



ASX Announcement  
29 May 2013

## **Uley Graphite suitable for production of highly commercial graphene**

### **HIGHLIGHTS**

- Positive findings from Monash University's research in Uley graphite suitability for graphene
- Uley graphite similar to benchmark for graphene production & potential to easily make into graphene
- Market for graphene increasing with need for longer lifespan batteries escalating
- Aim to build local intellectual property to capitalise on energy storage industry

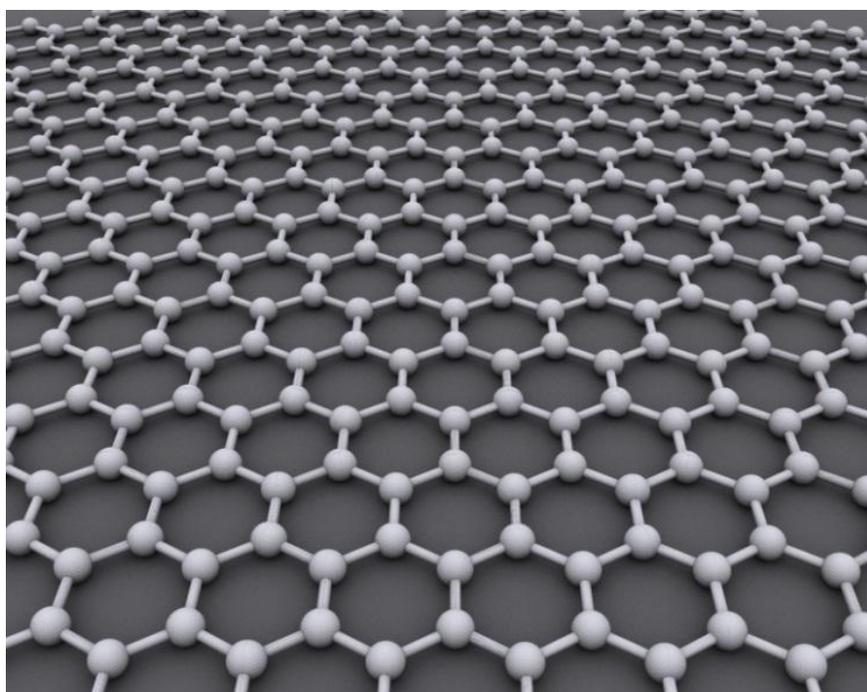
*Based in Melbourne Victoria, Strategic Energy Resources (SER) is a versatile explorer working on a diversified portfolio of exploration assets including the world class Uley Graphite Project. The company aims to create shareholder value through the systematic exploration of our tenements with the aim of becoming a producer.*

Monash University in its first year of research has confirmed Uley graphite is suitable for the production of the ultra-light and multifunctional graphene.

It is well documented that graphene, the product of raw graphite, plays a key role in the construction of the batteries for high end applications. The market for high end applications continue to rise daily as the demand for smartphones, tablets, laptops and electric vehicles with longer-lifespan batteries increase.

In fact, commercialisation demands have already seen the production of graphene from graphite increase with 100 tonnes of graphene produced in 2012 and expected production of 600 tonnes in 2017.\*

Graphene is a one atom thick flake of carbon atoms that has multifunctional properties, including exceptional electron and thermal transport, mechanical properties, barrier properties and high specific surface area that make it a potentially disruptive technology and a creator of new markets.



*Figure 1: Atomic structure of Graphene*

The three year research project is jointly funded by Strategic Energy Resources (SER), and the Australian Research Council .The SER alliance with Monash is building a local intellectual property in order to utilise the vast advances nanotechnology is making to use graphite-based materials for electronics, energy and environmental applications directly targeting the burgeoning energy storage industry.

The findings from the Monash University yearlong study are as follows:

- *The natural graphite samples were chemically and physically very similar to commercially available benchmark artificial graphite from Bay Carbon in terms of their chemical composition, microstructure, and crystalline nature. The samples although contained traces of  $Al_2O_3$  and  $Fe_2O_3$ .*

- *In order to produce graphene-like materials, graphene-oxide (GO) was produced by chemical oxidation and exfoliation of graphite. Detailed analysis showed us that the quality of this material was virtually no different from that produced from Bay Carbon graphite suggesting that Uley graphite can be easily exfoliated and made into high surface area graphene-like material.*
- *We have produced electrode materials from this high surface area graphene-like material, measured their properties extensively and established the feasibility of production of high quality graphene-based electrodes from Uley graphite.*

Realising the potential of graphene, several countries have invested heavily on this technology. The European Union is funding 1.35 billion euros, South Korea is spending \$350 million and the United Kingdom is investing £50 million in commercialisation hubs.

In addition to establishing the feasibility, the team has obtained breakthrough in two discoveries. These are:

- *WS2012-024 titled “A method for patterning conducting graphene pathways in graphene oxide using focused ion beams” – this discovery will enable production of minaturised super-capacitor devices for powering small volume biomedical devices*
- *“A method to produce highly oriented graphene films for opto-electronic applications” –this patent pending discovery will enable production of high quality transparent and electrically conducting films*

Further Information:

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*\*(Source: “The World Market for Graphene to 2017”, Future Markets, Inc. 2011).*