

# Residential energy storage update

## Plans for market growth underway

### Highlights:

- **Residential energy storage study completed.**
- **Strong financial case for long duration energy storage in the residential renewable energy market.**
- **Technical requirements being addressed to allow domestic VRB use within the Australian energy market.**
- **Further investigation into local manufacturing underway.**
- **Exclusive Dealership Agreement terminated to allow VSUN Energy to market full range of VRB systems.**

Further to the ASX announcements dated 13 April 2017 and 2 May 2017 Australian Vanadium Limited (ASX: AVL, “the Company” or AVL”) wishes to advise that its 100% owned subsidiary, VSUN Energy has reported to the Company its findings relating to the strategic analysis of the residential storage market and VSUN Energy’s potential within it.

The analysis reviewed competitors in the residential energy storage marketplace and found that the vanadium redox flow battery (VRB) has significant points of difference from other forms of residential energy storage such as lead-acid and lithium-ion systems, for example;

- Being more suitable to provide true load shifting by having more hours of storage available,
- Allowing deeper and more frequent cycling,
- Exhibiting a naturally longer lifetime with no performance degradation and
- Being a safer, non-flammable, non-explosive solution.

While a new VRB will have a slightly higher upfront capex, when analysed over their lifespan of 20+ years and with unlimited cycling, the systems show themselves to be a much stronger economical solution for the householder. Costs of VRB systems are expected to decline rapidly as mass production of core components commences.

VSUN Energy has researched current manufacturers of VRB systems around the world and is presently engaged in discussions with a number

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### ASX ANNOUNCEMENT

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#### Projects:

Gabanintha – Vanadium  
Coates - Vanadium  
Blesberg – Feldspar/Lithium/Tantalum  
Nowthanna Hill - Uranium/Vanadium

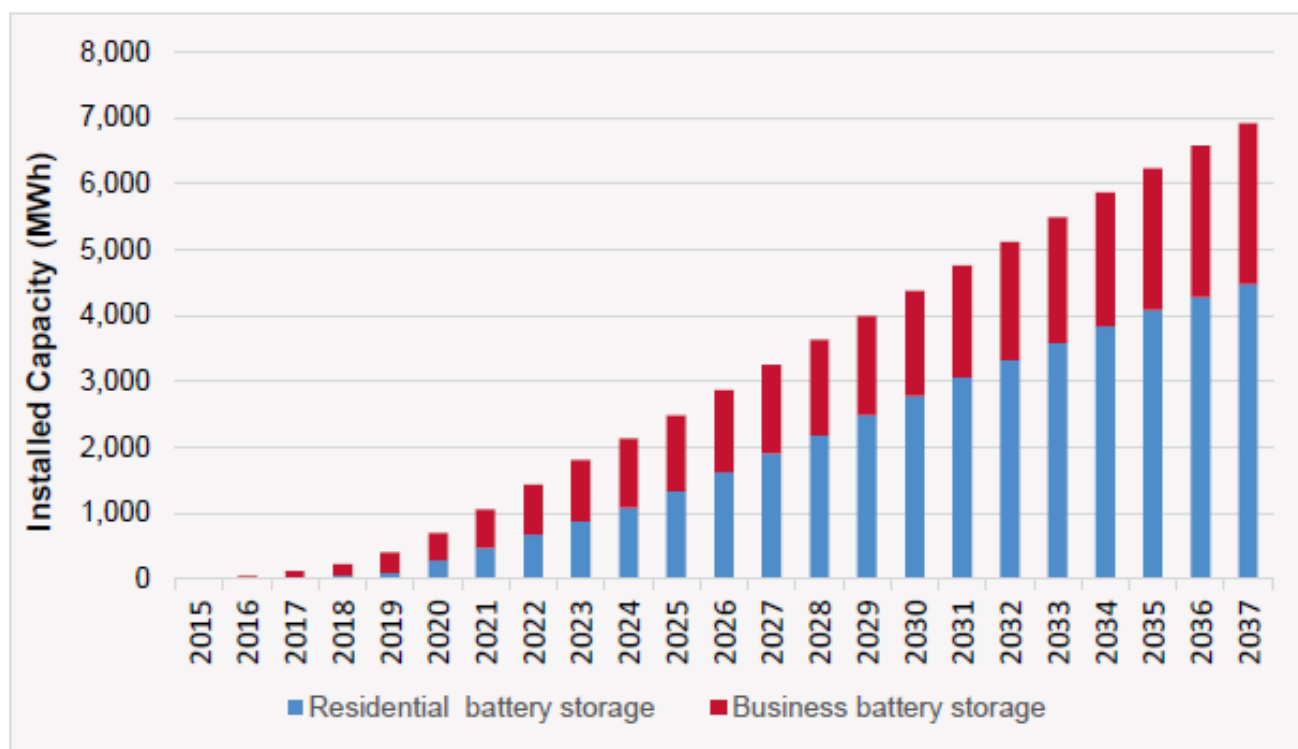


of manufacturers about introducing their products to the Australian energy storage market.

The base model VRB system being considered is a 5kW/15kWh unit, which supplies 5kW of power with 15kWh of energy storage, providing 3 hours at a constant load of 5kW. In typical Australian residential environments, this system will provide 4-8 hours of energy. Other models available include 5kW/25kWh, 5kW-30kWh and 5kW-45kWh systems for small scale commercial and telecoms operations.

Technical requirements relating to the introduction of domestic scale VRB into the Australian energy storage market are presently being addressed, as well as the potential for full or partial local VRB manufacturing and assembly opportunities.

### Market Growth Potential



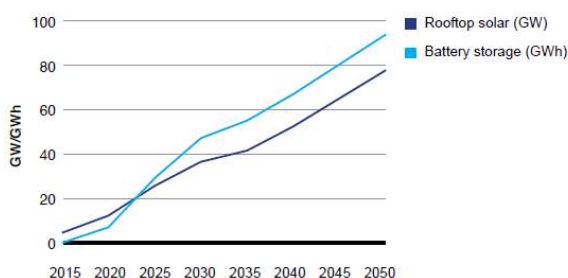
**AEMO: National Electricity Forecasting Report - June 2016**

The residential storage study identified the significance of the Australian residential battery market in the future. This will clearly be a rapid growth market as home consumers look to capture renewable generated energy at its full value rather than relying on ever-decreasing network feed-in tariffs. Increasing network charges, up 200% in the last 10 years, are a constant source of financial concern. High-cycle, multi-hour energy storage systems at the domestic and multi-residential level will have a part to play in the market. The low fire-risk operation and longer life of VRB for energy storage is also likely to appeal to many residential customers.

The charts below from the CSIRO also corroborate the importance of the rooftop PV and residential sectors for energy storage appliances.

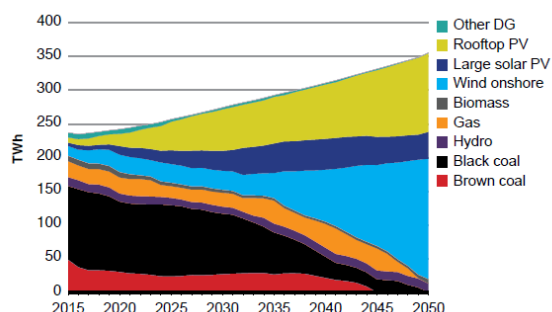
### Rooftop solar and battery storage adoption

Projected uptake of solar PV and battery storage to 2050



### Electricity generation mix

Projection of Australia's changing electricity generation mix to 2050



Source: Energy Networks Australia/CSIRO Electricity Network Transformation Roadmap – Final Report (April 2017)

## GILDEMEISTER Dealership Agreement

In order to advance its domestic scale VRB strategy, the Company is terminating its exclusive dealership agreement with GILDEMEISTER. The dealership imposed a requirement that VSUN could only sell GILDEMEISTER storage systems and only within Australia. That has become restrictive for the growth of VSUN Energy. In addition, GILDEMEISTER does not presently supply a domestic scale VRB system. The termination of the agreement will allow VSUN Energy to market a much wider variety of VRB systems that are currently available globally, from several different manufacturers.

VSUN Energy will continue to market GILDEMEISTER's CellCube brand on a non-exclusive basis.

VSUN Energy continues to market and sell a range of sizes of commercial vanadium battery energy storage systems suitable for business and stand-alone microgrids through to utility scale.

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## About Australian Vanadium Limited

AVL is a diversified resource company with an integrated strategy with respect to energy storage, seeking to offer investors a unique exposure to all aspects of the vanadium value chain – from resource through to steel and energy storage opportunities as well as other energy storage metals exposure through the acquisition and evaluation of lithium/tantalum projects.

AVL is advancing the development of its 100%-owned, world-class Gabanintha vanadium project. The Gabanintha vanadium project is currently one of the highest-grade vanadium projects being advanced globally with existing Measured Resources of 7.0Mt at 1.09% grade  $V_2O_5$ , Indicated Resources of 17.8Mt at 0.68% grade  $V_2O_5$  and Inferred Resources of 66.7Mt at 0.83% grade  $V_2O_5$ , a total of 91.4Mt, grading 0.82%  $V_2O_5$  and containing a discrete high-grade zone of 56.8Mt, grading 1.0%  $V_2O_5$  reported in compliance with the JORC Code 2012 (see YRR ASX Announcement 10 November 2015).

AVL has developed a local production capacity for high-purity vanadium electrolyte, which forms a key component of vanadium redox flow batteries (VRB).

AVL, through its 100%-owned subsidiary VSUN Energy Pty Ltd, is actively marketing vanadium batteries in Australia.

As part of its broader energy metals focus, AVL has also commenced a staged acquisition of a controlling 50.03% interest in the Blesberg Feldspar-Lithium-Tantalum Project in South Africa (see ASX Announcement 21 December 2016).