

ASX ANNOUNCEMENT

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Lithium Australia improves battery performance with proprietary refining process.

HIGHLIGHTS

- **Lithium phosphate produced by processing mica using SiLeach®.**
- **Proprietary process used to refine the phosphate generating a high-purity battery chemical suitable for the production of batteries.**
- **Veracity of the product proved in battery production.**

Lithium Australia NL (ASX: LIT, or 'the Company') has successfully generated lithium phosphate from waste materials using its 100% owned SiLeach® process. Furthermore, LIT has, together with ANSTO, developed an elegant and simple means of removing impurities from the lithium phosphate resulting in an exceptionally high-purity refined product, suitable for the manufacture of lithium ion batteries (LIBs), and in particular, those with lithium iron phosphate (LFP) chemistry.

The Company has successfully produced LFP batteries from unrefined, SiLeach® generated lithium phosphate ([21 November 2018](#)). The lithium phosphate refining process was developed to ensure consistency of quality for the production of high performance LFP batteries. The performance of batteries made from the refined lithium phosphate product has been tested at LIT's wholly owned VSPC cathode powder pilot plant in Brisbane, Australia.

The refined lithium phosphate was used to manufacture cathode powder and subsequently LFP coin cells which were then subjected to a standard testing regime and the results compared with industry benchmarks and VSPC's most advanced cathode powders. The results indicate the refined lithium phosphate is an ideal component for the manufacture of high-performance LFP cathode powders.

LIT is confident that LFP products produced using lithium phosphate, refined with the processed developed by LIT/ANSTO will have significant advantages when compared with those produced using a more conventional lithium carbonate, or lithium hydroxide precursor.

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Comment from managing director Adrian Griffin

“The lithium phosphate refining process is cheap, effective and provides the means to produce high-purity materials with consistent quality. These properties are of paramount importance as we work with leading Chinese battery producer, DLG, to commercialize VSPC cathode powder.

When compared with other lithium chemicals, high-purity lithium phosphate is a winner when it comes to producing LFP batteries, providing two of the fundamental components for the generation of the cathode while simultaneously eliminating the requirement for lithium carbonate or lithium hydroxide. This is a real winner.”

Adrian Griffin

Managing Director

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About Lithium Australia NL

Lithium Australia aspires to 'close the loop' on the energy-metal cycle in an ethical and sustainable manner. To that end, it has amassed a portfolio of projects and alliances and developed innovative extraction processes to convert *all* lithium silicates (including mine waste) to lithium chemicals. From these chemicals, the Company plans to produce advanced components for the lithium-ion battery industry. The final step for Lithium Australia involves the recycling of spent batteries and e-waste. By uniting resources and the best available technology, the Company aims to establish a vertically integrated lithium processing business.

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Lithium Australia to market LFP, the safe lithium-ion battery

Lithium Australia NL (ASX: LIT) is forming a business partnership with leading Chinese battery producer DLG Battery Co. Ltd ('DLG') to launch a new range of lithium-ion batteries ('LIBs') in the Australian market, with a focus on industry-scale energy storage systems ('ESS').

The new marketing division, Soluna Australia Pty Ltd ('Soluna Australia'), will provide technical support, customer service and, importantly, a range of lithium-iron-phosphate (often referred to as lithium-ferro-phosphate or 'LFP') battery options for greater safety and superior performance in ESS applications.

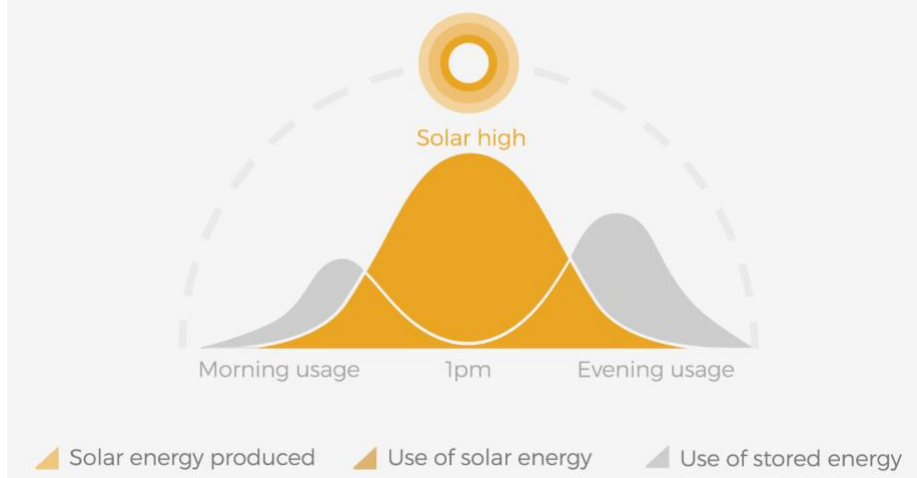
Lithium Australia/DLG Alliance

Lithium Australia has cemented its [partnership with DLG](#) by incorporating a joint marketing division, which will trade as Soluna Australia. Extensive market enquiries have identified strong demand for flexible and tailored LIB and LFP solutions in the ESS sector, which will be the prime focus of Soluna Australia, a company in which Lithium Australia holds 50% equity.

Product range

From a new Australian-based facility, Soluna Australia will supply and service a range of energy-storage products – from residential energy-storage through to industrial energy-storage units. Custom products, in particular for applications such as large-scale storage (including microgrids), will be provided to bespoke specifications.

Most energy is used morning and evenings. Soluna powerbanks minimize waste and pollution by leveraging the power of the sun 24 hours a day.



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Establishing an Australian warehousing and technical facility will provide greater certainty for ESS users currently relying on offshore suppliers.

Battery chemistry

Most of the product range will be available with nickel-cobalt-manganese ('NCM') and LFP options. Lithium Australia, which is a great advocate of LFP for reasons of safety and performance, plans to supply DLG with LFP cathode powders manufactured using Lithium Australia's the cathode powder production technology of its wholly-owned subsidiary VSPC Ltd ('VSPC').

Although VSPC technology can be used to generate most LIB cathode powders, VSPC has maintained a strong emphasis on LFP due to its superior attributes (including safety), which make it the most appropriate choice for ESS applications.

LFP is the commercial LIB chemistry of longest standing. Lithium Australia, through VSPC Ltd, is currently manufacturing LFP cathode powders on a pilot scale, with those powders used by DLG to produce commercial 18650 cells for testing purposes.

Attributes of LFP batteries

LFP, a remarkably versatile battery chemistry, has the following attributes.

- Superior operational life (typically twice the number of duty cycles of other LIB chemistries).
- Excellent safety aspects.
- High charge and discharge rates without thermal runaway (low fire risk).
- Wide operating temperature range (ideal for Australian ESS applications).
- Low supply chain risk (no nickel or cobalt).
- Low-cost, using readily available materials (no nickel or cobalt).

LFP batteries – superior safety

Recent concerns arising from electric vehicle ('EV') fires, as reported in the *Australian Financial Review* on 25 July 2019 ('Lithium miners burnt by car fires' by Paul Garvey), have highlighted public concerns about EV safety, based on the use of LIBs containing nickel and cobalt. Although LFP batteries have a lower energy density than competing nickel/cobalt-based LIBs, their superior safety record makes LFP a preferable option for many applications.

In the ESS market, batteries are commonly located within buildings. LFP provides the greatest safety, combined with longer service life than competing battery technologies.

Market potential

Australia leads the world in the installation of rooftop solar and domestic energy storage units. It has also led the world in the installation of utility-scale ESS and the development of microgrids relying on battery storage for load levelling.

Further, remote hybrid-power applications can allow consumers the advantage of substituting much of their diesel generating capacity with renewables, provided an efficient battery pack forms part of the installation. Soluna Australia is assessing the

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potential for installing a number of hybrid power management systems for evaluation in the local energy market.

Comment from Lithium Australia MD Adrian Griffin

“Our partnership with DLG, a leading Chinese battery producer, provides an opportunity to establish our new division, Soluna Australia, as a leading Australian-based provider of LIBs and technical solutions to the fast-growing ESS market that sits in our own backyard. In addition, Lithium Australia is well on the way to meeting the requirements that will enable VSPC to commercialise its cathode materials and provide Australia with access to purpose-built LFP battery storage, the safest and most effective option for energy storage systems.”

Adrian Griffin

Managing Director

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About DLG Battery Co. Ltd.

Established in Shanghai, China in 2001, DLG is a leading manufacturer of LIBs, with extension to the downstream battery pack business, and has become a well-known supplier of green energy solutions across China. The DLG business encompasses many areas, including LIBs, battery control systems, consumer batteries and a range of other battery-related research, design, manufacturing, sales and service activities:

www.dlgbattery.cn and <https://soluna.co/>.

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