Energy Revolution: Closing the Loop on the Energy Metal Cycle



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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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Lithium Australia (ASX:LIT)

- the path to sustainability

- Energy sustainability is inevitable
- It's just a matter of how we get there
  - ingenuity drives evolution
  - Evolution drives sustainability
- LIT technologies – the evolution required by the battery industry

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Lithium Australia's technology assets

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

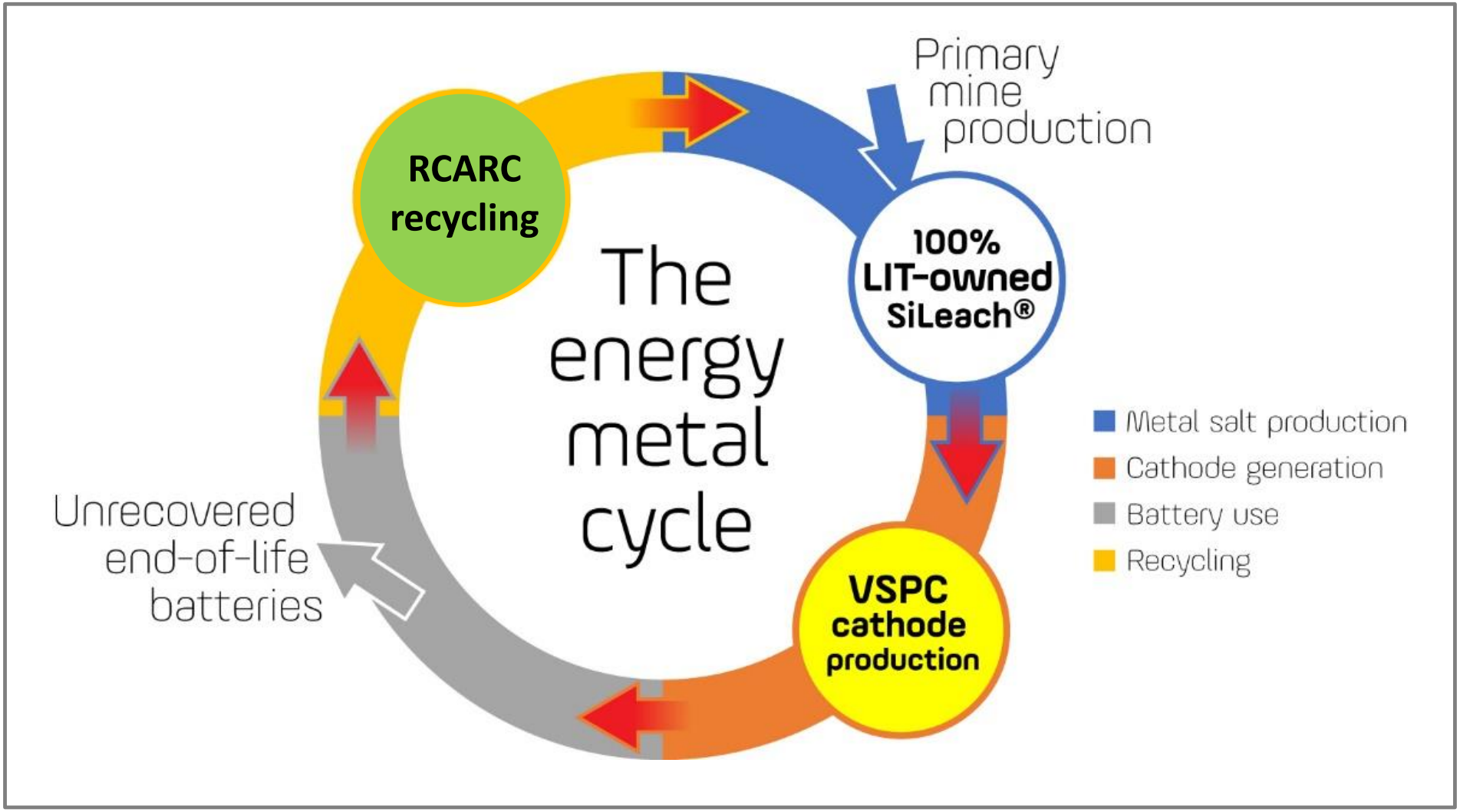
The principal business units are:

- **SiLeach®** primary lithium extraction
- **VSPC** advanced cathode powders
- **RCARC** battery recycling

- The suite of technologies owned by Lithium Australia are the ingenuity required to drive sustainability. Lithium Australia can
  - convert mine waste to battery chemicals **SiLeach®,**
  - Convert the chemicals to batteries **VSPC**, and
  - Recycle the batteries to regenerate the chemicals **RCARC.**

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Sustainability is the future

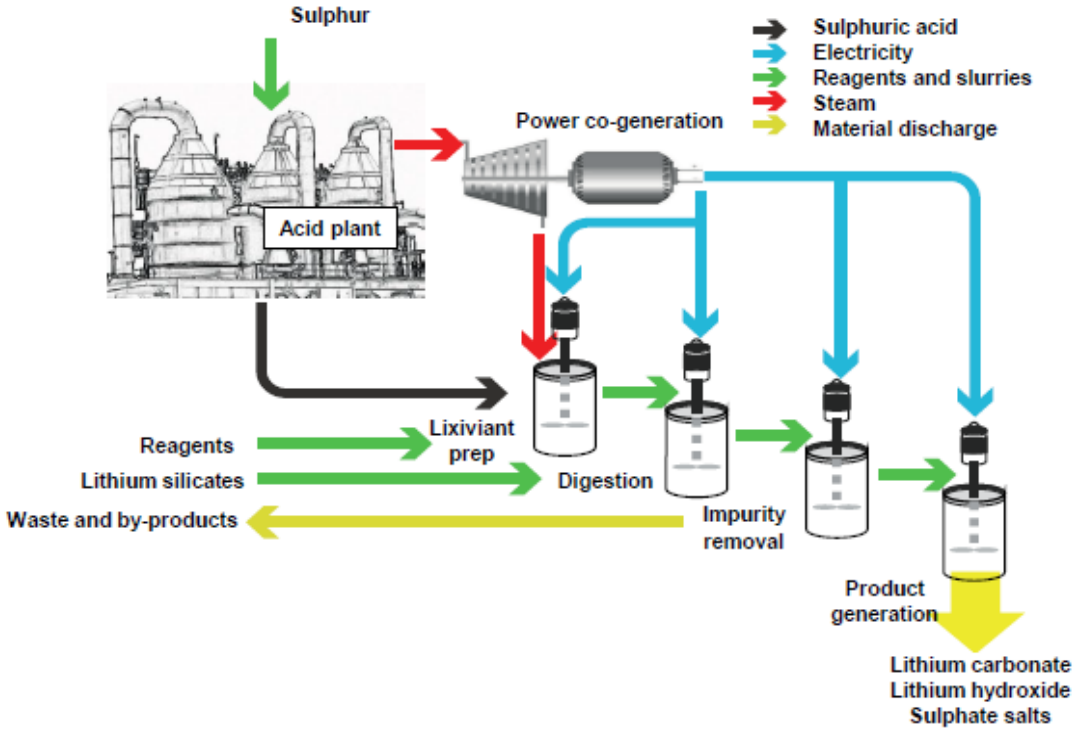


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Lithium Australia's sustainability technologies close the energy metal loop

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SiLeach® - superior processing technology
- lithium extraction without roasting
- mine waste to lithium chemicals



The SiLeach® process

- No roasting
- Low-energy footprint
- Complete dissolution of all silicates
- Diverse by-product credits
- Low operating cost
- Battery-grade chemicals
- Pilot tested

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

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Location

- Eastern Goldfields of Western Australia
- infrastructure in place
- ultilities and services road, rail, electricity, gas, water, sulphuric acid
- co-disposal of tailings



Lithium mica plant feed

- locally sourced feed
- crushing, grinding and flotation included in plant design



Lepidolite Hill (Coolgardie, WA – LSPP feed source)

Plant flexibility

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

*Lithium Australia has exclusive rights to the LMax® process (owned by Lepidico Limited) in Western Australia

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The wasteful society

Lithium Australia NL

Snapshot 2018

- Lithium and cobalt have critical supply dynamics, but still we chose to send expired batteries to landfill
- Lithium-ion battery (LIB) recovery is limited:
  - Less than 10% globally
  - About 3% in Australia
- Recycling in Asia, Europe (minor in North America and none in Australia)
- Nearly all recycling starts with pyrometallurgical processes and no Li recovered

THAT IS ABOUT TO CHANGE

The future is sustainability

Lithium Australia is:

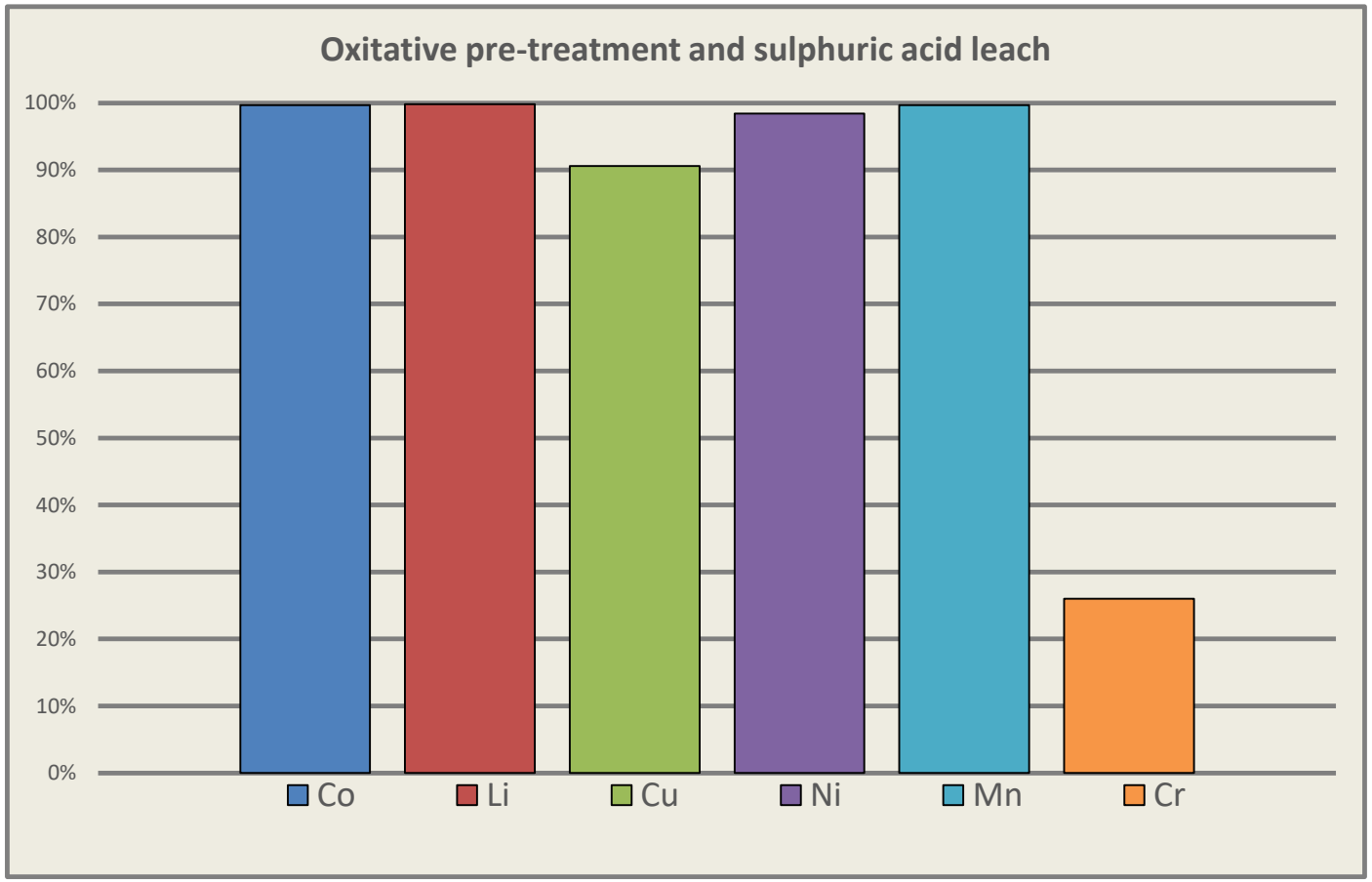
- Developing recycling technology to recover all energy metals
- Creating partnerships to manage the supply chain sustainability
- Providing the path to rebirth batteries

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RCARC – recovery of all energy metals

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RCARC – the first step in cathode re-birth



RCARC employs novel pre-treatment of battery scrap to remove the polymer binders and recover all of the energy metals.

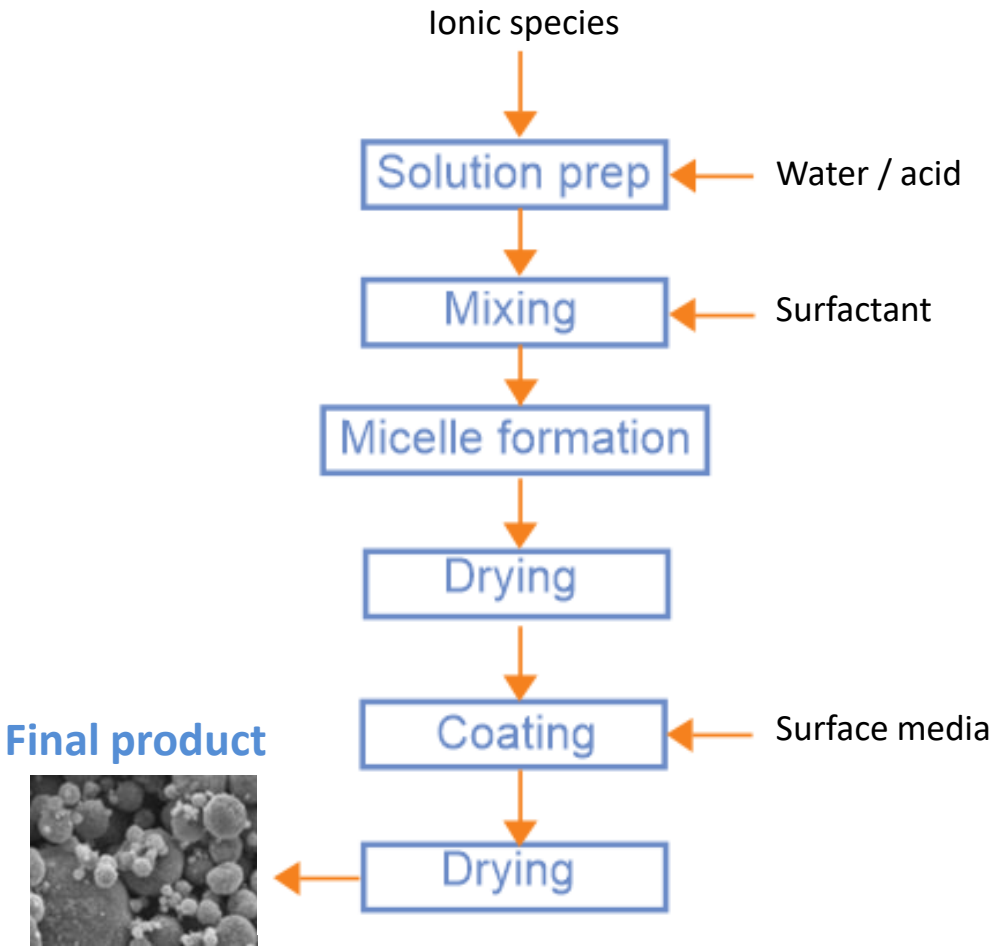
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VSPC – the first step in producing the best lithium-ion battery cathodes

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VSPC – simplicity in nanotechnology

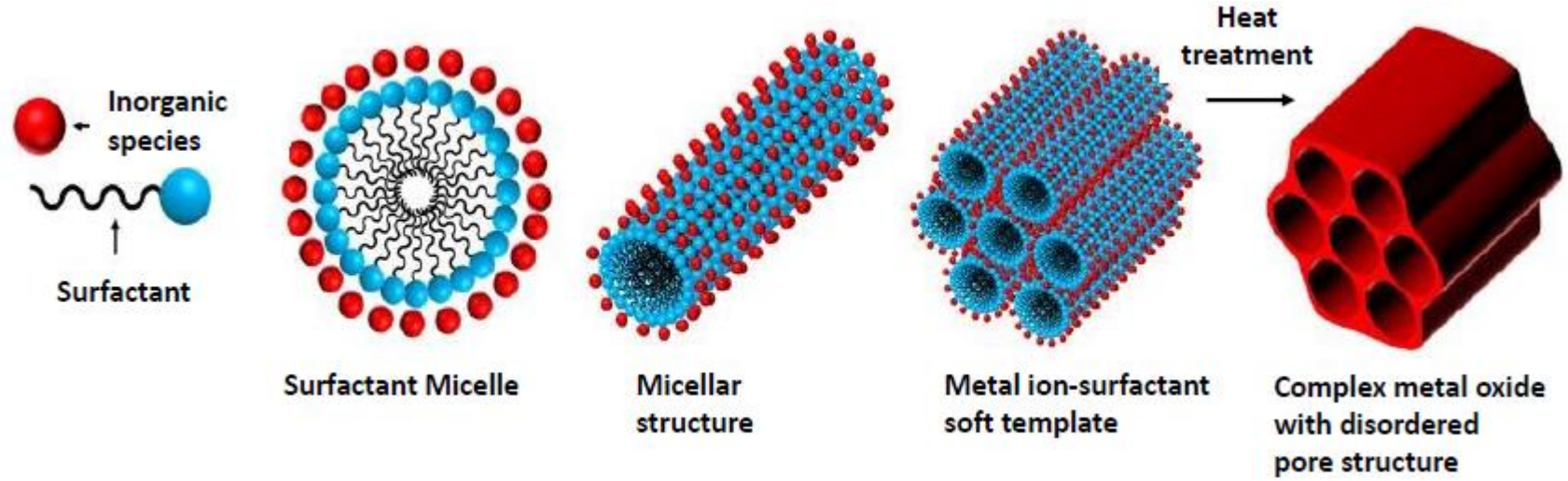
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VSPC's core IP

Formation of nano-scale complex metal compounds, with disordered porous structure using sacrificial, soft templating

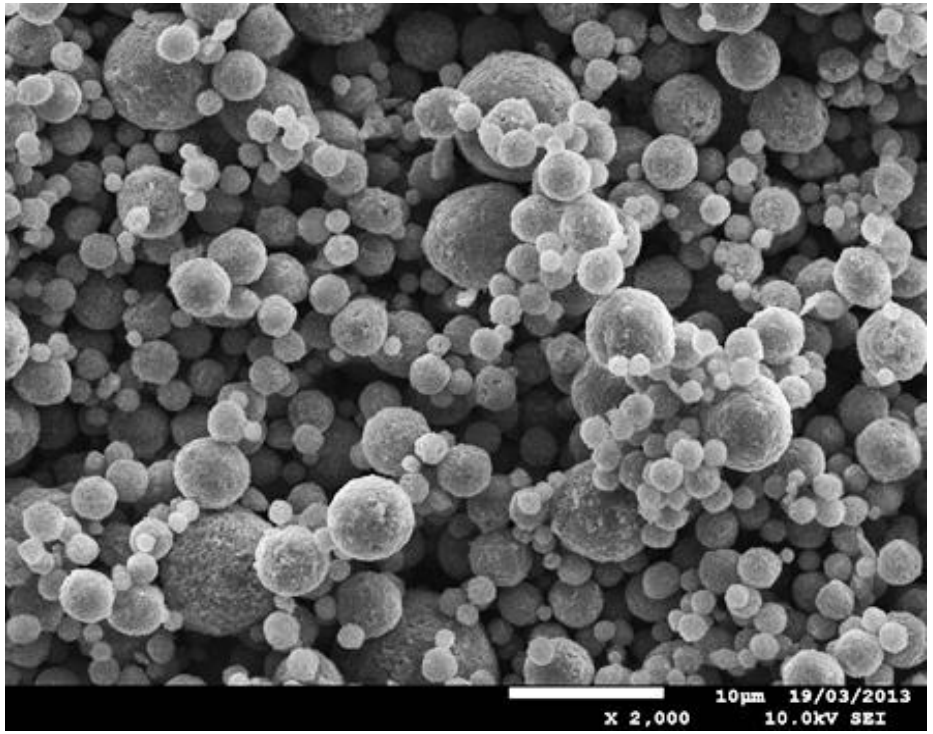


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VSPC vision - high performance - low cost

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 LIB battery chemistries

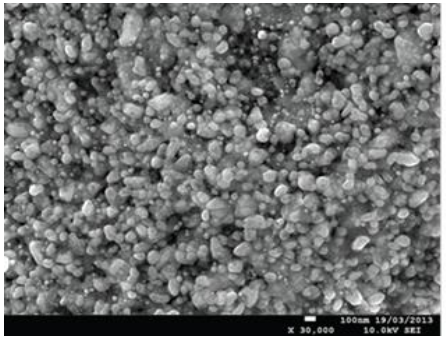
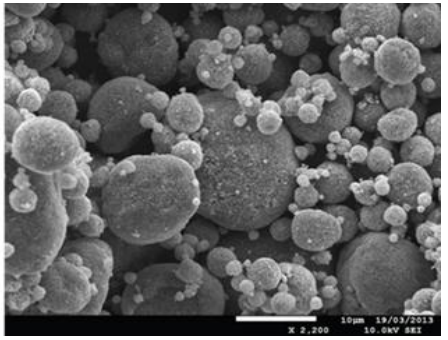


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VSPC Commercialisation

LIITHIUM AUSTRALIA – the only Australian company manufacturing LIB cells from primary materials

- Acquisition of VSPC completed
- Bench scale pilot plant recommissioned
- Laboratory recommissioned
  - Cathode powder being produced
  - LIB cells being produced and tested
- Large pilot plant being recommissioned
- Bulk quantities of cathode powder for end-user endorsement Sep 2018
- Lithium Australia to proceed to DFS in 2019
- Commitment to production facility 2019



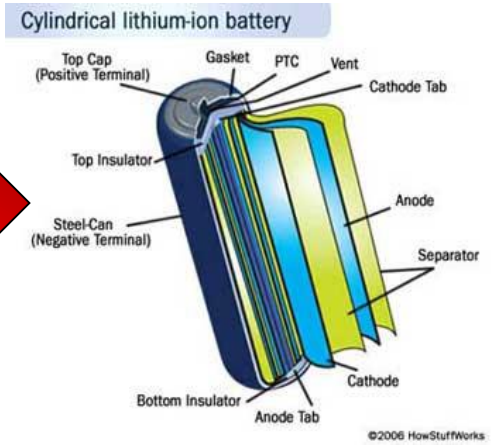
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Waste ➡ SiLeach® ➡ VSPC ➡ RCARC

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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.

VSPC can convert SiLeach® and RCARC products into the most advanced LIB cathode materials

- 1t of lithium carbonate = 5 t cathode material
- 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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Lithium Australia
- energy metal sustainability

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

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

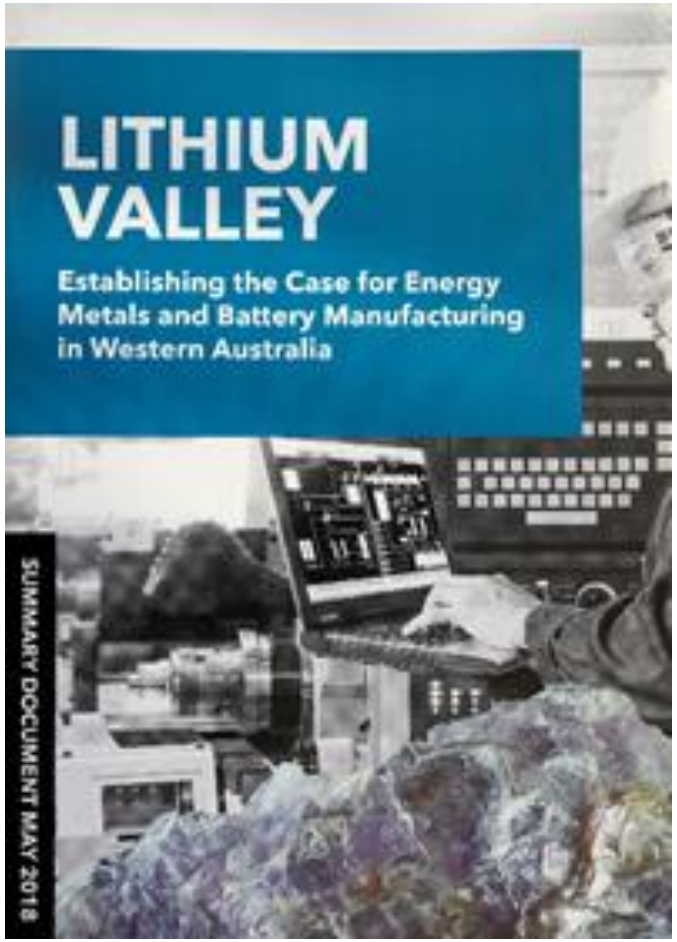
Lithium Australia has:

- 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

*Plant design incorporates integrated LMax® circuits

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Energy sustainability might be inevitable



but we need to make it Australian……..

and the Federal Government needs to buy in.

If we don't move now, energy metals will be in very short supply, and the Australian "quarry" will capture only 1.5% of the current $500 billion revenue stream

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