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ASX:TLG

Talga Graphene Boosts Li-ion Battery Performance

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Corporate Information

ASX Codes	**TLG, TLGOA**
Shares on issue	**181.9m**
Options (listed)	**44.9m**
Options (unlisted)	**30.7m**

Company Directors

Terry Stinson
Non-Executive Chairman

Mark Thompson
Managing Director

Grant Mooney
Non-Executive Director

Stephen Lowe
Non-Executive Director

- **Outstanding performance of Talga graphene in initial Lithium-ion battery tests. Results include:**
  - **Excellent battery capacity (energy storage) exceeding that of graphite industry average by ~27%;**
  - **Low capacity losses (reversible capacity >99.5%); and**
  - **High stability (coulombic efficiency 99.9%).**
- **Talga graphene source material was not subject to costly milling, shaping or coating steps of typical graphite anode manufacturers**
- **Results achieved using Talga's bulk graphene nanoplatelets (GNP), rather than Talga's few layered graphene materials (FLG) – raises potential to compete at today's anode market cost structure**
- **Partnerships to develop material for European and Asian Li-ion battery end users being assessed**

Technology minerals company, Talga Resources Ltd ("Talga" or "the Company"), is pleased to provide an update on initial benchmark testing of it's graphene in Lithium-ion ("Li-ion") batteries manufactured at the Warwick Manufacturing Group's ("WMG") Energy Innovation Centre, University of Warwick UK.

Following successful tests of the Company's micrographite product (ASX:TLG 10th Oct 2016), Talga announced its intention to move towards testing its graphene nanoplatelets ("GNP") as the active material of Li-ion battery anodes (Fig 1).

Talga is targeting the energy storage sector as part of its product development strategy and is developing prototype Li-ion battery anode materials to meet the increasing demand for affordable, high performance, eco-friendly energy storage.

Preliminary test results are highly encouraging with Talga material exhibiting outstanding electrochemical performance that surpasses capacity measures for commercially available graphite anodes[1], delivering up to ~27% more energy density.

Increased battery energy density translates into increased range for an electric car or additional usage time for a smart phone or mobile device.

Figure 1 *Talga GNP Li -Ion battery being tested in climate cabinet rack.*

Talga Managing Director Mark Thompson commented:

"Talga continues to receive highly encouraging results from its various Li-ion battery development programs. Use of our graphene material has clear potential to enable batteries for electric vehicles, electronic devices and other energy storage applications to run longer or to be built lighter and thinner.

There is a perception that next generation anodes are either a long way off or prohibitively expensive, but this work shows this may not be the case. These outstanding test results are based on Talga's bulk GNP's which have the potential to be economically competitive with today's flake and synthetic graphite anode materials that are subject to costly shaping and coating steps before use in the downstream battery supply chain. Our material has the potential to bypass the majority of this expense and associated negative environmental impacts to provide the clean supply chain that major battery and device manufacturers are seeking."

Battery Test Results

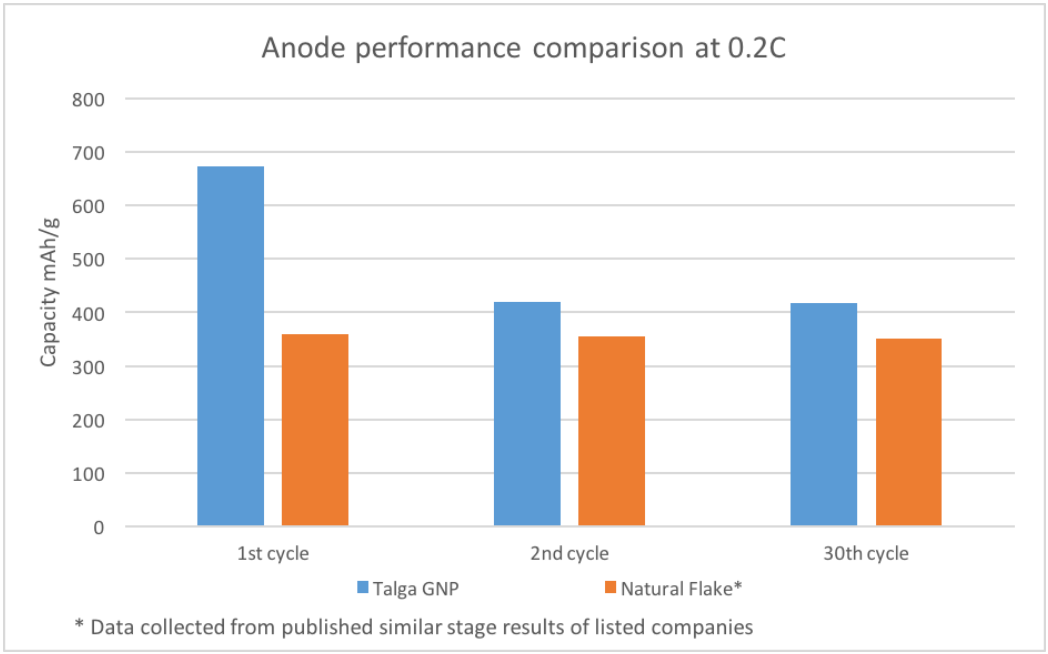
The Li-ion battery anode material testing program being run by WMG and the Energy Division of Talga Technologies Limited (UK) utilises graphitic anode materials, including GNP's, produced at Talga's test process facility in Germany.

Through a range of work packages, the program is designed to test and develop Talga's highly conductive graphite and graphene to increase performance and offer simpler processing compared to standard graphite anode materials. Use of Talga materials also provides the opportunity to reduce the need for costly conductivity enhancing additives that are commonplace in industry.

The WMG testwork is currently moving through the benchmarking component of the program. Talga micrographite, and now GNP, have been measured in electrochemical and coin cell anode tests using industry standard formulations.

Talga's GNP anode first cycle capacity, as measured across an average of 6 coin cells, was >650 mAh/g, which is close to the theoretical discharge capacity[2] for GNP anodes of ~740mAh/g. Further, the results at the second and 30th cycles showed a high reversible capacity at greater than 99.5% at 0.2 C (5 hour charge and 5 hour discharge) rate with an average capacity at ~420mAh/g. This is outstanding compared to published industry data which averages ~330 mAh/g for spheronised and coated graphite at the same stage[1] and other listed company published data (Fig 2). The coulombic efficiency of Talga's GNP anode material was 99.9%.

Figure 2 *Talga GNP Li -Ion battery anode comparison.*



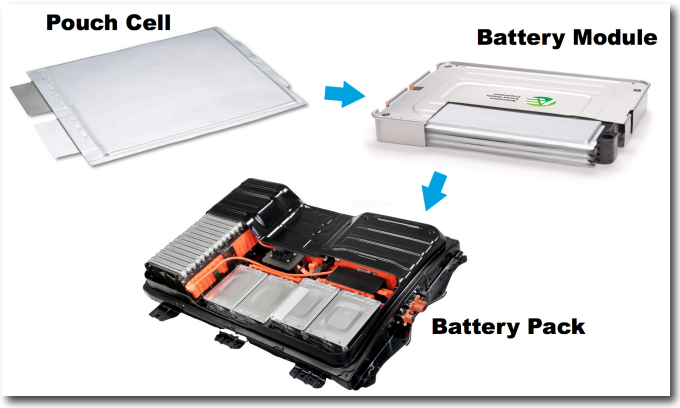
Discussion and Next Steps

The test results have demonstrated that not only does Talga's GNP anode performance equal or better similar graphene testing results found in literature, but also performance that substantially exceeds that of typical spherical or synthetic graphite that comprise highly processed materials. This is significant as the Talga material was not optimised and received minimal processing and no coatings prior to testing.

Further, the test results were achieved using Talga's bulk graphene materials. Talga considers that this provides an opportunity that near-term Li-ion battery improvements can be achieved at cost structures competitive to current markets.

Baseline Li-ion battery performance has now been established using Talga micrographite and GNP anodes with industry standard formulations. Talga's next step is to develop and test environmentally friendly aqueous formulations for application on large roll to roll coaters commonly used in today's battery manufacturing processes. Following this, larger scale 'pouch cells' will be created using WMG's manufacturing line and dry room facilities. Pouch cells are a 'flat' Li-ion battery form for assembly of automobile, home power storage and other larger scale applications (see Fig 3 and Glossary below for details of technical terms).

Figure 3 *Pouch cells in a battery module and pack (courtesy of Nissan).*



Future work will see further analysis to demonstrate batch to batch consistency and endurance performance. Several partnership opportunities to develop Talga's material for European and Asian Li-ion battery end users are being assessed. Results of Talga's prototype battery testwork is being used to engage with these parties.

For further information visit www.talgaresources.com or contact:

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References

1 "Prospects for reducing the processing cost of lithium ion batteries", David L. Wood III, Jianlin Li, Claus Daniel. Journal of Power Sources (2015).

2 "An Advanced Lithium-Ion Battery Based on a Graphene Anode and a Lithium Iron Phosphate Cathode", Hassoun et al. Nano Letters (2014).

About Talga

Talga Resources Ltd (ASX: TLG) is a technology minerals company enabling stronger, lighter and faster products for the coatings, battery, construction and carbon composites markets using graphene and graphite. Talga has significant advantages owing to 100% owned unique high grade conductive deposits in Sweden, a pilot test facility in Germany and in-house graphene product technology. Testing of Talga materials and products is underway with a range of corporations including industrial conglomerates Tata and BASF subsidiary Chemetall, UK listed Haydale and German based Jena Batteries.