



Ausgrid Community Battery

Feasibility Study Report

A report for Ausgrid Operator Partnership.

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kpmg.com.au

Executive summary

Ausgrid Operator Partnership (Ausgrid), engaged KPMG and AECOM, to undertake a study to investigate the drivers that would make a Community Battery Initiative a cost-effective alternative to traditional network investment, now or in the future.

What were the key objectives of the study?

The study assessed a range of technical, commercial and regulatory factors impacting the feasibility of the business model for a shared community battery as an alternative to traditional network investment. The main question the study aimed to answer was the following:

Could a Community Battery Initiative be feasible, now or in the future, and if so, under which circumstances would this happen?

1.

- Technical options for battery design and costs
- Expected change in network conditions in future
- Conditions where community battery is needed?

2.

- Potential contribution and use of local customers in the Community Battery
- Market revenue potential from wholesale and ancillary services

3.

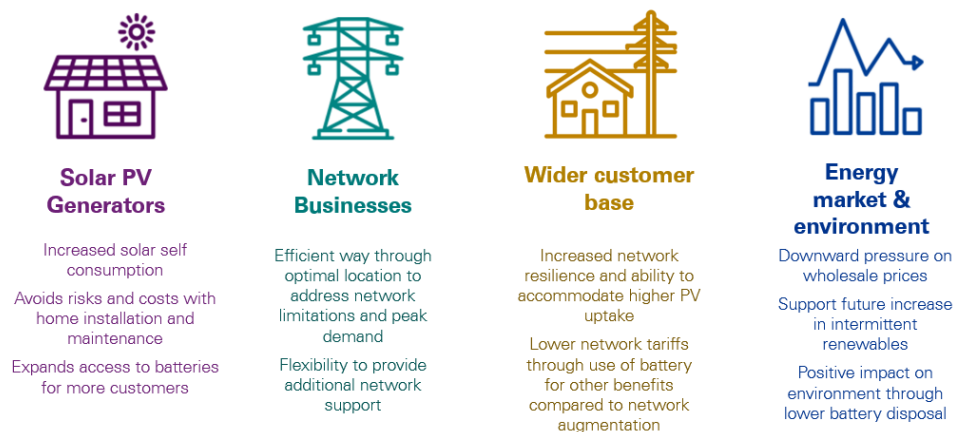
- Regulatory changes required to support standardised roll out of Community Batteries as an alternative network solution

To evaluate this, the multiple services that a community battery could offer and the associated benefits that can be captured from sharing the use of the battery across the community needs to be properly understood. Therefore the study considered each aspect of the business model by focusing on questions related to three areas - technical, commercial and regulatory, as listed on the left.

What is a community battery?

A community battery is a locally-based shared battery (operating 'in front of the meter') through which customers are able to store excess solar PV energy which they can then access at a later time to offset their energy import. In parallel, the community battery can also be used to support network operations and potentially trade in the wholesale markets. The concept involves the installation of a battery that would be connected to local distribution centres. This has the potential to unlock the greatest value, providing much-needed low-voltage network support.

A community battery has the potential to provide a cost-effective energy storage solution for *all customers* ('society') by addressing local electricity network constraints, as well as a range of broader system level services and benefits (wholesale market arbitrage, FCAS (Frequency Control Ancillary Services), photovoltaic (PV) customer storage-as-a-service, and additional benefits to customers, in the form of avoided capital expenditure for participating customers and benefits to the wider customer base. To be consistent with the framework for identifying efficient network investment under the National Electricity Rules, the benefits that all customers receive under a Community Battery Initiative must outweigh the costs.

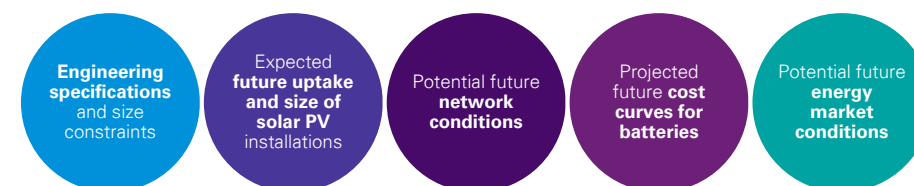


By stacking multiple end use cases and revenue sources, the business model for a community battery offers:

- **Cost reductions** through economies of scale compared to ‘behind the meter’ batteries;
- **Capacity optimisation** through diversity of customers’ energy usage patterns;
- **The opportunity to generate value from multiple revenue streams**, leading to a more economical solution; and
- **Dynamic use optimisation** through a ‘dispatch hierarchy’ to ensure available benefits are maximised at any given point in time.

What were the outcomes of the study?

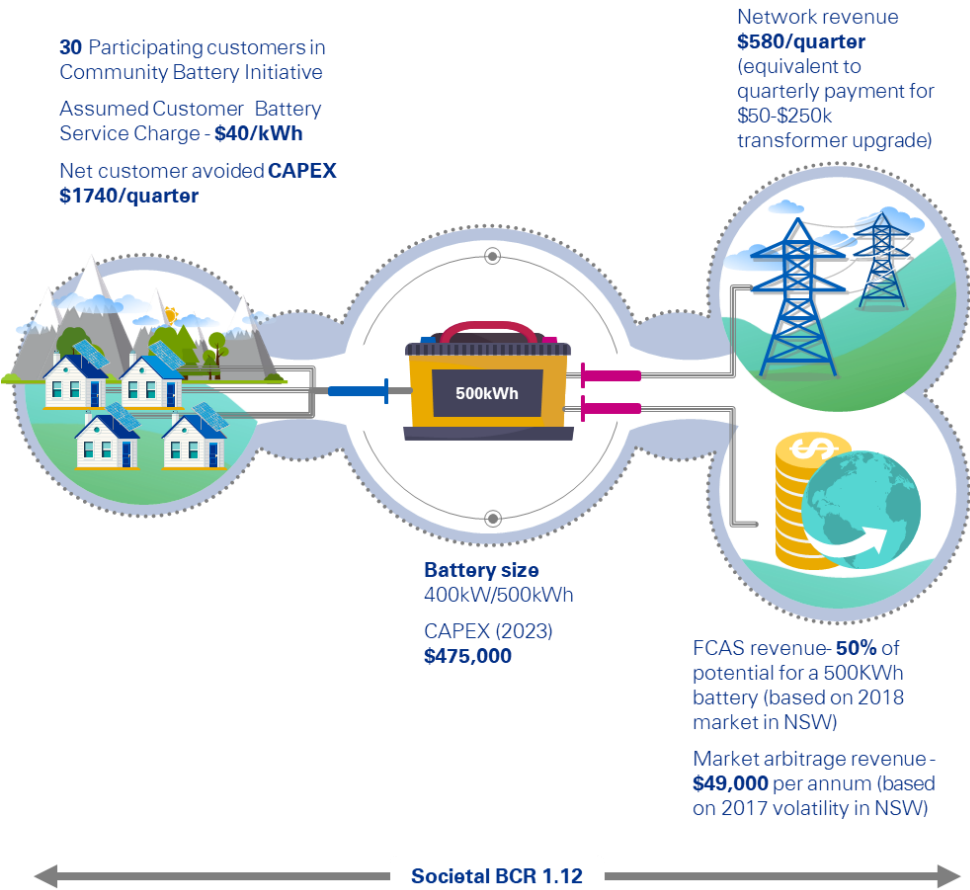
The study identified **three potential configurations** for battery installations that could be considered as alternative network solutions in local distribution centres, taking into consideration the following drivers:



Analysis of these configurations considered **a range of conditions under which a Community Battery Initiative could be feasible in the next 3-5 years.**

Among the cases tested, the optimal configuration could breakeven by 2023 achieving **an NPV of approximately \$4,500** in 2023. It was found that the **Community Battery Initiative could present a positive societal Benefit to Cost Ratio of 1.12 under a base case scenario**, which could result in a much greater benefit to society compared to traditional network investments, where the use case for the infrastructure would not be able to capture the same wide range of benefits.

Community Battery Initiative Prospect



WHAT ARE THE KEY COMMERCIAL DRIVERS?

CONTRIBUTION OF ALL USE CASES AND REVENUE SOURCES

The optimum configuration was found to capture relatively higher revenue from customer payments and customer savings, accounting for more than 20% of the total revenue stack.

A community battery would be more feasible in larger Distribution Centres (DC) with higher potential for solar PV customer growth.

MARKET CONDITIONS

The market revenue contributes approximately 80% of total revenue in the optimum configuration.

Cases that considered smaller batteries (250kWh), were unable to break even by 2028 due to more limited market revenue capture.

The level of market volatility is a key driver for the overall economic feasibility.

What are the potential benefits and barriers for a community battery?

Potential Benefits



	Networks	Potential to be more cost effective than traditional network investment.
	Regulators	Potential to prevent market failure and wealth transfer.
	Market Participants (investors and decision makers)	Development of new business and operating models generating new opportunities for market participants including investors and technology operators.
	Customers	Lowers energy bills for participating customers while minimising risks related to over-purchasing capacity, complexity in operations, safety and integration with existing systems associated with home batteries. Additionally, avoidance of network events may provide benefits to the wider customer base.
	Competition	Initiative will be available to all eligible customers regardless of retailer/plans.
	Suppliers	Supports supplier development and refinement of standardised commercial off-the shelf technology.
	Government	Opportunity to achieve storage at scale and ensure equitable access.
	R&D	Encourage further research and development with respect to battery technology, regulation and commercial viability to optimise future projects.

Potential Barriers



	Regulations	Rule changes required to support standardised roll-out across distribution networks.
	Energy settlement	Process for settlement including metering, data collection and treatment of losses to be considered.
	Market Volatility	Commercial outcomes are heavily dependent upon market conditions including spread, volatility and ancillary markets which currently are very uncertain.