Unlocking the Value of Community-Scale Storage for Consumers

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Contents

Introduction and Summary

Introduction

Declining battery costs and a continued focus on power sector decarbonisation are driving investment in energy storage in Australia. The Australian Energy Market Operator (AEMO) has stated that "the most pressing need in the next decade … is for dispatchable batteries, pumped hydro or alternative storage to manage daily and seasonal variations in the output from fast-growing solar and wind generation." Their 2022 Integrated System Plan (ISP) estimates that 15 GW of storage capacity will be online by 2030 and 61 GW by 2050. More than half of this storage capacity is expected to come from distributed resources.

Most of Australia's installed storage capacity thus far has been from transmission-scale batteries. Adoption of household battery storage paired with rooftop solar is also growing rapidly. In this study, we explore the relative advantages of a third type of storage project: **community-scale storage**.

Community-scale storage has the potential to combine the scale advantages of large storage projects with the network, resilience and direct consumer benefits that can only be achieved from distributed projects. The Commonwealth Government has allocated more than $200 million to deploy 400 community-scale batteries across Australia via the ***Community Batteries for Household Solar*** grants program. The Victorian Government's $10.9 million Neighborhood Battery Initiative (NBI) also supports the uptake of community-scale batteries.

In light of these developments, Energy Consumers Australia commissioned The Brattle Group to help understand the opportunities and challenges to maximise the value of community-scale storage projects for consumers. **Our study estimates the net benefits that community-scale storage can provide to consumers, identifies barriers to community-scale storage deployment and adoption, and establishes options for overcoming those barriers.**

What is community-scale storage?

A community-scale battery is larger than a household battery and smaller than a grid-scale battery. It can be located in a public area such a local park or be connected to a particular facility such as a school or shopping centre. Community-scale storage has the potential to combine the scale advantages of large storage projects with benefits that can only be achieved from distributed projects.

Features of community-scale storage:

- Battery with typically between 100 kWh and 1,000 kWh of energy storage capacity
- Often designed to support a few hundred homes and businesses downstream of the battery
- Directly connected to the distribution system; also can serve bulk system
- Includes a variety of ownership models (e.g., subscription-based, utility-owned)

EXAMPLES OF COMMUNITY-SCALE STORAGE PROJECTS

- **Ausgrid**: Three batteries around Sydney and Lake Macquarie, each with 230 to 270 kWh of storage capacity. The trial aims to deliver cost savings and support the uptake of solar power.
- **United Energy / Simply Energy**: 40 unique 30 kWh batteries on power poles, to serve roughly 75 homes. Focused on improving reliability in constrained low voltage distribution networks.
- **Yackandandah**: 274 kWh battery installed with solar behind-the-meter to meet the community's renewable energy goals and provide backup power.
- **Yarra Community Battery Project:** 284 kWh battery trial to demonstrate commercial viability and to investigate community ownership.

Scope of study

The purpose of this study is to…

- Highlight the critical role that energy storage will play in Australia's future power system
- Explore the relative advantages and disadvantages of different types of storage projects
- Identify challenges and barriers that may prevent the value of community-scale storage projects from being realised
- Propose opportunities for maximising the value of community-scale storage projects, given the growing focus of policy on promoting community storage projects

This study does *not*…

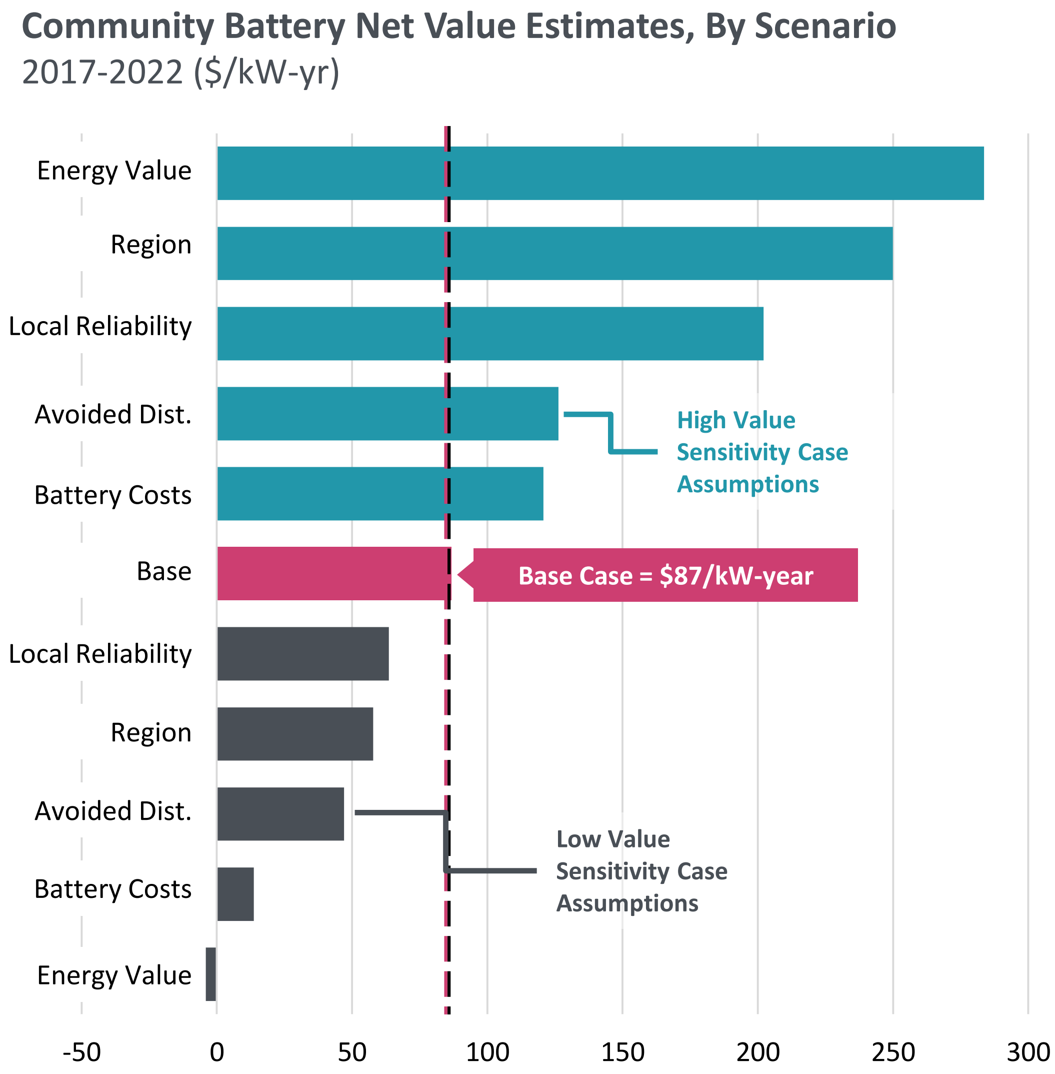
- Advocate for community-scale storage as the uniformly preferred form of energy storage in Australia
- Propose community-scale storage ownership models or take a position on the role of networks in owning batteries
- Determine the viability of any individual battery project; analysis is based on average costs and system conditions
- Assess the economics of household battery ownership from the perspective of the participating household; economic analysis is from a power system perspective
- Indicate overall cost-effectiveness of storage projects; the focus is on relative advantages of different storage project types

Key findings: The potential value of community-scale storage

Community-scale storage has the potential to provide significant economic benefits to Australian energy consumers. The potential of community-scale storage results from realising the cost savings of larger-sized batteries with benefits that only can be achieved from distributed resources.

Achieving this potential is not guaranteed. It requires community-scale storage to locate in particular parts of the network that need storage the most. It also requires the ability to fully monetise the value that consumer energy resources and community-scale storage bring to the system.

To realise the potential of community-scale storage, the installed costs of projects must also decrease. While all battery storage costs are projected to decrease in the future, effective trials and deployment can facilitate these cost reductions.



Key findings: Advantages and challenges of community-scale storage

Advantages of community-scale battery projects

Relative to transmission-scale batteries…

- Can defer distribution system capacity investments
- Can provide local reliability (if configured to serve downstream load during an outage)
- Can increase solar PV hosting capacity

Relative to household batteries…

- Can leverage diversity in household energy use profiles to provide similar benefits at lower total installed capacity
- Can take advantage of economies of scale to reduce cost per unit of installed storage capacity

Challenges of community-scale battery projects

Community-scale batteries typically …

- Are more expensive than transmission-scale batteries
- Are more challenging to design and deliver than household batteries
- Are a less mature product, with a less established delivery chain
- Must monetise a value stack that is fragmented across multiple entities
- Have benefits that vary significantly by location

Key findings: Barriers and potential solutions

We identified three key barriers and solutions through interviews with key industry stakeholders.

REWARDING BATTERIES FOR THE VALUE THEY PROVIDE

Community-scale batteries – and Consumer Energy Resources (CER) more generally – are not rewarded for all the value they bring to the energy system.

SOLUTION: Community-scale batteries and CER should be able to participate in a capacity market or investment scheme. Time-varying and location-specific network tariffs can reward responsive consumers and distributed resources for the value they bring to the network.

IDENTIFYING THE BEST LOCATIONS

While many parts of the distribution network would benefit from storage, there is limited public data about which specific locations would provide the most value.

SOLUTION: Distribution networks could publish data and maps identifying the areas of the network that would most benefit from community-scale storage.

BUILDING A LOCAL INDUSTRY

Community-scale storage is an emerging technology with a less established delivery chain. High costs for design and development can have a major impact on overall project economics.

SOLUTION: Use grant programs to support building local industry in each part of the supply chain needed to deliver community-scale storage solutions tailored to the Australian market at low cost.

More barriers and further recommendations are discussed later in this report.

The Value of Community-Scale Storage

The potential benefits of community-scale storage

Community-scale storage can provide a range of benefits to consumers, the network, and the energy market.

Energy System Benefits

- Participation in the wholesale electricity market and ancillary services markets
- System stability through voltage support

Benefits for Customers of The Storage Project

- Optimised time-value of consumption and exports
- Solar soaking
- Customer utility from using community-scale storage that is not priced in the market
- A platform from which the wider community can engage with the electricity market

Network Benefits

- Peak demand reduction
- Improved network reliability
- An alternative to network investment
- Support for EV infrastructure

Meeting Policy Goals

- Emissions reductions
- An opportunity for Australia to develop and lead a novel application of energy storage technology

Note: Market services benefit battery customers through market revenues, and all customers through lower electricity prices. Similarly, network services benefit all customers through potentially lower network charges.

We compare the potential value of community-scale storage to two other storage options

Analysing the relative economics of community-scale storage, transmission-scale storage, and household storage provides an indication of the relative advantages of each.

Household Storage

Small-scale (e.g., 5 to 30 kWh) battery located on-site (behind the meter) of individual homes.

Often deployed to provide backup power and to improve the value of rooftop solar, they can be operated to provide energy system benefits as well.

Community-Scale Storage

Mid-sized (e.g., 100 to 1,000 kWh) distribution-connected battery.

Deployed to serve downstream local community and also to provide services to the broader upstream energy system. While these are “community-scale” batteries, they may be sponsored or owned by any entity.

Transmission-Scale Storage

A large-scale (e.g., 100 to 1,000 MWh) transmission-connected battery.

Provides bulk-system value by participating in wholesale energy and ancillary-services markets.

We analyze the benefits and costs of each storage option from a societal perspective

The societal perspective is a different – and more holistic – view of net benefits than that faced by an individual household.

Societal Perspective

The perspective commonly considered by policymakers when determining how to allocate resources for the betterment of society

- Captures value to society of each storage option without considering how benefits and costs accrue to individual stakeholders, such as specific householders or developers.
- Ignores transfer payments such as rebates, subsidies, and other incentives.

Example: A household customer's storage investment results in reduced energy system costs. A societal assessment examines the storage investment and the impact on energy system costs but ignores whether/how the latter results in bill savings for the customer who installs the storage.

FOCUS OF THIS STUDY

Consumer/Developer Perspective

The perspective a consumer or developer takes when investing in a storage system

- Considers benefits and costs incurred only by participants, including intrinsic non-monetary benefits
- Does not consider the costs incurred by a utility or other entity.

Example: The consumer perspective would compare a household's storage investment cost to the household's bill savings from storing and later consuming what would otherwise be excess solar output to avoiding paying the retail rate.

A note about the economics of household storage

Investment decisions of individual households in battery storage can be very different than the societal business case.

Households that own batteries can store energy from solar panels and later use that stored energy to avoid paying the retail price for grid power. Because the retail price includes fixed network costs, avoiding the retail price can sometimes mean that owners of household batteries do not pay for their full contribution to network costs. Further, if the household does not face cost-reflective, time-varying price signals or their battery does not participate in a Virtual Power Plant, they do not have an incentive to operate the battery in a way that maximises energy system cost savings.

Information barriers and transaction costs further influence household storage investment decisions. Additionally, the intrinsic and non-financial values that some consumers associate with on-site generation resources can factor into the decisions as well.

For these reasons, from the individual consumer's perspective the economics of household storage can be more beneficial than the estimate of societal value quantified in this study. From a policy standpoint, changes that enable community-scale batteries to earn more revenue should also be consistent with policies regarding household batteries and other consumer energy resources.

Modelling methodology

We simulate the optimised dispatch of the three battery options relative to forecasts of marginal system costs to estimate their potential net benefits to society. Additional details can be found in the technical appendix.

Benefit category	Transmission-scale storage	Household storage	Community-scale storage	Discussion
Energy	✔	✔	✔	Simulated optimised dispatch using 2017-2022 market prices, assuming batteries are operated to maximise hourly value.
FCAS	✓	✓	✓	Not modelled due to expected future market saturation from competing storage projects, and general uncertainty in forecasting ancillary services prices.
Capacity	✓	✓	✓	Not modelled due to uncertainty related to emerging Capacity Investment Scheme.
Avoided distribution investment		✔	✔	Distributed batteries can discharge during peak times and defer the need for grid upgrades. Modelling based on long-run marginal cost in DNSP tariff.
Local reliability		✔	✔	Distributed batteries can serve downstream customers during system interruptions, avoiding or reducing distribution outages. Modeled using public SAIDI data and AER's VCR value.
Reduced solar curtailment		✓	✓	Distributed batteries can increase distributed solar generation output through reduced curtailments. Not modelled due to lack of data.
Voltage support		✓	✓	Distributed batteries can provide system stability through voltage support. Not analysed due to modelling complexity, similar to other studies on battery value in Australia.
Intrinsic Customer Value		✓		Household batteries provide customers greater control of their systems and exclusive access to an energy source during outage events. Not modelled due to wide range of estimates.
Total benefit	✔	✔✔	✔✔	Distributed storage captures more value by "stacking" multiple value streams and providing reliability and T&D deferral in addition to energy market value.
Battery cost	$	$$$	$$	Larger batteries cost less per kWh of storage than smaller batteries due to economies of scale. Cost data sourced from National Renewable Energy Laboratory (US) which provides more detailed estimates than publicly available Australia-specific data.

✔ modeled   ✓ considered but not modeled

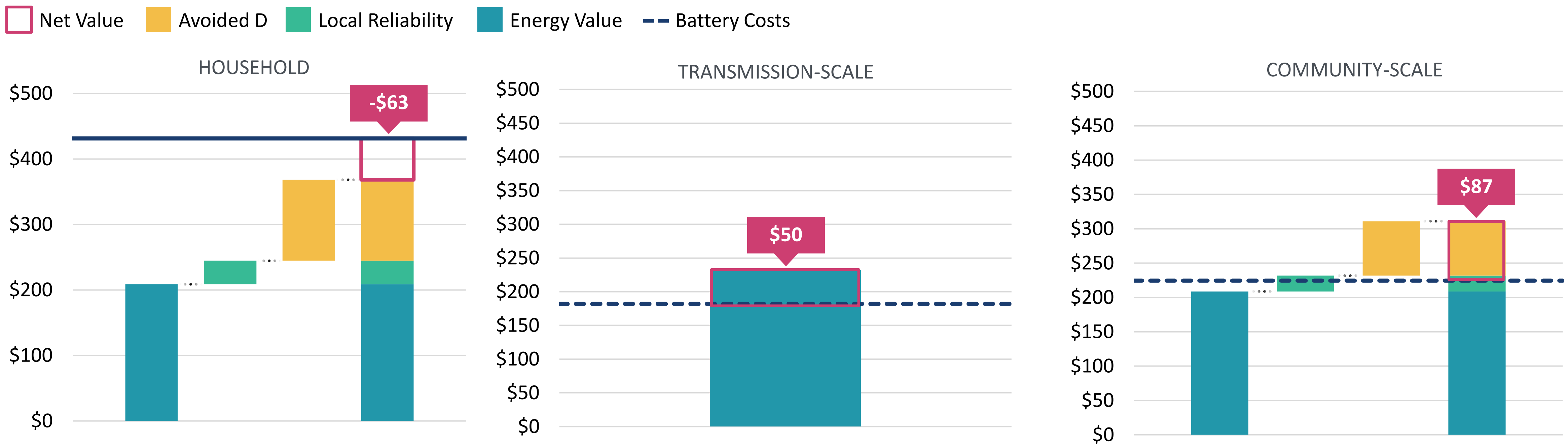
Community-scale storage could provide the largest net benefit of the three storage project types

Household storage can stack multiple value streams and provides the largest benefits per unit of capacity. However, the cost often is significantly higher than the other options.

Transmission-scale storage provides slightly more energy value than the other storage options, because dispatch is not withheld to provide other services.

Community-scale storage could provide significant net value by stacking multiple value streams while also achieving economies of scale. This finding depends on being able to accurately locate community-scale storage projects in high-value locations on the grid and monetise the value they bring.

Storage Value Stack ($/kW-Year)



Notes: Results shown are a weighted average across all states. For explanations of each value stream, see the Technical Appendix.

Variability in the energy value of storage

Energy is the single largest source of value in our modelling for all three storage options. It represents the value of charging during lower-cost hours and discharging during higher-cost hours.

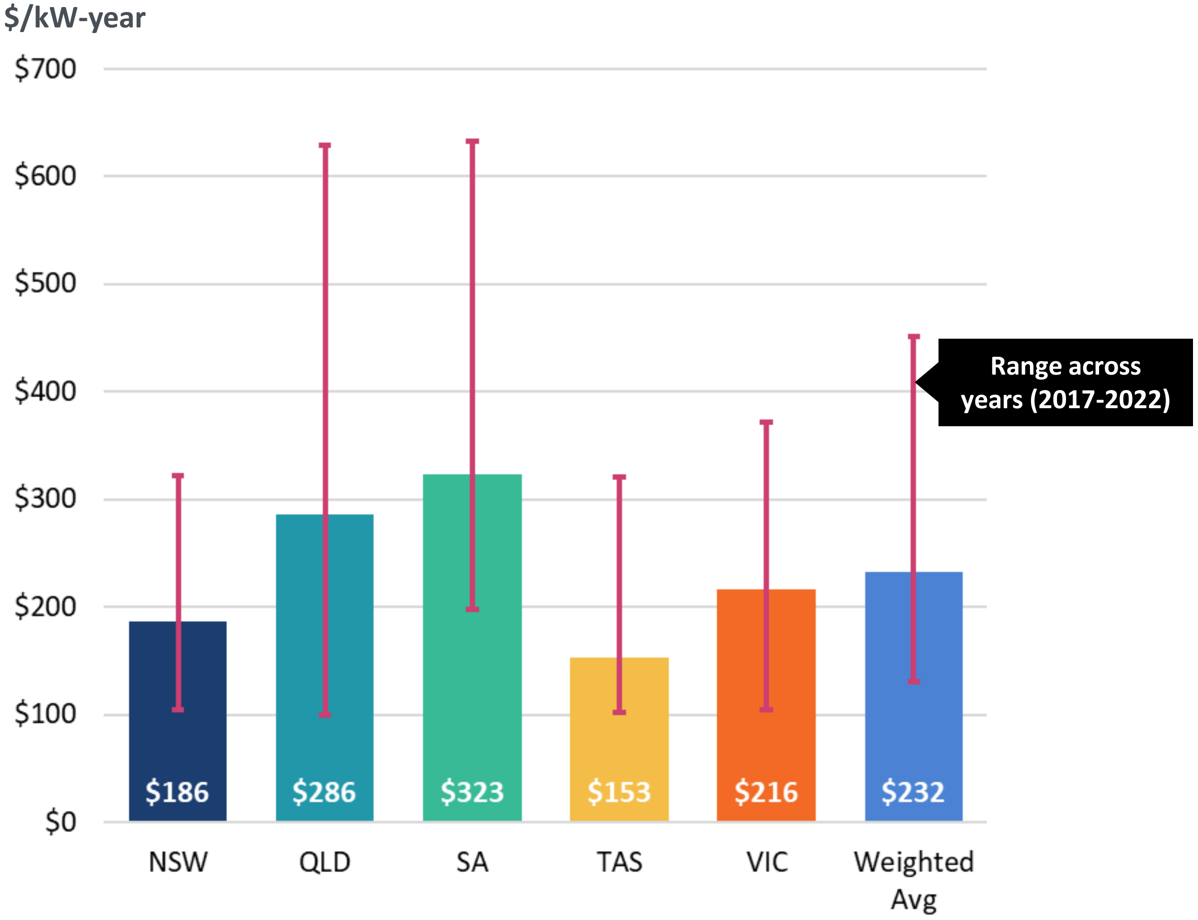
Our estimates of the energy value of battery storage vary considerably across locations and historical years.

Recent modifications to the energy market and atypical weather conditions led to higher storage energy value estimates in 2021 and 2022, due to higher and more volatile energy prices.

The economics of transmission-connected storage depend the most on the energy value. Community-scale and household batteries provide additional value by being located closer to demand and helping to avoid or defer distribution network costs.

Historical 4-hour Battery Average Energy Value

2017-2022 ($/kW-yr)



Note: Ranges represent the years with the highest and lowest energy value estimates between 2017 and 2022 for each state. Solid bars are the simple average of energy value across those six years.

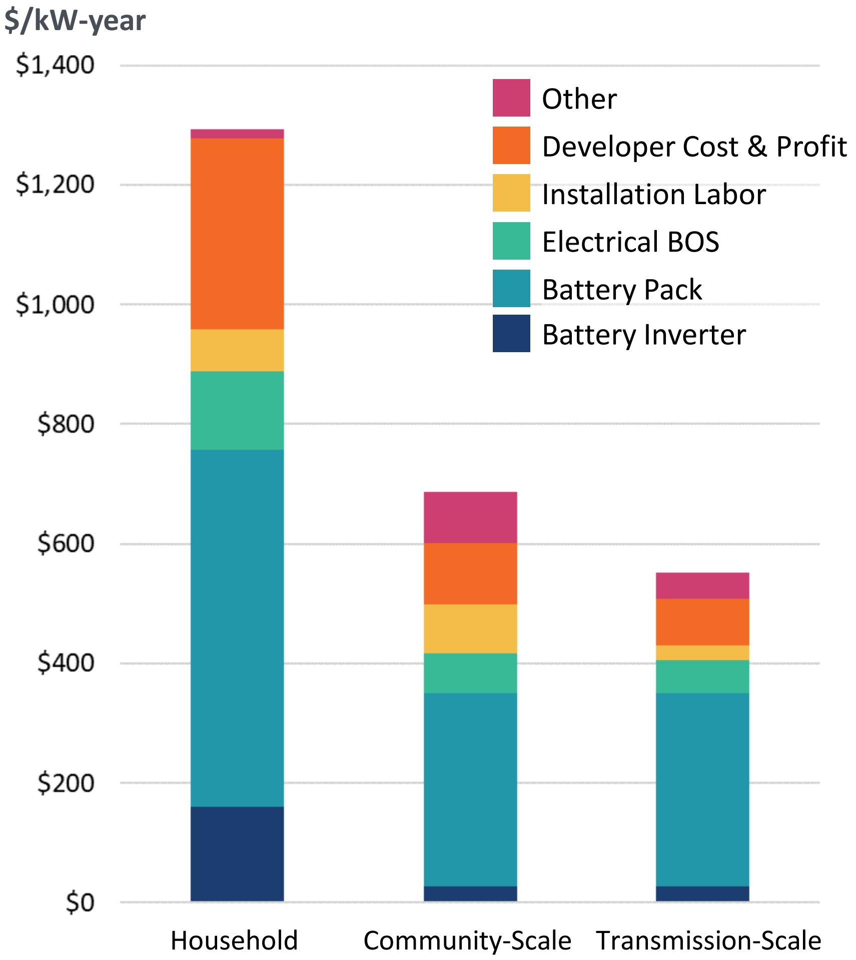
Storage costs

Household batteries are more expensive per-kWh than larger community and transmission-scale storage. This is because economies of scale reduce the cost of battery components for larger assets. Higher residential costs also stem from developer mark-up and costs.

We assume that storage costs in Australia are roughly comparable to those found in US cost estimates.

- For each battery size, public estimates provide a wide range of costs. Residential and community-scale batteries have a particularly wide spread, depending on final size of installation, inverter size, and battery manufacturer. Often, battery systems are paired with solar, further complicating cost estimates for standalone batteries and installation.
- For consistency in comparing costs across the three storage options, our cost estimates are based on NREL's Annual Technology Baseline (ATB). The ATB uses a bottom-up cost model that accounts for major components, including the battery pack, inverter, and the balance of system (BOS) needed for the installation. Household battery costs are adjusted downward to reflect lower soft costs in Australia than in the U.S.
- Additional investments in distribution automation would be necessary in order for community-scale batteries to provide local reliability value. In the base case, we reduce local reliability benefits by 50% to approximate the incremental investment that would be needed to enable those benefits.

2022 Battery Capital Cost Estimates
(2022$ AUD for 4hr Storage)



Sources: Energy Sage, Solar Choice, Clean Energy Reviews, NREL ATB

Sensitivity analysis

Community batteries provide positive net benefits across 9 of the 10 sensitivity cases analysed in this study.

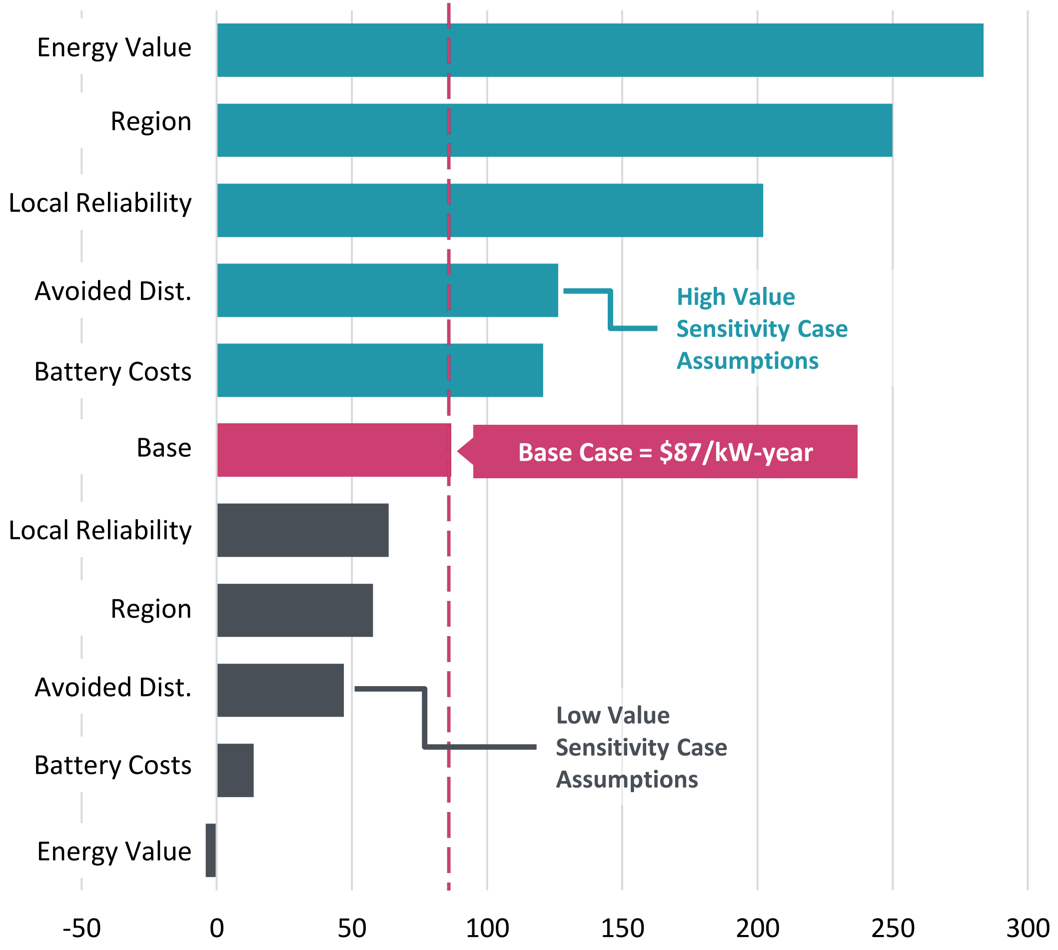
Year-to-year changes in energy prices are the biggest driver of variation in our estimates of the net value of community-scale storage. There is more financial upside potential than downside risk due to more extreme events and weather years.

The value of local reliability and avoided distribution is heavily location dependent. The value of community batteries will be maximised if placed in areas of the grid where there is high congestion or high outage frequency. Ultimately, community batteries are more economic than transmission-scale batteries if their local reliability value and distribution cost savings outweigh the cost advantage of larger, transmission-connected batteries.

There is currently a high level of uncertainty in storage capital markets due to high battery demand and constrained raw material pipelines.

See technical appendix for further detail on the sensitivity cases.

Community Battery Net Value Estimates, By Scenario
2017-2022 ($/kW-yr)



Conclusions of community-scale storage value assessment

Our analysis set out to assess the relative costs and potential benefits of three storage project types: community-scale batteries, transmission-connected batteries, and household batteries.

We simulated the benefits of the three storage options using recent data on NEM energy prices and system costs. Our simulations accounted for tradeoffs that must be made by the battery operator when simultaneously pursuing multiple sources of value.

Based on our analysis, community-scale storage has the *potential* to provide significant economic benefit to Australian energy consumers, by combining the cost savings of larger-sized batteries with benefits that only can be achieved from distributed resources.

However, realising these benefits will require overcoming significant barriers that currently exist for community batteries.

KEY FEATURES OF VALUE ASSESSMENT

Simulations accounted for limited battery operator foresight into future market prices and system conditions.

10 sensitivity cases were conducted to determine the robustness of findings relative to uncertainty in modelling assumptions.

Analysis was performed across 5 states and 6 years to capture a range of Australian market conditions.

Barriers to Community-Scale Storage Deployment

Emerging perspectives on barriers and solutions

We conducted interviews with industry experts to identify barriers preventing achievement of the full value of community-scale storage, and to inform our range of recommendations for overcoming the barriers.

The interviews focused on questions such as:

- What are the most important opportunities or use cases for community-scale storage in the near term and in the long term?
- What are the biggest barriers preventing community-scale storage from being deployed and adopted?
- What are the most attractive options for addressing the barriers and why?
- Why aren't these options already implemented? What needs to happen to implement those solutions?

We thank experts from the following organisations for participating in our interviews:

AGL

ARENA

Ausgrid

DEECA

Energy Consumers Australia

Energy Policy WA

Essential Energy

SA Power Networks

Synergy

Tesla

Total Environment Centre

Key barriers to realising wider energy system benefits

Market services

The design of capacity schemes

Community-scale storage projects bring important capacity (resource adequacy) to the system, providing a dispatchable source of energy needed when demand is high or supply is low. The Capacity Investment Scheme's current design excludes projects below 30 MW, preventing community-scale storage from monetising this value they can provide to the system.

FCAS revenue

While FCAS is a potential source of revenue, it is unclear whether FCAS would contribute substantially to the business case for community batteries. The FCAS market may quickly become over-supplied as new resources are enabled to provide FCAS. Another concern is that FCAS participation itself can be costly (i.e., transactions costs).

Battery costs

Physical battery costs

Batteries remain more expensive than the market expected a few years ago. The rise in the cost of raw materials is leading to a slower decrease in battery prices over the long term. Other factors may also be putting pressure on prices, including supply chain constraints and suppliers and installers not fully passing supply-side cost savings onto end customers.

Battery development costs

Community-scale batteries are less common outside of Australia and the UK, including in the larger US market, meaning that they are less targeted for R&D investment. Much more investment is being made in developing other battery types (EVs, household-scale and utility-scale).

Community engagement

Insufficient community engagement

Targeted education is needed to maximise community benefits from the design and operation of community-scale batteries. Many community groups lack the knowledge and resources to meaningfully engage in a discussion about the benefits of community-scale storage. Engaging communities requires time and money, which can strain project economics.

Community agency

Community-scale batteries can also be a platform to engage the community in the energy transition, bringing wider benefits as communities learn more about the energy system and make more informed decisions. These benefits are difficult to quantify and may not provide a direct financial benefit, but are still important and worthwhile.

Key barriers to realising network benefits

Peak demand reduction and an alternative to network investment

Community-scale batteries can help to smooth peak demand, by discharging when demand is high thus reducing the need for investment to increase network capacity upstream of the battery.

- Data is important to demonstrate feasibility and quantify value streams by proving that the battery can provide a valuable network service in a particular location. Without DNSP data, it is difficult to develop a business case.
- A community-scale battery would not be installed solely for EV charging as the value-add would not be sufficient. However, the battery could help to meet the demand for EV charging. This additional support for EV infrastructure is only valuable if community-scale batteries are located in areas with network constraints where EV charging stations would otherwise not be feasible.
- Currently, there is no way of monetising network services unless there is an agreement between the battery owner and the DNSP (for example because network tariffs are not location-specific).
- Community-scale batteries are not always cost-competitive with larger-scale projects. Deployment costs are a higher factor of overall costs for a community-scale project compared to a transmission-scale project. There are considerable land costs and project approval costs in terms of both time and money for community-scale projects. These costs contribute to a lack of industry capacity to design and develop community-scale projects.

Network-owned community-scale batteries now have more regulatory support following the AER's decision to temporarily waive ring-fencing restrictions. In the long-run, non-network businesses may provide the innovation required for community-scale batteries to realise their potential, but for such businesses to flourish, networks could share more data and insight about where batteries are best located to resolve network constraints.

Network reliability

Community-scale batteries can prevent blackouts if part of a microgrid and can reduce the likelihood of blackouts by providing voltage services to the wider grid. This value is important, but difficult for potential project participants to estimate if they are unaware of how many outages are prevented or how often they are prevented through the contributions of community-scale batteries.

Key barriers to realising other potential benefits

Time-value of consumption

Improved tariff design leads to more optimal system design and therefore lower overall costs which translate to customer bill reductions. If tariffs are not optimally designed, energy consumption will not be incentivised at the right times to maximise societal value. Specialised or bespoke tariffs could facilitate the viability of community-scale batteries in many locations.

Solar soaking

Solar curtailments are substantial in some locations, resulting in "waste" of low-cost, carbon-free electricity. Whether or not community-scale batteries should provide a solar soaking service depends on their size, configuration, and the degree of curtailments in a given location. Currently, the data available to quantify this value stream is limited.

Emissions reductions

The inclusion of emissions reductions in the National Energy Objectives (NEO) emphasises the value of community-scale batteries being able to integrate more distributed renewable energy into the grid. However, the cost of emissions is not fully internalised into the price of electricity, so maximising commercial value will not maximise emissions reductions.

Overcoming the Barriers

Overview of three key priorities for moving forward

These three focus areas will be highly influential in enabling the successful, sustainable implementation of community-scale batteries in Australia.

01

Rewarding batteries for the value they provide

Community-scale batteries and Consumer Energy Resources should be rewarded for the value they provide to the energy system. They should be able to participate in a capacity market or investment scheme. Time-varying and location-specific network tariffs can reward responsive consumer and distributed resources for the value they bring to the network.

02

Identifying the best locations

Distribution networks could publish data and maps identifying the areas of the network that would most benefit from community-scale storage. Non-network businesses face significant barriers to innovate in the sector unless all market players have equal access to insights about where batteries are most needed.

03

Building local industry

Funding agencies can emphasise opportunities to deliver enduring benefits to consumers by building a sustainable local industry for community-scale batteries. The ultimate success of community-scale storage may depend on the ability of local industry to reduce design and delivery costs.

Key priorities for moving forward

Monetisable Benefits of Storage

Benefit category	Transmission-scale storage	Household storage	Community-scale storage
Energy	✔	✔	✔
FCAS	✔	✔	✔
Capacity	✔	✓	✓
Avoided distribution investment		✓	✓
Reduced solar curtailment		✔	✓
Voltage support		✓	✓

✔ Storage provides value which already can be fully monetized by the owner

✓ Storage provides value which cannot currently be fully monetized by the owner

01 Rewarding batteries for the value they provide

Both community-scale and household batteries provide multiple value streams to the energy system. However, these values are not always easily captured as a financial benefit. Legacy market designs primarily provide value and financial rewards to large-scale assets within the transmission system. For example, all battery types can provide generation capacity (sometimes called 'resource adequacy') to the system, but the initial design of the Capacity Investment Scheme only rewards large-scale, transmission connected storage.

To realise the benefits of community-scale (and household) storage, the electricity market's design needs to evolve so that small-scale resources are rewarded for the services and benefits they provide. A new design of the capacity scheme that enables smaller resources to participate and more dynamic network tariffs would both help all distributed storage projects.

Key priorities for moving forward

02 Identifying the best locations

The value of any community-scale battery project depends on its specific location. Areas with significant distribution network constraints, abundant solar generation, and expected increases in network expenditure are more likely to be valuable locations for community-scale storage. DNSPs have this information and third-party developers, who may otherwise be better able to innovate in their business model, do not. To overcome issues of asymmetric information, DNSPs could regularly report on the best areas for community-scale storage, perhaps via the Distribution Annual Planning Review process.

03 Building local industry

Community batteries are in their infancy. With world-leading adoption of rooftop solar and significant public funding, there is an opportunity for Australian firms to develop and operate community-scale batteries at lower costs and higher value. This requires effective allocation of funding that targets and tracks specific development objectives, such as the development of standard terms for efficient contracting and firms focused on different parts of the value chain (e.g. project development, control and/or project maintenance). Building a sustainable local industry will reduce battery costs to consumers in the long-term, while removing barriers to broader uptake and promoting competition in the sector.

Further recommendations

Industry leadership

The early investment in the development of community-scale batteries is an opportunity for Australia to lead a novel application of energy storage technology. This is an industrial policy benefit with global impacts.

Understand and manage community expectations

By working with community groups to understand their goals, project developers can better understand the issues faced by a particular community. Otherwise, there is a risk that communities may be supportive when a new battery is installed, but then stop supporting the battery later when the project falls short of potentially unrealistic expectations. The prioritisation of battery objectives needs to occur on a project-specific basis, as every community-scale battery will serve a different demographic in a different location. While demographic perspectives have been studied in papers such as the ANU study on Stakeholder views on the potential role of community scale storage in Australia, the interactions between community-specific goals and location-specific needs require further consideration in each community-scale storage project.

Better understand potential energy resilience benefits for communities at risk of extreme weather events

As extreme weather events become more common in Australia, community-scale batteries may provide additional—not just economic—value when contributing to community energy resilience with backup power to critical services provision.

Further recommendations (cont'd)

Encourage collaborative relationships that facilitate business models

Successful business models for community-scale storage are likely to involve partnerships. A business model for community-scale storage could involve a DNSP leasing the battery to a retailer or another form of collaboration involving the DNSP. Aggregators can achieve economies of scale by providing an umbrella service for smaller batteries that would otherwise not be commercially viable. Collaboration adds value when the returns from partnership outweigh the dilution of benefits and the costs of coordination.

Clarify the priorities of community-scale batteries

On both the customer side and the network side, the primary goal of the battery project needs to be clear. Since a battery cannot be used to pursue every opportunity simultaneously, the algorithm controlling battery dispatch needs to be designed to recognise the priorities of the relevant stakeholders. Otherwise, use of the battery may or may not align with the priorities of the project proponents and key stakeholders, particularly the local community. The economic modelling featured in this report is for hypothetical batteries in generic locations; every battery project needs to be designed to meet the needs of its owners, operators, and broader beneficiaries.

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Note: See Technical Appendix for data sources.

Clarity in the face of complexity

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