Talga Presentation at the WCX™ Digital Summit

Battery anode and graphene additives company Talga Resources Ltd ("**Talga**" or "**the Company**") (**ASX:TLG**) is pleased to provide a copy of the presentation delivered at the WCX™ Digital Summit technical expert panel discussion: 'Graphene for Automotive Applications - Lighter, Stronger, Better' at 8.00am (EDT) on 18 June 2020.

The presentation is available on the Company's website via the link below:

http://www.talgaresources.com/irm/content/presentations.aspx?RID=301

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About Talga

Talga Resources Ltd (ASX:TLG) is building a European source of battery anode and graphene additives, to offer graphitic products critical to its customers' innovation and the shift towards a more sustainable world. Vertical integration, including ownership of several high-grade Swedish graphite projects, provides security of supply and creates long-lasting value for stakeholders. Joint development programs are underway with a range of international corporations.

Company website: **www.talgagroup.com**

WCX Digital Summit

16 - 18 June 2020, sponsored by Ford

Graphene: Enabling better batteries for electric vehicles

Mark Thompson, Managing Director, Talga Resources

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Why Graphene?

Graphene is an ultra-thin form of graphitic carbon which can be added to new or existing materials

It can make materials stronger, lighter and more functional, thereby increasing performance and sustainability

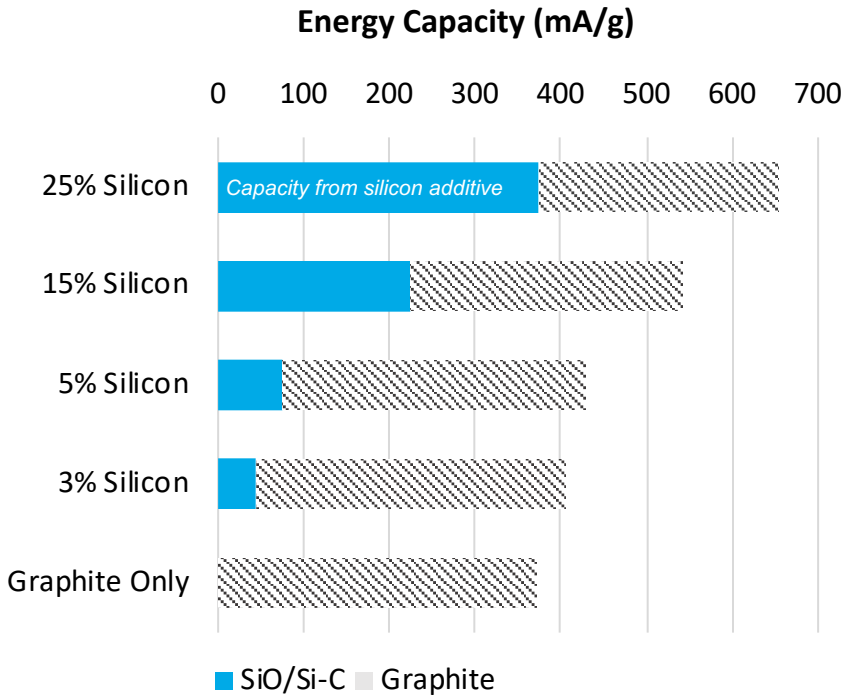
In electric vehicles there are numerous applications with great promise in production and operation

This presentation reviews how graphene can solve a major problem in next-gen Li-ion batteries where increasing amounts of silicon are sought

Higher capacity through silicon anode

The electric mobility industry needs higher capacity batteries for longer range

- Silicon anode is theoretically capable of >10x energy capacity of graphite anode in Li-ion battery
- But today, silicon is being blended into graphite in only small amounts (3-5% weight) due to major and fundamental issues
- Higher energy capacity can translate to longer range of electric vehicles or less weight (smaller batteries), so solving silicon issues can have big impact on EV use and production



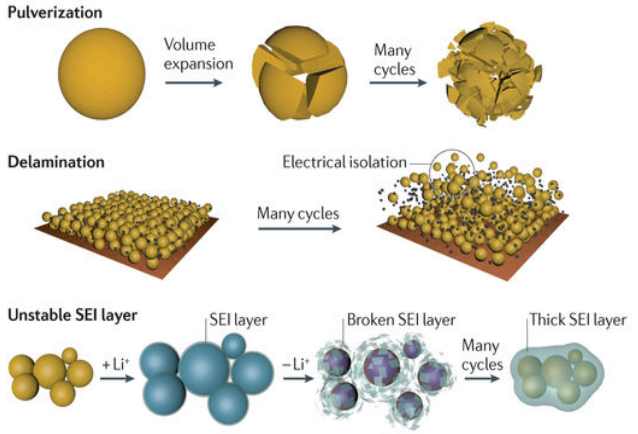
Higher capacity through silicon anode

Silicon anodes have profound issues to overcome in practical use

- Silicon changes volume by 300% in charge/discharge cycles (compared to graphite 10%)
- Volume change leads to a range of issues including:

  - pulverization/breakage
  - delamination from current collector
  - build-up of thick, solid electrolyte interface (SEI) decreasing lithiation kinetics and ‘robbing’ lithium from cathode and electrolyte

- So the more silicon, the shorter battery life, and failure ensues (rapidly)



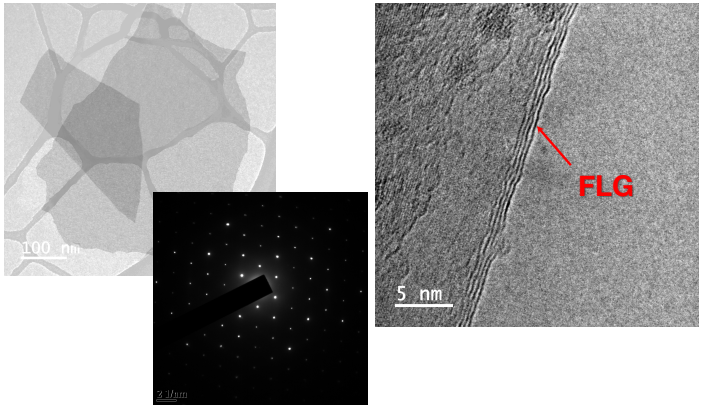
Choi & Aurbach 2016 https://www.nature.com/articles/natrevmats201613#f2

Graphene to the rescue

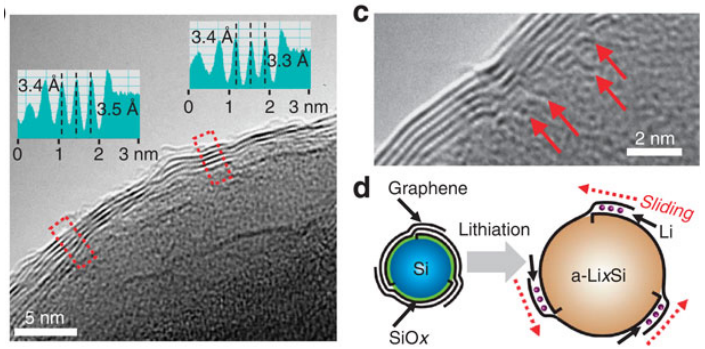
Ultra-thin carbon nanomaterial enabling practical silicon anodes

- Graphene additives or composites can enable silicon anodes to stabilise and extend cycle life
- Graphene can work in various modes including protective coatings and nano-structures to control pulverisation during volume change, retain kinetics and moderate SEI formation

TALGA GRAPHENE



SAMSUNG GRAPHENE COATED SILICON

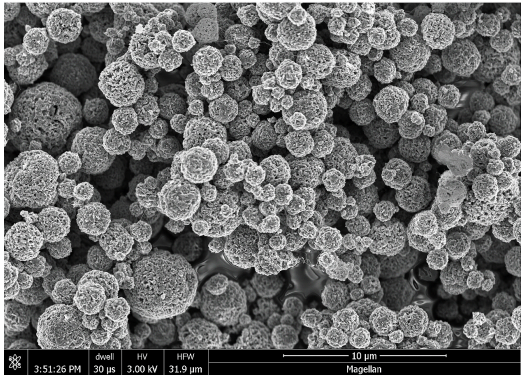


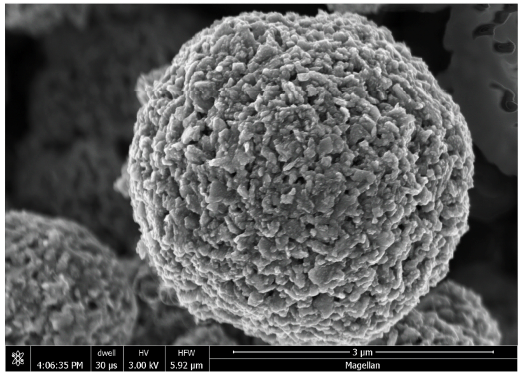
Samsung, Nature Communications 8:1561. Graphene balls for lithium rechargeable batteries with fast charging and high volumetric energy densities.

Silicon Anode Composite: Talnode-Si®

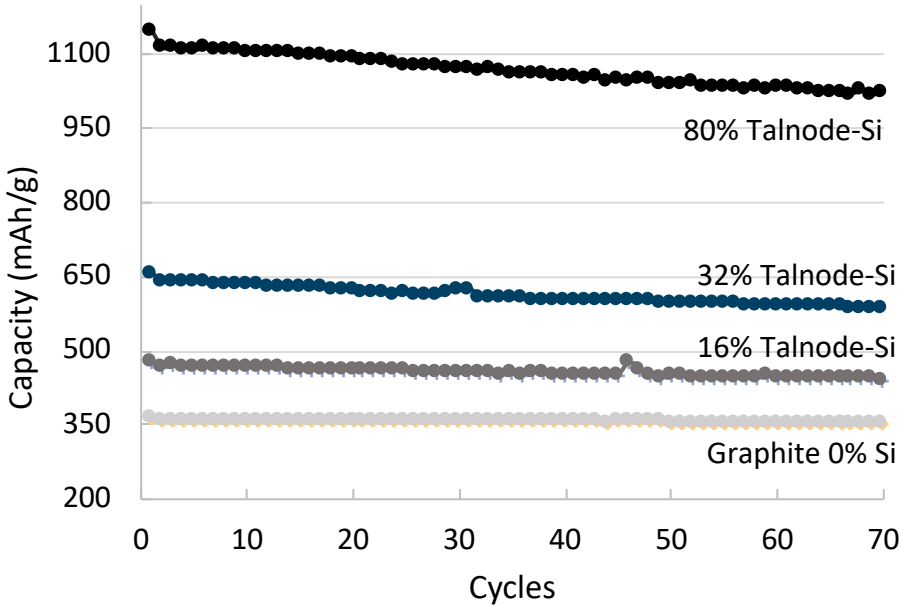
Graphene silicon composite electrode additive for ‘drop-in’ blending with current graphite anodes

- Nanostructure Porous Graphene Silicon composite electrode additive for existing graphitic anodes
- Produced by mechanical method (not CVD) using external silicon supply and Talga graphene
- Production method includes dry mixing and blending with graphene, utilizing off-the-shelf industrial technology for commercial scalability
- First cycle efficiency up to 91% dependent on silicon loading, good cycle life & reversible coulombic efficiency in the range 99.7%-99.9%





High Capacity Anode



Talga graphene-enhanced silicon anode blended into commercial graphite anode

- The silicon content in Talnode-Si is ~30%Wt Silicon
- Enables a range of loadings in existing anode blends
- Commercial impact is potential longer range of electric vehicle, or same range with less weight from smaller battery

Lithiation: 1st cycle: 0.1C to 5mV then stays at 5mV until 0.01C, other cycles: 0.2C to 5mV then stay at 5mV until 00.25 C.
De-lithiation: 1st cycle: 0.1C to 1.0V, other cycles: 0.2C to 1.0V.

Thanks!

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