

Game Changer: The Australian Residential Energy Storage Market to 2021

A Confidential Report for Strategic Research Clients

1.0 Overview

The advent of cost effective distributed energy storage will be a game changer for the electricity supply industry. It will transform how energy is generated, transported and traded by enabling self-sufficient end user micro-grids, fully utilised distribution networks and eliminating wholesale price spikes. The main barrier to date has been the prohibitive cost of energy storage systems.

In this confidential report for our Strategic Research clients, Energeia examines the emerging market for Residential Energy Storage (RES) systems in Australia. The report analyses the market's key drivers, barriers, customer segments, technologies, products and industry players to gain insight into its medium to long-term outlook. Energeia's ten year view covers total investment potential, final costs to the end consumer, and RES' total capacity, offpeak consumption and peak supply potential.

Most RES systems in operation today have been developed for the off-grid market. This means they are designed for a relatively high cost, stand-alone and centrally controlled micro-grid system balancing diesel and renewable based generation. This makes them ill-suited for the much lower cost, pricing signal based, integrated environment of the grid connected market.

Although there is no formal policy or regulatory framework in Australia aimed at encouraging RES, Energeia's review has found few institutional barriers to it exist. The main policy gaps here relative to international best practice are supply side government incentives to build industry capability, demand side incentives to build capacity, and truly cost reflective demand management (DM) incentives. The Clean Energy Futures plan suggests government support will be forthcoming.

Energeia's market analysis has found backup supply, DM and solar PV optimisation as the most prospective RES market segments. The RES market is currently focused on trials and pilots to gain experience with the technology and business model, with only six projects identified globally – three of which are based in Australia. Australia is among the most active of global markets due to the interest here in solutions for edge of grid and bushfire related issues, and for network DM.

Our research has found that the number and performance of commercially available RES systems continues to rise, with costs coming down as production levels increase. Lead-acid remains the low cost leader, but lithium-ion systems appear positioned for longer-term domination on the back of the electric vehicle market. Functional gaps are currently limiting benefits, but Energeia's analysis shows further cost reductions will be required before products become cost effective for most customers.

The key questions facing the RES market are when and where it is likely to become cost effective and whether it will be able to compete against storage alternatives including centralised storage, electrified transport and demand side response. Energeia's analysis of current trends suggest that energy storage will become cost effective in the next five years, and that it is likely to compliment rather than compete with other emerging demand response technologies.

Our market outlook is for rising production and competition to drive an 80% reduction in RES product costs by 2017, mainly in lithium-ion storage and power controllers. Energeia sees the first major RES market opportunity emerging in 2015 in backup supply and network DM niches, with a mass market opportunity emerging a year later. By 2021 our modelling shows 85,000 systems being installed per year with a market turnover of \$350 million.

By 2021, with 412,000 units installed and \$1.7 billion invested, RES will be a formidable electricity market and industry force. Energeia's modelling shows RES accounting for over 4.1 GW of capacity and load, which will supply and consume 2.2 GWh per day. Our view is that this will ultimately drive a transformational shift in the way electricity infrastructure is built and energy is priced – changing the game forever.

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8.0 Glossary

This report uses the following abbreviations:

ACT	Australian Capital Territory
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AIMRO	Advanced Interval Meter Roll-Out
AMI	Advanced Metering Infrastructure
AU	Australia
COAG	Council of Australian Governments
CPRS	Carbon Pollution Reduction Scheme
DM	Demand Management
DER	Distributed Energy Resources
DOE	Department of Energy
EA	EnergyAustralia
EU	European Union
FERC	Federal Energy Regulatory Commission
HAN	Home Area Network
HEM	Home Energy Management
IEC	International Electrotechnical Commission
IP	Internet Protocol
IT	Information Technology
kW	Kilo Watt
kWh	Kilo Watt Hour
LAN	Local Area Network
LI-ION	Lithium-ion
LV	Low Voltage
MCE	Ministerial Council on Energy
MW	Mega Watt
NEEI	National Energy Efficiency Initiative
NSMP	National Smart Metering Program
NSW	New South Wales
PHEV	Plug-in Hybrid Electric Vehicle
PV	Photovoltaic
QLD	Queensland
R&D	Research and Development
RAPS	Remote Area Power System
REC	Renewable Energy Certificates
RET	Renewable Energy Target
SA	South Australia
SAIDI	System Average Interruption Duration
SAPS	Stand Alone Power System
SCO	Standing Committee of Officials
SGIG	Smart Grid Investment Grant
SNC	Smart Network Committee
STC	Small-scale Technology Certificate
STPIS	Service Target Performance Incentive Scheme
TAS	Tasmania
TOU	Time-of-Use
VIC	Victoria
VRLA	Valve Regulated Lead Acid
WA	Western Australia
WACC	Weighted Average Cost of Capital
WAN	Wide Area Network
ZN/BR	Zinc Bromide

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