

4 July 2018

ASX Announcement

EcoGrafi Battery Graphite Update

Diversification to secure larger share of lithium-ion battery market

Kibaran Resources Limited (Kibaran or the Company) (ASX: KNL) is pleased to provide an update on the application of its proprietary eco-friendly purification process to existing global graphite feedstocks, as part of the pilot plant testwork program currently underway in Germany.

Highlights

- **Technical review completed of established graphite producers to prioritise the procurement of product samples**
- **Samples sourced from graphite producers in Europe, India, South America, Africa and Asia**
 - **Assessment of physical and chemical properties completed**
 - **Standardisation undertaken to achieve a common flake distribution and carbon grade**
 - **Purification using proprietary eco-friendly process underway**
- **EcoGrafi** trademark approved by Federal Government agency IP Australia

A total of eight product samples have been sourced from a range of established graphite mines around the world and subsequently standardised in readiness for purification using the Company's new non-hydrofluoric acid process, with initial results expected by mid-August 2018. Following an initial assessment of physical and chemical properties, each of the samples have been processed to produce a normalised flake distribution and carbon grade as a baseline against which chemical purification testing will be performed. Standardising the samples enables evaluation of the performance of each of the natural flake graphite products under the purification process and determine the influence of regional geology on the production of battery (spherical) graphite for lithium-ion battery applications.

During the sample standardisation process, an assessment was completed of bulk/tap density and chemical composition, to understand regional differences in natural flake graphite products and evaluate key specifications used by battery anode manufacturers to determine preferred sources of purified battery (spherical) graphite for various lithium-ion battery performance requirements.

The natural flake size distribution of the product samples is important in determining the yield that is achieved during the spheronisation process and also impacts upon tap density, a critical battery (spherical) graphite specification for end users. Following completion of the initial purification testing of the samples, an assessment will be undertaken of the resulting specific surface area measurements using the Brunauer–Emmett–Teller (BET) process, the crystallographic features and the quantitative elemental composition of the impurities in the graphite.

Not all graphite occurrences are suitable for producing battery (spherical) graphite and the ability to manufacture high quality, cost competitive, purified battery (spherical) graphite products is significantly influenced by the composition of the natural flake feedstock. As lithium-ion battery manufacturers increasingly

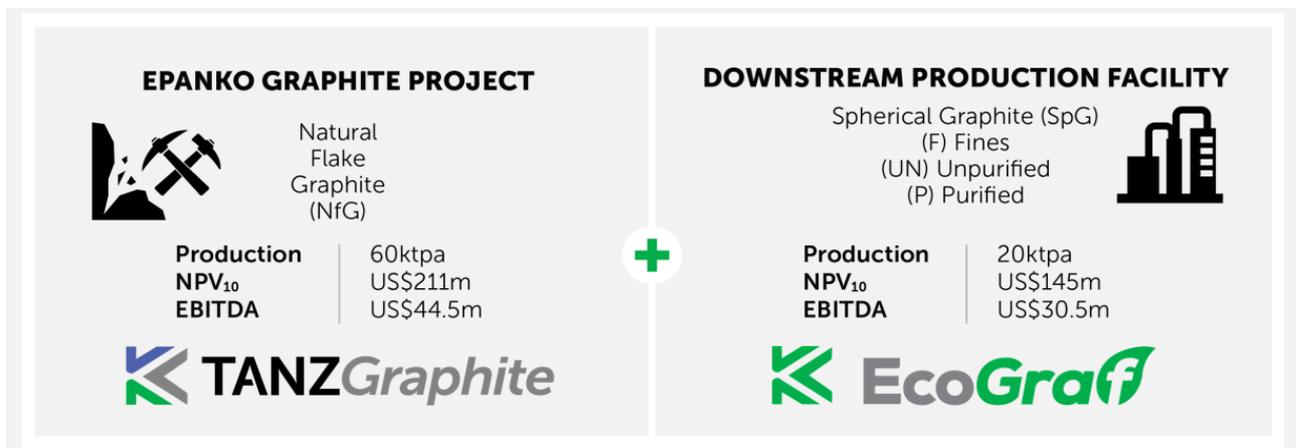
seek to improve battery cost, weight and performance, anode producers are focussing on securing consistent supplies of high purity, more sustainably produced, battery spherical graphite.

The pilot plant testing of global natural flake graphite supplies is being conducted in parallel with the Epanko graphite down stream optimisation program, that is nearing completion and will be reported shortly.

Kibaran’s commercialisation of **EcoGrafi** is based on anode manufacturers’ plans to diversify future supply arrangements from their present reliance on Chinese battery graphite, that is produced using an environmentally harmful hydrofluoric acid purification process. Customer feedback on the **EcoGrafi** process has been exceptionally positive and successful application of this eco-friendly process to other sources of natural flake graphite will provide an opportunity for the early start-up of battery (spherical) graphite facilities in Europe and Asia, in parallel with the development of the long life and scalable Epanko Graphite Project in Tanzania.



Tanzania	Mining and production of natural flake graphite (initially 60ktpa) <u>Micronising and spheronising</u> of battery graphite (Dar es Salaam)
Germany	Spherical graphite - pilot plant and expansion up to 3,000tpa
Europe/Asia	Spherical graphite – commercial plant(s) • 5-20,000tpa purified spherical graphite • 4-17,000tpa <u>unpurified</u> fines



The production targets and forecast financial information referred to in this announcement were originally reported to the ASX by the Company on 21 June 2017 and on 5 December 2017. All material assumptions underpinning the production targets and forecast financial information reported in those ASX announcements continue to apply and have not materially changed.

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