Advanced Li-ion and solid-state battery technologies will occur gradually over the next 20 years (refer figure)
- Graphite will also be required as a conductive material for use in the solid-state battery

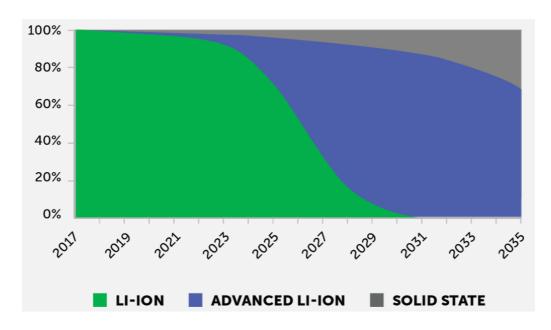


Figure 6: Expected shift to 'Advanced Lithium-ion Battery's (Li-ion) and solid state batteries (Source: FMC AABC conference Germany 2018)

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