

Sound and Fury: The Outlook for Australia's Distributed Energy Storage Market to 2025

A Confidential Report for Strategic Research Clients

The Australian storage market has seen a quickening of developments over the past few months with a host of retailer and electricity network trials kicked off, announcements by major local players such as AGL and Origin Energy of planned storage products by the end of the year, and Tesla's halving of the market's lithium battery pricing point overnight.

While all this has prompted the media and equity analysts to announce the imminent arrival of cost effective storage, Energeia's review of the available analysis has found it to be fundamentally flawed in each case. Key shortcomings include neglecting to discount future cash flows, converting costs to Australian dollars, and ignoring real world constraints to theoretical returns. The key question then remains: When will storage truly become cost effective, for whom, and using what kind of solution?

In this confidential report for our Strategic Research clients, Energeia updates and expands its ground breaking techno-economic analysis of the market for Distributed Storage (DS) over the next decade. The number of market segments modelled has increased from 2 to 6, improving our ability to identify opportunities. This report also 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 review of Australia's policy and regulatory policy settings for DS has found that despite having no formal policy or regulatory framework for DS, few institutional barriers exist to wide scale storage deployment. ARENA has stepped up to fund the capability developments needed to catalyse the early market, and the AEMC has just announced its own storage focused review. Our analysis shows the main regulatory barrier to be the lack of truly cost-reflective tariffs.

Although we see near-term demand from network and retailer spending targeting government and regulatory funding from ARENA and the Demand Management Innovation Allowance, we expect this to collectively represent a few hundred units at most. While renewables integration and demand management will both be important niches, we see demand over the next 3 to 5 years coming from a few key customer segments with the right conditions to unlock the most value from storage services.

The range of available storage solutions has increased significantly since our last report, with the majority of new units designed to drop into an existing solar PV circuit to reduce system costs by sharing the inverter. Unfortunately, solution developers have yet to fully understand DS economics, and none of the units provide a cost effective solution due to some combination of functional and cost gaps. The emergence of bolt-on software solutions may help address current functional gaps.

While the industry is rapidly expanding, most of the growth is in product manufacturers and suppliers and not in storage service providers. Product market concentration is low, with only Sunverge's solution winning more than one trial at this stage. Storage chemistry concentration is another story, however, with all trials featuring some kind of lithium-ion solution.

Energeia's modelling shows cumulative Australian DS market investment of \$300 million and annual installations reaching 55,000 nationally across residential and commercial segments by 2025. While some of this demand will come from existing solar PV customers looking to leverage their investment, the vast majority of demand is expected to come from those customers with the right kind of load profile and those able to access a truly cost reflective retail and network tariff.

Energeia's latest research report dispels the sound and fury of the current crop of would-be storage players, solutions and strategies as ultimately signifying nothing with respect to the main \$300 million opportunity. Instead, we see the ultimate winners as those whose strategic positioning best reflects the fundamental economics of storage.

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The arrival of cost effective storage in Australia has been a hot topic in the electricity industry in recent years. Two recent ‘breakthrough’ announcements by global electric vehicle darling Tesla, and a reinvigorated, distributed energy focused AGL have sent shockwaves through Australia’s storage industry.

Since our last report in 2013, in which we forecast cost effective battery solutions being offered by 2015 to niche customer segments, lithium based battery system availability has taken off, but the price of these systems remained stubbornly high – until Tesla’s announcement in May 2015 rocked the global storage industry with cost per kWh pricing for lithium as low as \$350/kWh. Since then, manufacturers and suppliers have been scrambling to compete, and prices have begun to fall.

What has not been so well understood in the media melee following Tesla’s announcement is the limitations of the system Tesla is offering relative to the requirements of a cost effective storage solution. Tesla’s product currently lacks the functionality needed to capture most storage service revenue in Australia, making it uneconomic despite its market leading cost per kWh price tag.

The other potentially key market development has been AGL’s announcement of their storage solution, which like Tesla’s, at first appears to be a watershed event for the Australian market for storage. And while it certainly is for AGL, and potentially other first-tier energy retailers who have yet to offer a storage product, storage has been offered by off-grid specialists for years, and lithium products have been offered by solar PV suppliers and specialists since before our last report.

Like Tesla, AGL’s selected product also lacks key functionality needed to address most storage benefits in Australia. Its high price tag, nearly double the price of Tesla’s solution, means that AGL’s positioning strategy is likely to limit sales beyond the 2.5% of early adopters that are driven by factors other than price and return on investment.

Energeia’s own analysis of these issues and identification of market ‘leader’ beating strategies is laid out in this report, which updates our view of the key:

- Financial benefits of storage services in Australia
- Customer segments with the highest storage service revenues per customer
- Functionality and performance of systems needed to capture these revenues
- Products available in Australia representing the greatest value for money
- Player strategies and business models adding long-term shareholder value.

The following sections in this chapter describe the specific scope of this report and summarises its structure.

1.1 Scope

This report is part of Energeia’s Strategic Research service, which focuses on the emerging energy technologies that will power the Customer of the Future. The report addresses the market for distributed energy storage over the next ten years and the industry value chain that will develop, manufacture, distribute and service the various products.

While we see significant potential opportunities for utility scale renewable energy project attached storage solutions and distribution network attached storage solutions, the scope of this report has been limited to customer premise installed distributed solutions, again to give greater focus to what we see as the key emerging market opportunities in Australia.

The scope of battery storage technologies considered in this report is limited to lead acid and lithium-ion as the two most prospective storage technologies over the next decade. While we believe that flow

and potentially heat based storage systems could become viable over the next ten years, we have excluded them from this report to give greater focus to the more commercial technologies.

Due to their relative market size, the report focuses on the main Eastern markets of Queensland (QLD), New South Wales (NSW), South Australian (SA) and Victoria (VIC). National figures, and those of other key states, are also included where it is practical to do so.

1.2 Definitions

Distributed energy storage refers to an energy storage device that is located on a customer's premise and behind the customer's meter. It includes the necessary hardware and software to transfer energy between the system and the premises, including the switchgear, power inverter, battery charger, system controller, communications and enclosure. It may be centrally or locally controlled.

1.3 Structure

The report is structured into the following main sections:

1. **Overview** – Provides a high level summary of the report and its key findings
2. **Introduction** – Outlines the scope and structure of the report and provides technical definitions and assumptions
3. **Policy and Regulation** – Reports on Australia's policy and regulatory framework as it relates to energy storage technology at the Federal and state level against international best practice
4. **Customers and Markets** – Reports on the Australian market for energy storage devices, including the estimated size, profile and potential of key market segments
5. **Products and Services** – Reports on distributed energy storage products and services, including an assessment of their functionality and performance against market requirements
6. **Industry and Strategy** – Reports on the industry value chain by segment including key challenges and opportunities, the number and type of players, and player strategies
7. **Outlook** – Reports on Energeia's proprietary models and outlook for policy and regulation, energy and product pricing, market demand, products and services and industry value chain.

Sections 3 through 6 provide the results of Energeia's research and analysis of historical and contemporary information. Section 7 is forward looking, and mostly concerned with describing the key inputs and assumptions underpinning our twenty year outlook.