

## STRATEGIC ALLIANCE TO INVESTIGATE GRAPHITE AND GRAPHENE APPLICATION IN 3D PRINTING

### HIGHLIGHTS:

- **MoU signed with 3D Group to investigate opportunities for graphite and graphene application in 3D printing**
- **Graphite and graphene has the potential to transform the fast growing US\$3.8 billion 3D printing market**
- **Agreement involves the formation of a joint R&D company to develop patents and seek relevant partnerships**
- **Complements European alliance, with graphite increasingly used in thermally efficient building products due to stricter energy efficient building codes worldwide**

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Kibaran Resources Ltd (ASX:KNL, the “Company”) is pleased to advise it has entered into a Memorandum of Understanding (MoU) with 3D Group Pty Ltd over the formation of a strategic alliance to investigate opportunities for the application of graphite and graphene in the fast growing 3D printing market.

3D printing is a revolutionary technology that involves the creation of three dimensional, solid objects from a digital file, of virtually any shape. The 3D printing industry is evolving rapidly, with accelerating technological development forecast to drive the market value from the current US\$3.8 billion to US\$16.2 billion by 2018<sup>1</sup>.

A key development underway is the application of graphene in the 3D printing process. Graphene is a one-atom thick, near transparent sheet of graphite recognised around the world as stronger than a diamond and steel but is flexible, and is better at conducting electricity than copper<sup>2</sup>. Graphene has the potential to significantly expand 3D printing applications and – based on the predictions of some commentators - even drive a new industrial revolution.

Kibaran is developing its Mahenge and Merelani graphite deposits in Tanzania, with the aim of becoming a stable and secure supplier of natural flake graphite. Key attributes of the Company’s mineralisation are a very coarse flake size, with high crystallinity and purity, all of which are well suited for the production of graphene.

Under the strategic alliance, the use of expanded graphite – which has similar characteristics to graphene – will also be investigated in the 3D printing process. The Company’s graphite mineralisation at the Mahenge project has been proven to possess properties necessary for the manufacture of expanded graphite (ASX announcement 5 June 2013).

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<sup>1</sup> *Canalys 3D printing forecast 2013-2021* - [http://www.canalys.com/static/press\\_release/2014/canalys-press-release-310314-3d-printing-market-grow-us162-billion-2018\\_0.pdf](http://www.canalys.com/static/press_release/2014/canalys-press-release-310314-3d-printing-market-grow-us162-billion-2018_0.pdf)

<sup>2</sup> *Graphene Flagship* - <http://graphene-flagship.eu/>

3D Group is an emerging marketer of 3D printing systems and services. The company plans to be Australia's leading 3D printing company, designing, manufacturing and marketing 3D printers and services for the domestic and international markets (refer [www .3-d-group.com](http://www.3-d-group.com))

The terms of the MoU are as follows:

- Establish a joint research and development company '**3D Graphtech Industries**'
- Pursue research and patents for graphite and graphene applications for 3D printing
- Engage in collaborative research programs
- Seek value-add partnerships to develop and pursue opportunities in the area of graphite, graphene and 3D printing
- Graphite to be sourced exclusively from Kibaran's projects

Kibaran and 3D Group will work towards a binding framework to formalise the strategic alliance, with a view to establish 3D Graphtech Industries by the end of calendar 2014. Kibaran's Executive Director Mr Andrew Spinks commented:

"3D technology has the potential to bring about a quantum shift in the way we produce new materials and products, including whole structures or individual components, in a raft of new industries.

"Its commerciality has been proven with the production of car parts, jewellery, dental applications such as crowns, and there are also investigations underway to print houses for a fraction of the cost.

"The strategic alliance with 3D Group positions Kibaran as a potential supplier of expanded graphite and graphene products through the mine supply chain, and creates additional shareholder value in the downstream sector.

"The MOU will not deter from Kibaran's main focus of advancing its graphite projects in Tanzania, with the Company focussed on finalising the binding agreement with Richland Resources and a JORC resource upgrade expected shortly for the flagship Mahenge Graphite Project."



*A Chinese company has built a house using 3D printing*

## **EXPANDED GRAPHITE AND EMERGING THERMAL MARKET**

The 3D Group strategic alliance will complement Kibaran's existing alliance with the European market through its binding partnership with a European graphite trader.

In particular expanded graphite, with its excellent conductivity, is increasingly being used in the manufacture of thermally conductive building panels that allow air-conditioning and heating systems to operate more efficiently. This new technology is being driven by stricter building codes that demand the use of energy efficient building parts.

"The technology is being driven out of Europe with ThyssenKrupp and SGL Group leading the field in research and development work, and commercial applications," Mr Spinks said.

"The potential growth of expanded graphite in the emerging thermal market is significant, and is considered to be on par with the use of graphite in the fast-growing battery market.

"Kibaran is well placed to capitalise on these market trends, with expanded graphite a highly sought after commodity and demanding a premium price to graphite."

**About Kibaran Resources Limited:**

Kibaran Resources Limited (ASX: KNL or “Kibaran”) is an exploration company with highly prospective graphite and nickel projects located in Tanzania.

The Company’s primary focus is on its 100%-owned Epanko deposit, located within the Mahenge Graphite Project. Epanko currently has an Inferred Mineral Resource Estimate of 14.9Mt, grading 10.5% TGC, for 1.56Mt of contained graphite, defined in accordance with the JORC Code<sup>1</sup>. This initial estimate only covers 20% of the project area. Metallurgy has found Epanko graphite to be large flake and expandable in nature.

Kibaran also has rights to the Merelani-Arusha Graphite Project, located in the north-east of Tanzania. Merelani-Arusha is also considered to be highly prospective for commercial graphite.

Graphite is regarded as a critical material for future global industrial growth, destined for industrial and technology applications including nuclear reactors, lithium-ion battery manufacturing and a source of graphene.

In addition, the Kagera Nickel Project remains underexplored and is located along strike of the Kabanga nickel deposit, owned by Xstrata, which is considered to be the largest undeveloped, high grade nickel sulphide deposit in the world.

<sup>1</sup> “This information was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported.”



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The information in this report that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr Andrew Spinks, who is a Member of The Australasian Institute of Mining and Metallurgy included in a list promulgated by the ASX from time to time. Andrew Spinks is a director of Kibaran Resources Limited and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Andrew Spinks consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.