

Presenter: Rod Henderson Date: 25 June 2021

AMPCONTROL OVERVIEW

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AT A GLANCE







30 Operations across the world

1000+ Employees worldwide

Australian

Owned and operated Head Office in Tomago











6 Member companies

Award Winning Engineering and innovation

AMPCONTROL OVERVIEW

OUR MARKETS

We specialise in the design and supply of complete system solutions with a focus on electrical and control applications



Renewables and Power





Infrastructure





Mining and Resources

Industrial and Commercial

3

Introducing - The LAVO[™] System

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TRUE ZERO-EMISSION, HIGH CAPACITY ENERGY STORAGE



Designed in partnership with the University of NSW

LAVO[™] is a hydrogen hybrid energy generation and storage system that harnesses solar energy to store 40kWh of electricity – enough to power an average Australian household for over 2 days.

The system has been designed in Australia using patented technology to provide zero emission energy independence.

Ampcontrol has provided control and automation design and electrical assembly.





HOW IT WORKS

JUST ADD WATER

LAVO integrates with standard rooftop solar systems and:

- Creates hydrogen from water using an electrolyser
- Stores Hydrogen into a patented LAVO metal hydride
- Converts hydrogen to electricity via a fuel cell and discharge to the family home
- 4. Controls safety, operations and communications via digital control system







HYDROGEN - HYDRIDE

PATENTED METAL ALLOYS

Developed by the University of NSW over a decade to deliver:

- Life span 20,000 cycles of output with minimal degradation
- **Sustainable** the hydride is able to be recyclable \bullet and re-used post expiry
- **Ambient temperature** operation- operates lacksquareunder room temperature
- **High Energy Density** 2-3 times higher as lacksquarecompared to liquefied/compressed hydrogen
- High Safety/Lower operating pressure (30 \bullet bar, similar to a household LPG bottle)
- Metal self-regulates the rate of hydrogen \bullet **release** – this ensures safety at all times









HYDROGEN - COMPARISON

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CREATION OF SAFER STORAGE SOLUTION WITH HIGH ENERGY DENSITY THROUGH HYDRIDE







HYDROGEN POWER - FUELED BY WATER

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	A bucket of water	A bath	Home swimming pool	Olympic Swimming Pool
Litres H ₂ O	10.00	94.60	40,000	2,500,000
Kilograms H ₂	1.11	10.51	4,444	277,778
Mega joules Energy	133	1,261	533,333	33,333,333
LAVO Kilowatt Hours	22	210	88,889	5,555,556
Powering the Average A	Australian Home for:			
days	1.23	11.68	4,938	308,642
vears	0.00	0.03	14	846





DIGITAL - CONTROL

MANAGE THE SYSTEM IN THE PALM OF YOUR HAND

Developed by Evergen, LAVO[™] uses existing technology to optimise person goals

- LAVO[™] app is powered by Evergen to monitor the performance of your system
- Multiple display settings showcase the power generation from your solar system, your home usage, energy storage and connection to the grid
- Owners can select a range of modes to optimise energy storage or economic returns
- Remote performance metrics will identify performance issues and maintenance requirements







KEY - PARTNERS

LAVO has partnered with world-leading industry providers









Australia's leading industrial designer and engineering firm to develop commercial prototype. External design and design lead for mechanical development of the LAVO unit

MECHANICAL DESIGNER



(Netherlands): leading international producer of PEM fuel cells to be integrated into the LAVO system. Assisting LAVO with Fuel cell BOP integration

FUEL CELL SUPPLIER

LAVO - INSTALLED AND ON DISPLAY





The first LAVO unit has been installed on a residential home in Springfield QLD





LAVO on display at the SPARK Exhibition **The Australian Museum**

AUSTRALIA - OFF GRID MARKET



Figure 1 Fringe-of-grid and off-grid areas of Australia

Source: AECOM, ABS



CURRENT GENERATION

75% of that electricity is generated from natural gas **25%** is mostly from diesel fuel

NB: this makes it Australia's most expensive electricity due to the underlying high gas and diesel prices in the remote areas.





500,000 + Australians live in off-grid areas

4.9 GW capacity (8%) **15.8 TWh** consumption (6%)

DOMESTIC - OPPORTUNITY

LAVO has identified \$2.5bn within the Australia market

Our first priority is to deploy our 40KW hydrogen energy storage system across four key segments







287,504 +

Rooftop Solar Installations

- 13.6% growth •
- 2,329,286 total market size

2020 Forecast

- +10% growth
- ~300,000 new rooftop installations

22,661 +

Residential Battery Installations

- 47% growth •
- 48,214 total market size

2020 Forecast

- 40% growth
- ~31,725 new battery installations

FUTURE - APPLICATIONS



Boundary Power Solar Cube





FUTURE - APPLICATIONS

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LAVO BBQ ~ flame free, emission free, portable hydrogen cooktop





FUTURE - APPLICATIONS



LAVO Bike ~ hydrogen powered cargo bike for business deliveries and transport





LARGE SCALE - FUTURE APPLICATIONS

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HEOS ~ 13MW containerised solution of industrial scale green hydrogen





