

ASX Announcement

16 May 2017

BEST Battery Development Agreement Finalised.



First Graphite (ASX: FGR) is pleased to advise all agreements for the development of the BEST battery have now been finalised and executed.

Highlights

- Affirmation of the advanced status of research being undertaken on the Best Battery by Swinburne University of Technology.
- Confirmation of the impressive performance compared with existing supercapacitors, based on patent pending technology developed by Swinburne
- Increase in the level of equity that can be earned in the global licence from 60per cent, to 70 per cent
- Immediately focusing on the development of a prototype AA battery for test marketing

FGR has undertaken extensive due diligence on the BEST Battery Project, engaging highly experienced personnel, Dr Christine Scala, to provide an independent scientific assessment. The key points from the due diligence report were;

- the science behind the supercapacitor is well developed with Swinburne University of Technology being at the leading edge of the development of advanced supercapacitor technology.
- the performance of Swinburne's capacitor is impressive, being significantly greater in energy density than the nearest other superconductor, Swinburne reported. This provides evidence that the Swinburne invention is significant

Swinburne University of Technology Supercapacitor

Patent-pending technology developed by Swinburne overcomes the energy density limitations with existing supercapacitors, achieving the following potential advantages;

- 10x better energy density than competing devices due to use of nanopores and graphene based technology
- 10,000x faster charge/discharge rates than for chemical storage devices, such as lithium-ion batteries
- 10,000 charge/discharge cycles due to no degradation of electrodes
- Ultra-thin and ultra-light in weight
- highly flexible and integratable
- environmentally friendly due to the absence of chemicals

These efficiencies are achieved through the use of laser printing technology and graphene oxide to create an ultra-efficient energy storage medium in a greatly simplified process. An innovative inter-digital design also provides for a much shorter ionic path to maximise energy and power density.

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Advantages Offered by the BEST Battery

The table below, provided by Swinburne, provides a simple comparison of what the parties believe the BEST Battery could achieve compared to the standard lithium-ion battery, based on laboratory test work undertaken to date.

Parameters	Supercapacitor (BEST Battery)	AA Rechargeable battery
Storage mechanism	Physical	Chemical
Charge time	1-10 seconds	1 – 4 hours
Cycle life	Minimum 10,000 cycles	300 – 1,000 cycles
Cell voltage	1.5 to 2.3 V	1.25 – 1.5 V
Energy density (Wh/L)	5 (current state) 50- 60 (target for this project)	100 to 200
Power density (W/L)	Up to 10,000	35 to 300
Cost per Wh	\$20 (current state) \$0.30 (target for this project)	\$0.50 - \$1.00 (large system)
Service life	10 to 15 years	1 to 2 years
Disposal	No special requirement, environmentally friendly	Land fill, harmful to environment

Table 1: Overall comparison of existing supercapacitor with Lithium-ion battery

Increased Equity Being Earned

As a consequence of the due diligence undertaken by the Company and the encouragement thereby received, FGR has succeeded in increasing the potential level of equity it can earn in the holding company of the global licence for the BEST Battery from 60 per cent to 70 per cent. The cost of this increase was a restructuring of the terms of options being issued, with the final tranche increasing from 5 million to 7.5 million, at increased exercise prices and longer dated expiration.

Commenting on the transaction FGR's Managing Director Craig McGuckin said

"We are pleased to have finalised the agreements with Swinburne and now look forward to developing the first proto-types and showing the world how revolutionary this technology really is. If it is as good as we believe, and we can confirm that it can be produced on a large scale, it will be the energy storage technology of the future. Chemical batteries might even become obsolete."

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first graphite

A high-quality graphene producer

About First Graphite Ltd (ASX: FGR)

First Graphite produces high quality graphene from high grade Sri Lankan vein graphite.

First Graphite seeks to develop graphene production methods and acquire graphene related intellectual property which can provide further revenue related opportunities.

About Graphene

Graphene, the well-publicised and now famous two-dimensional carbon allotrope, is as versatile a material as any discovered on Earth. Its amazing properties as the lightest and strongest material, compared with its ability to conduct heat and electricity better than anything else, mean it can be integrated into a huge number of applications. Initially this will mean graphene is used to help improve the performance and efficiency of current materials and substances, but in the future, it will also be developed in conjunction with other two-dimensional (2D) crystals to create some even more amazing compounds to suit an even wider range of applications.

One area of research which is being very highly studied is energy storage. Currently, scientists are working on enhancing the capabilities of lithium ion batteries (by incorporating graphene as an anode) to offer much higher storage capacities with much better longevity and charge rate. Also, graphene is being studied and developed to be used in the manufacture of supercapacitors which are able to be charged very quickly, yet also be able to store a large amount of electricity.

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