# Investing in a vertically integrated lithium company








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*COMPETENT PERSON'S STATEMENT*

*The information in this report that relates to reporting of Exploration Results is based on and fairly represents information and supporting documentation prepared by Adrian Griffin, a member of the Australasian Institute of Mining and Metallurgy. Mr Griffin is a shareholder in, and managing director of, LIT and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration. He is qualified as a Competent Person as defined in the 2012 edition of the* Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves*. Mr Griffin consents to the inclusion in this report of the matters based on information in the form and context in which it appears.*



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# What Lithium Australia is doing

- **Closing the loop on the energy metal cycle**
- **Disruptive technologies**
- **Sustainability**



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# Lithium Australia – corporate snapshot
# The vertically integrated lithium company

**FSE-listed: ticker 3MW**
**ASX-listed: ticker LIT, LITCE**

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**BOARD OF DIRECTORS**



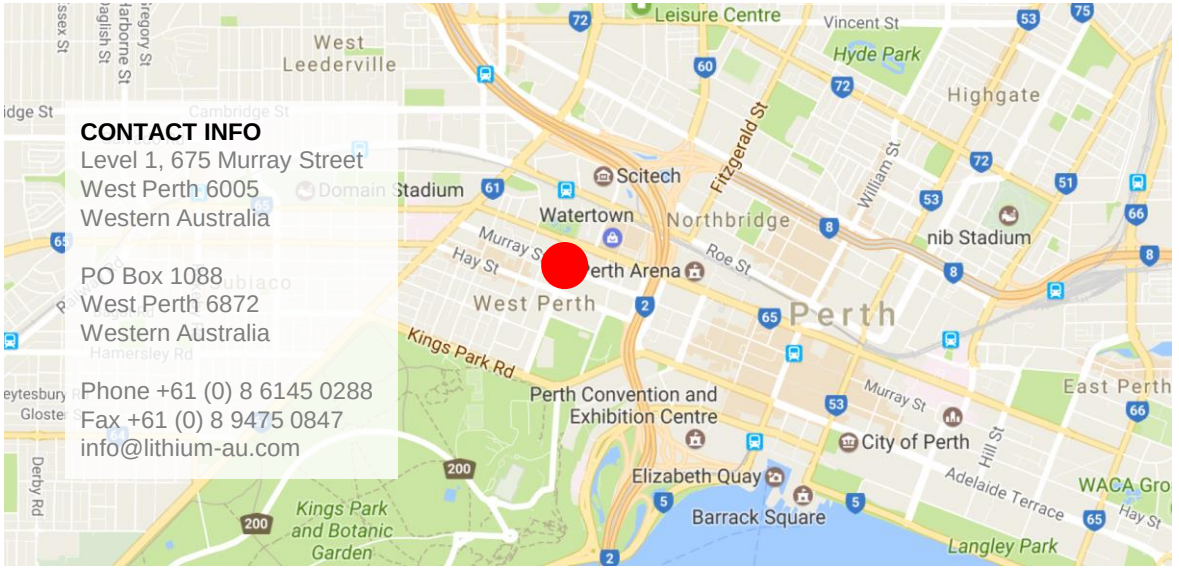
**George Bauk**
**(non-executive chairman)**
Expert in specialty metals, particularly rare earths – project management, marketing and financing.



**Adrian Griffin**
**(managing director)**
Exploration, production, mine management, processing technology.



**Bryan Dixon**
**(non-executive director)**
Corporate, finance, mine development.








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# Lithium Australia's technology and assets

**Lithium Australia aspires to 'close the loop' on the energy-metal cycle.**

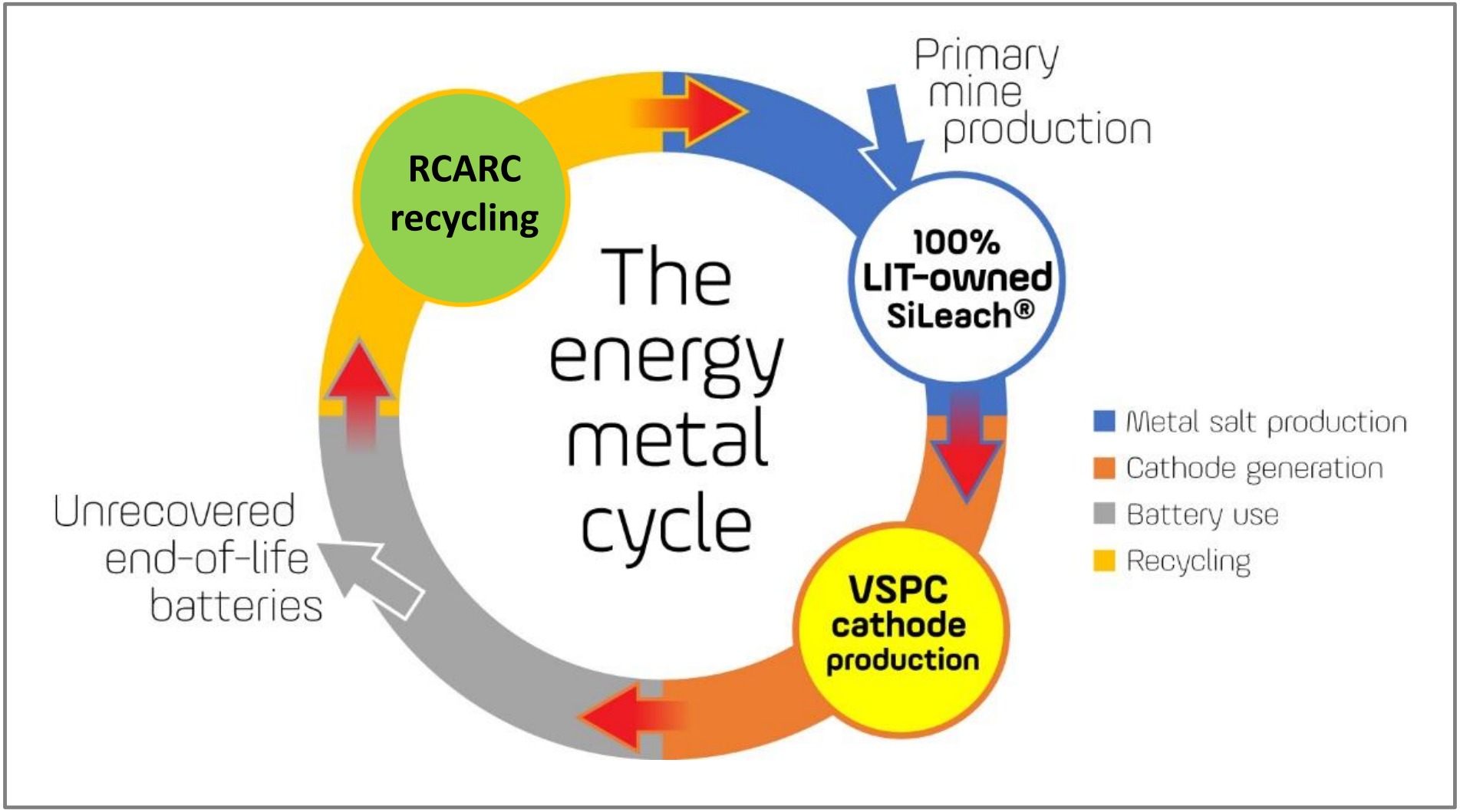
**The principal business units are:**

- **SiLeach®** lithium extraction technology (committed to construction of a pilot plant with a design output of 2500 tpa of lithium carbonate equivalent [LCE]). VSPC compatible.
- **VSPC** (the Very Small Particle Company) technology and pilot plant facilities to produce the most advanced cathode powders. Compatible with feed from SiLeach® and RCARC.
- **RCARC** (Resource Conservation and Recycling Corporation PL) developing processing systems for the recycling of lithium-ion and alkali batteries; output compatible with VSPC
- **Exploration and resource development** covering prospective ground in major lithium provinces of:
    - Australia
    - Europe
    - Mexico



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# The future is about sustainability

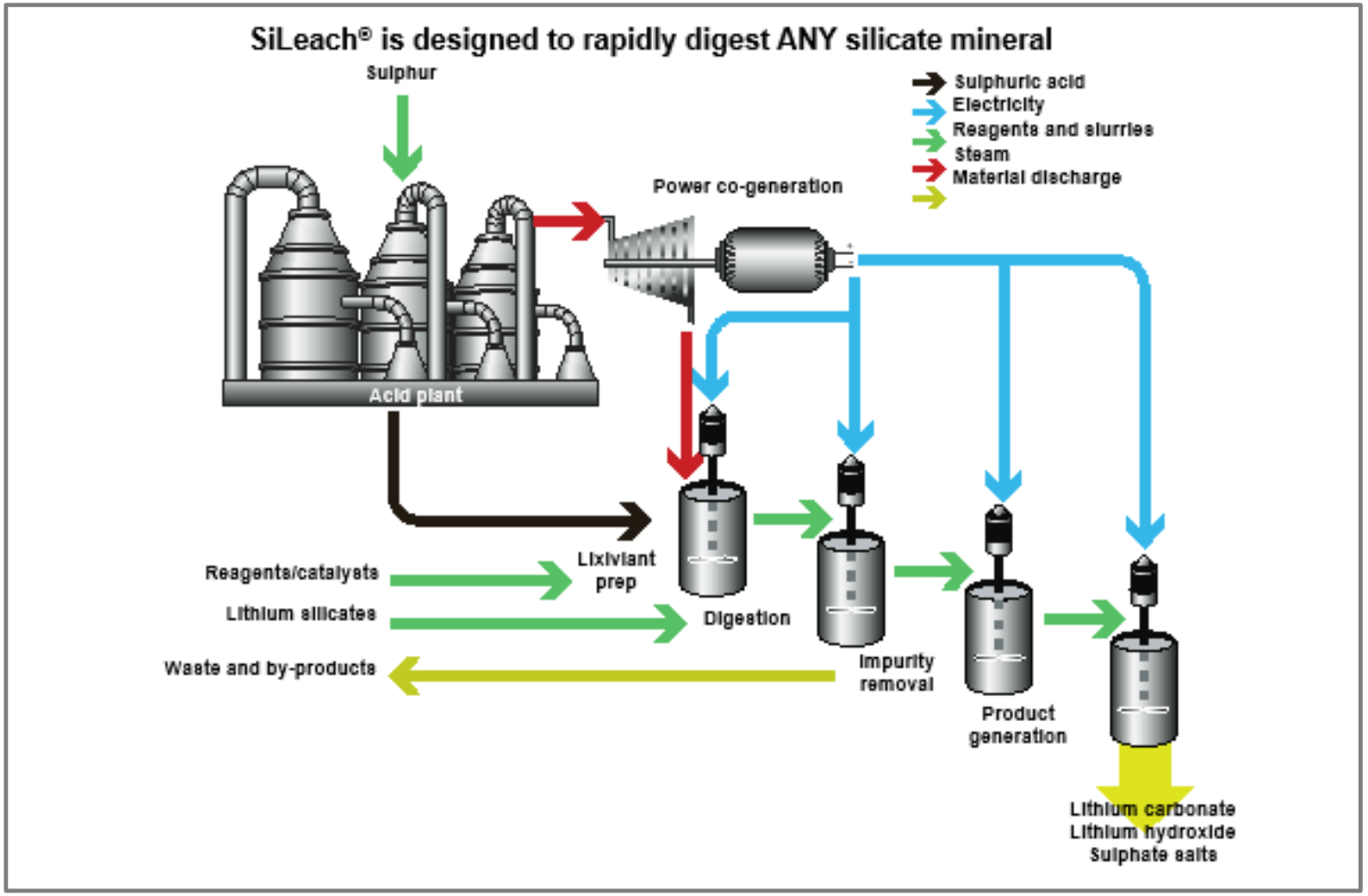




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# SiLeach® - superior processing technology - lithium extraction without roasting

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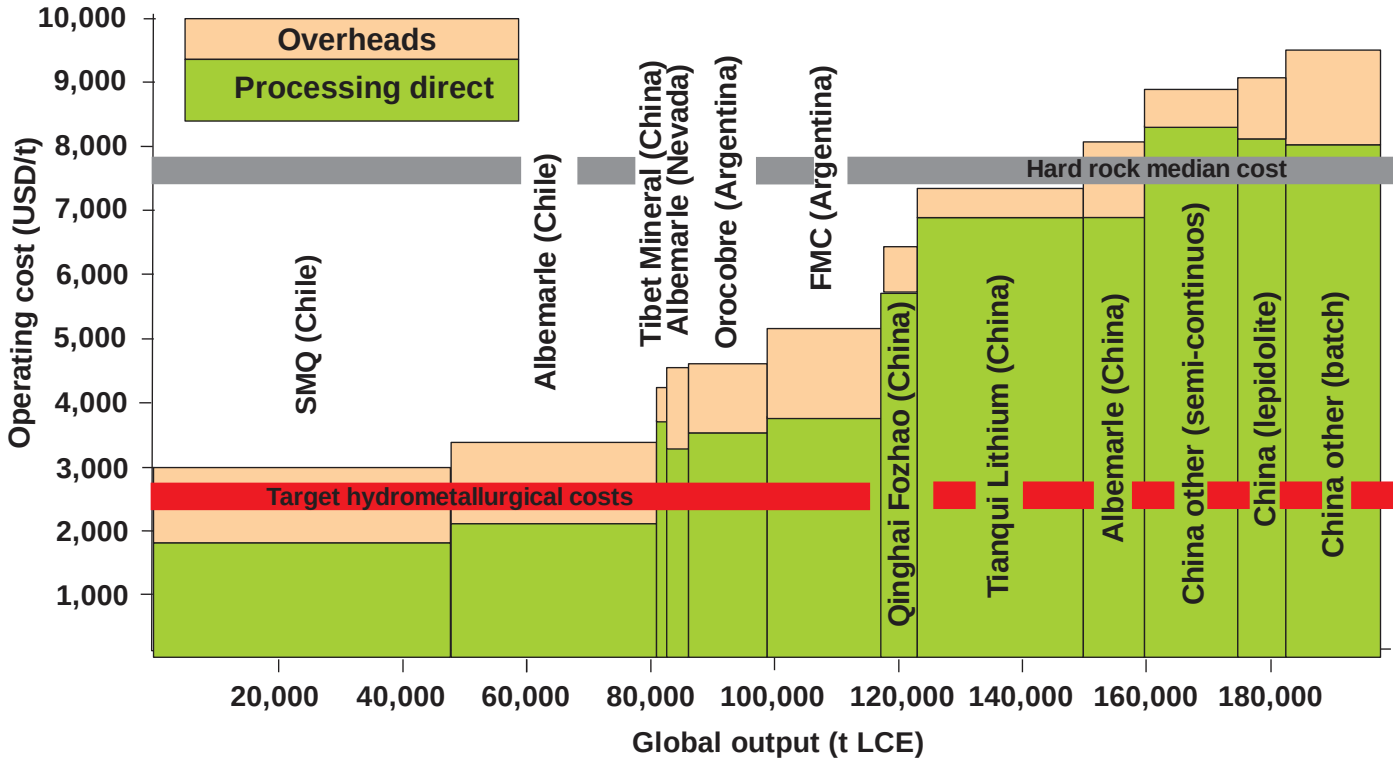



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# The SiLeach® battery-grade lithium chemicals at disruptive cost

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SiLeach® has the potential to change the cost curve for hard-rock lithium production.




Cumulative 2016 production of LCE (t)

**Global lithium carbonate operating costs (after Roskill, 2017) and target hydrometallurgical costs.**



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# SiLeach® Large Scale Pilot Plant (LSPP) first production 2020

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**Location**

- established processing site
- infrastructure in place
- ultilities and services road, rail, electricity, gas, water, sulphuric acid
- co-disposal of tailings



Lepidolite Hill stockpiled ore.

**Lithium mica plant feed**

- locally sourced feed from the Western Australian Goldfields
- crushing, grinding and flotation included in plant design

**Plant flexibility**

- potassium sulphate (fertiliser) circuits to be installed
- silicon, aluminium, and alkaline metal chemicals possible
- LMax® circuits integrated into design

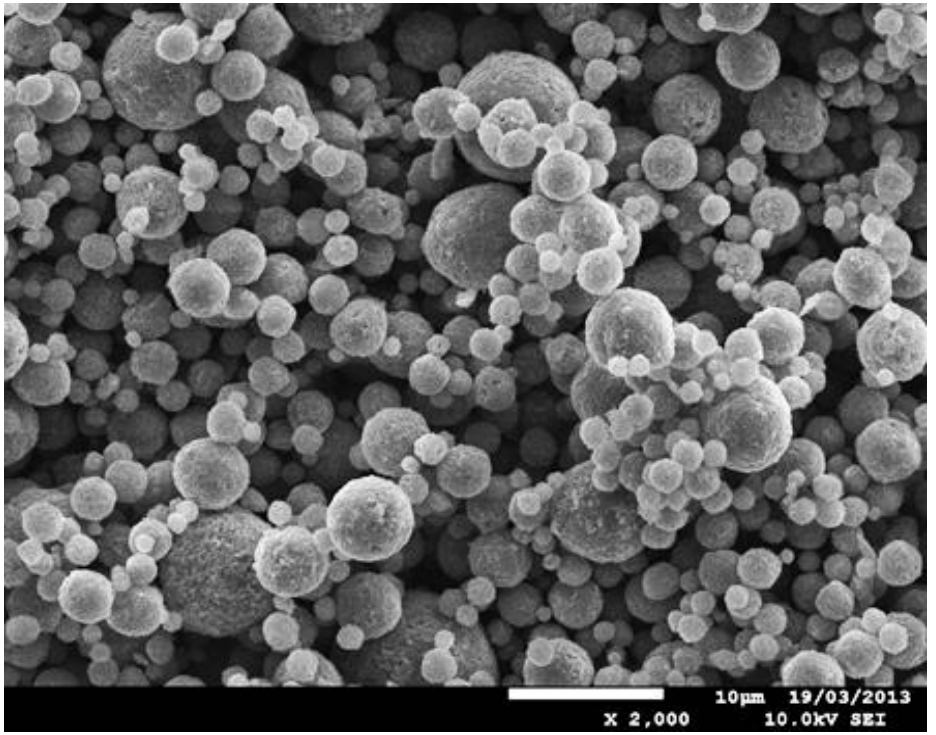


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# VSPC – the superior Li-ion battery cathode

**The Very Small Particle Company (VSPC)**

- wholly owned subsidiary of LIT.
- $30M and 14 years laboratory research and pilot testing experience,
- developed the best cathode powder manufacturing technology available.




**The VSPC advantages:**

- innovative, patent protected,
- delivery of very precise chemistry to complex metal oxides (cathode materials), and
- fast track to commercialization of superior cathode production.
- Cost competitive

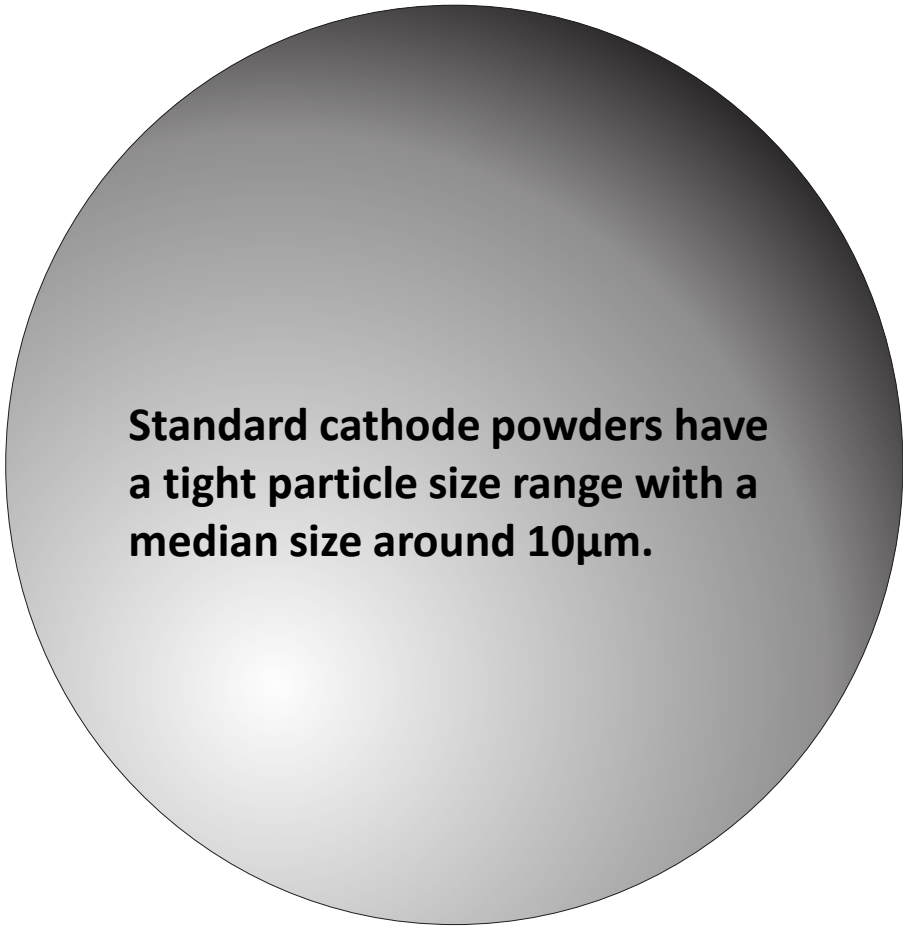
**The VSPC process is compatible with SiLeach® and RCARC**



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# Size matters

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The most advanced powders

Recent advances have seen particle sizes reduced

**VSPC – capable of making powders with a particle size only a fraction of that of its competitors**

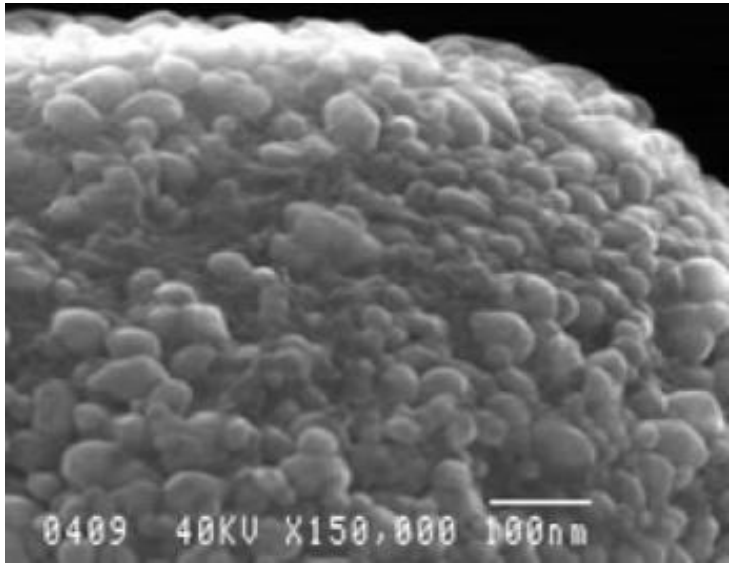


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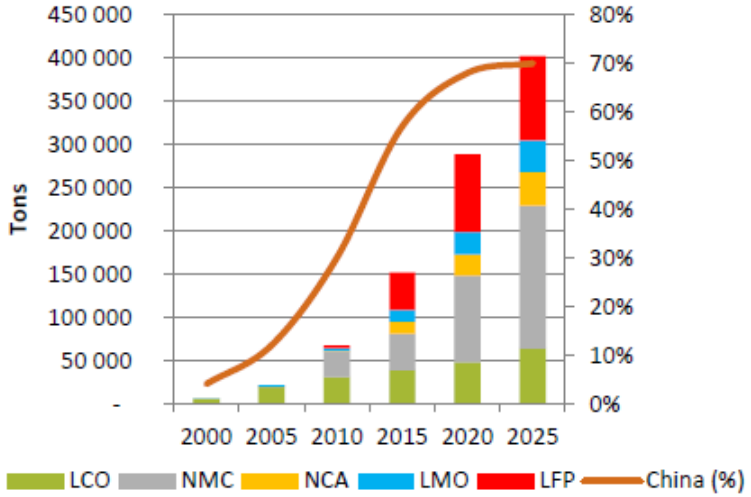
# VSPC vision - high performance - low cost

**Advantages over conventional solid state and hydrothermal synthesis are**:

- Control of primary particle size
- Precise control of material composition
- High efficiency; high recovery and no rework
- Employs conventional process equipment
- Lower energy input
- Adaptable to all Li ion battery chemistries




Cathode active materials
2000-2025 - Tons




Source: Avicenne Feb 2017



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# VSPC Commercialisation Schedule

**2018 Program**

- Restart of Brisbane, Australia, operations — Mar 2018
- Pilot plant commissioning Apr-Jun 2018
- Commence product qualification – LFP — Sep 2018
- PFS for commercial plant, site selection — Dec 2018
- Commence second Product Development — Dec 2018

**2019**

- Negotiate commercial partnerships — Jun to Sep 2018
- DFS for commercial scale plant — Sep 2019
- Commitment to commercial scale project — Dec 2019
- Ongoing product release for customer evaluation





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# Waste ➡ SiLeach® ➡ VSPC ➡ RCARC

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**Lithium Australia is the only company with the technology to transition from mine waste to LIB cathode materials.**







**SiLeach® can generate lithium carbonate from waste materials.**

- 1 t of lithium carbonate = $10,000/t revenue

**VSPC can convert SiLeach® product into the most advanced LIB cathode materials**

- 1t of lithium carbonate = 5 t cathode material
- Each tonne of cathode material = $20 - $35,000 revenue
- Value uplift around 15 fold

**The production of cathode materials provides the highest uplift in the energy metal cycle.**

**RCARC will restart the cycle adding sustainability to the industry and conserving critical metals that are in short supply.**



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# Vertical integration of energy metals

**Lithium Australia is contributing to a sustainable, low-emission lithium future through:**

- world-first, 100% owned technology – **SiLeach®**
- developing the world's best cathode materials - **VSPC**
- full process integration – **RCARC closing the loop**

**Lithium Australia has:**

- the ability to transition from waste materials to cathode powders
- committed to a large scale pilot plant for the SiLeach® process
- commenced recommissioning the VSPC cathode plant
- commenced process development for LIB recycling
- a significant lithium resource inventory to underpin development
- Investment opportunities in all facets of the energy metal cycle



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# Thank you for attending



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