

# Making community scale batteries work at scale in Australia

Advice from the Community Scale Batteries Working Group

7th June 2022

## Key messages

*Community scale batteries could play a significant role in the energy transition, providing affordable local storage for excess rooftop solar energy and equitable access to renewable energy for non-solar owners.*

*We recommend that publicly funded projects feature clear program objectives, consistently applied assessment criteria for project selection and oversight by an independent public authority.*

*An independent public authority is needed to support and oversee the roll-out of community scale batteries and other community energy projects (e.g. a community energy office within ARENA).*

*A carefully designed community battery policy could help address current unknowns (e.g. ownership models, battery services) in order for community scale batteries to maximise their potential.*

**The OGW report finding that Powercor has a different tariff for third-party batteries than it has for Powercor owned batteries provides a very powerful reminder that monopoly participation in competitive markets can substantially weaken or (at worst) destroy competitive outcomes. OGW recommend “prohibiting Powercor (and all network businesses) from trialing (sic) distributor-owned grid side battery tariffs on competitive neutrality grounds”<sup>1</sup>.**

While this particular instance of discrimination relates to tariffs, there are many other areas where a DNSP could seek to favour its own battery assets to the detriment of third parties and consumers. The DNSP control of the connection process is also another area where third-party applications could be restricted in favour of DNSP owned assets.

## Background

This document is the work of the Community Scale Battery Working Group (CSBWG) (1) members named at the end (2), and is based on a workshop held on 1 March 2022. The views expressed do not necessarily represent those of the organisations that the authors or other members of the CSBWG represent or work for.

The Australian Labor Party (ALP) has sought the CSBWG’s advice on its “Power to the People” community scale batteries policy. The CSBWG provides the following advice for all parties interested in publicly funded community scale batteries.

Our advice is based on the practical experience of CSBWG members, as well as neighbourhood battery research carried out to date, including guidelines to be published shortly by the Victorian Government (Department of Environment, Land, Water and Planning - DELWP).

## What is a community scale battery?

The term “community batteries” properly refers to models in which the local community is directly involved in the battery project, either through ownership, investment, governance, operation/control or another form of involvement.

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<sup>1</sup> OGW, Network tariff analysis and recommendations, July 2022, p6

Community batteries are generally in the range of 100 kWh to 1 MWh, and are most often located in front of (or on the grid side of) customer meters, but still close to small customers. However, not all batteries which meet these criteria feature direct community involvement. Although most are owned by networks so far, there is strong interest in trialing ownership by other parties -- e.g. non-profits, retailers, aggregators or community groups.

In this paper we use the terms “community *scale*” or “neighbourhood” batteries to refer to midscale “front of meter” batteries, whether or not they feature community involvement. We encourage all parties to only use the term “community batteries” where there is genuine and direct local community involvement.

## **Executive Summary**

**Section 1** *What the working group agrees we know about implementing community scale batteries:*

- There is strong interest from the public and the energy industry in community scale batteries, which can provide an opportunity to engage local communities (including non-solar owners) in the energy transition.
- There are potential advantages in economic efficiency, fairness and customer satisfaction with community scale batteries compared to household batteries.
- Carefully considered governance will be required to ensure that the expected economic, environmental and equity impacts are realised.
- Network pricing reform and innovation in network services and partnerships will be important.

**Section 2** *What the working group agrees we don't know but need to answer to inform the program:*

- It is currently unclear what roles community scale batteries could best play in the energy transition, so further work is needed to understand and quantify the benefits and costs.
- Multiple business, ownership and operating models are still being developed, and ongoing support is needed for pilots and trials that share lessons learned.
- A range of other issues need to be resolved, such as supply chain considerations; lifecycle environmental impacts including battery cell recycling; how to ensure the long-term financial viability of projects; community concerns around noise, space, visual and perceived or real safety risks; the need for network tariff reforms; and how to integrate electric vehicles with community scale batteries.

**Section 3** *What considerations will be critical to the success of a community battery program:*

- The overarching policy intent should be clearly stated and aligned with community expectations and values.
- Network constraint maps (for both load and solar exports) should be available to help ensure that, where relevant, community scale batteries can support the electricity network.
- Projects should be selected utilising the following assessment criteria:
  1. A preference for locations with (a) high local solar penetration and/or high solar exports, strong community (b) DNSP and Council support and (c) suitable available land.
  2. The project management capabilities of the lead organisation or consortium, including (a) its financial stability and cybersecurity capabilities (b) realistic and achievable project timelines and (c) its likely long-term capability to manage the battery project, both financially and logistically.
  3. The viability of the ownership and business model involved.
  4. The expected increase in the use of local renewable energy and/or reduction in emissions.
  5. The utilisation of existing or forthcoming Australian manufacturing capabilities.

#### **Section 4** *How a publicly funded community battery program should be governed:*

- An independent public authority should be funded to coordinate, support and oversee the roll-out of community scale batteries and other community energy projects e.g. a community energy office within ARENA. The office could be responsible for overseeing research into the unknowns listed in Section 2, administering the program, as well as providing technical expertise, regulatory support and building capacity in communities.
- Adopt the best practice governance principles of independence, accountability and transparency, as well as local community input or representation.
- Avoid political interference, hasty implementation, funding white elephants and burnout.

The CSBWG would welcome any further questions that the ALP or any other political party has related to these recommendations.

#### **Section 1: What the group (CSBWG) agrees we know**

There is a huge interest in community scale batteries. Householders see community scale batteries as another important step in decarbonising the energy system, and increasing accountability and local control over the energy transition<sup>2</sup>. Community scale batteries provide the opportunity to **engage the community** in the energy transition without burdening them with financial or administrative responsibilities. If carefully designed, they can reduce costs and increase social benefits without exacerbating inequalities between 'engaged' householders and other consumers, by allowing non-battery and solar owners to share in the benefits of local solar generation and storage. In addition, as shared storage assets they are a more **efficient** option than household batteries due to the diversity in household electricity demand within a neighbourhood and the economies of scale. involved.

The benefits of rooftop solar are enhanced by storage in the form of household batteries, electric vehicles and community scale batteries, by absorbing solar during the day and **providing local supply** during the evening and early morning demand peaks. Community scale batteries can also deliver **network benefits**, potentially avoiding line and substation upgrades to cater for increased local peak demand or high local solar exports; or to help solve local voltage or other technical issues. The network benefits can be realised through a contract or a tariff with the network operator, with payments contributing to the financial viability of the battery. When appropriately sited, sized and operated, community scale batteries can **improve the resilience of the energy system** in the face of more severe and frequent weather events resulting from climate change. Batteries can also earn revenue through participating in the spot and FCAS markets.

#### **The successful roll-out of community scale batteries at scale will require:**

1. **A clear explanation of the benefits and beneficiaries of community scale batteries, as well as who will be involved and how.** For example, the public expects that community scale batteries will deliver a net **environmental benefit**, which is not a given but depends on how the battery is operated (if charging from fossil fuels rather than renewables, batteries can increase emissions). Supply chains need to be considered, particularly as battery materials have been associated with exploitation and conflict in the developing world. Finally, battery projects need to consider the role and value of battery cell recycling in a circular economy. Note that the National Electricity Objective (NEO) and the National Electricity Rules (NER) are insufficient for providing guidance on operating energy technologies in line with community

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<sup>2</sup> <https://arena.gov.au/knowledge-bank/stakeholder-views-on-the-potential-role-of-community-scale-storage-in-australia/>

expectations. However, projects that align with community expectations and values will build trust among community members, and build support for the transition to renewables

2. **A level of support from network businesses that is currently not required by legislation.** For example, **network pricing reform** is critical, including changes to electricity network tariffs. Currently, these charges can make battery business models financially unfeasible and potentially discourage desired battery behaviour (e.g. penalising a fast response to a network peak grid constraint). Some networks are designing specific community battery tariffs, but there is currently no regulatory requirement for networks to trial or support such tariffs. Network businesses are also critical for the successful implementation of battery projects (e.g. placement, connection, operation), yet **processes and reward structures for networks to provide support to third parties who seek to own and connect community scale batteries are lacking.** In addition to network pricing reform, there is a clear need for consistent, easy to understand, publicly accessible, geospatial mapping information on electricity distribution network constraints, to inform the development of community-based renewable energy projects.
3. **Innovation** around metering, AEMO settlements and council approvals, all of which may require adjustments to motivate successful community battery models.
4. The financial rewards for non-energy services that batteries can provide, including increased hosting capacity, emissions reduction and resilience.
5. **Funding for an entity to provide establishment support** to work with interested parties to understand the steps required to establish a community battery. This entity could advise on project feasibility, value streams, different models, community engagement, procurement, aggregation options, retail options, connection advice etc to help fast track projects.

## Section 2: What the group agrees we don't know but need to answer

There is a diversity of possible community battery **business/ownership models**, but it is unknown which models will work best to deliver particular services/values, how to define what makes a successful model, and which model(s) will make the greatest difference to the speed, equity and affordability of the energy transition. Nascent technologies such as community scale batteries do not have clear funding and investment streams and further work is required to reach mainstream commercialisation. We anticipate that there will also be a diversity of models to reflect the different needs and expectations of different communities.

Currently unanswered questions include:

- how much community scale batteries increase hosting capacity (i.e. how much extra rooftop solar and how many extra EVs can be installed without adding to overall network costs) compared to alternatives,
- the cost/benefit of community scale batteries vs home batteries,
- what scale or size of battery(s) is best (for all stakeholders),
- the impact on emissions reductions,
- avoided losses (energy lost in transmission) associated with local generation and storage,
- who benefits from and who pays for local energy in regional Australia,
- how community scale batteries can support the uptake of electric vehicles, and
- how communities will feel about batteries in their neighbourhoods including perceived or real noise, space, visual, or safety risks.

## Section 3: What considerations are critical to the success of a community battery policy?

To increase the success of any community battery policy, we recommend that:

- the policy intent is clearly stated and aligned with community expectations and values, including a quantifiable commitment to a renewable long-term vision and to equitable outcomes to avoid 'haves and have nots',
- networks are required to publish a constraint map (for both load and solar exports) to indicate where they are likely to pay for network support and to address the information asymmetry between network business and other community battery owners,
- subsidised projects should be required to collect and share specific project data which will allow assessment of the cost and benefits of community scale batteries compared to alternatives, and
- an independent and trustworthy agency is established to administer the program across the nation without favouring any states and territories. This does not mean there should be a quota per jurisdiction, rather that each project application should be assessed on its merits. See section 4 for further recommendations on governance.

We recommend the following assessment criteria are used by the agency overseeing this program:

1. A well-established leading and financially stable organisation or consortium able to demonstrate successful prior activities in community education and engagement on energy concepts and their impact on consumption, solar installations and electricity bills. The organisation should be able to demonstrate how the future operational/maintenance costs of the battery could be provided for, if not met by any income generated by the battery.
2. Demonstrated cybersecurity capabilities to ensure that personal details and network integrity are preserved.
3. Defined ownership and business models, with a clear statement of benefits detailing all tapped value streams and impacts of network charges, noting that projects may not result in overall commercial feasibility during early phases but should have the capacity to test different revenue opportunities to find a feasible structure at later project stages. The potential for project learning should also be considered in addition to standard feasibility metrics.
4. Compliance with community expectations on size, noise, safety and other environmental factors.
5. Expected increase in use of renewables as a result of the project, with a requirement for funded projects to supply accessible statistics on renewable content of energy used to charge the batteries.
6. A preference for projects that rely on Australian manufacturing and software to build a local industry in battery research & manufacturing, and to reduce dependence on offshore supply chains, and
7. A preference for locations with:
  - high solar penetration (kW installed PV panels) and/or high solar exports (kWh of energy) per annum. Any neighbourhood should be eligible to have a community battery commensurate with the local installed solar capacity, for equitable outcomes (to avoid 'haves and have nots').
  - strong community, DNSP, and Council support for the project, and
  - available common land for hosting the community battery.

Note: The amount of solar exports per annum is a better indicator of a potential benefit from storing energy locally than the penetration of home batteries in the LV network.

#### **Section 4: How should the program be governed?**

The following governance principles are viewed as important to the success of the policy:

- Independence
- Accountability
- Transparency
- Local community input and benefits to community

Conversely, the following governance risks were identified:

- Political interference (eg, pork-barrelling)
- Hasty implementation and funding white elephants
- Burnout (ie, administrative burdens on community energy projects managed by volunteers).

In practice, this means:

- Successful projects should be selected according to publicly available assessment criteria (as per #3 above) and by an independent panel (ie, free of political interference) with competence in renewable energy generation, community energy models and projects, and energy systems and markets (including distribution networks).
- The program should be implemented and monitored by a federal government agency with relevant competence in public sector grant administration.
- The federal agency should work as much as possible through state/territory and local governments, ensuring on-the-ground experience is leveraged and decisions are made with an understanding of the local context.
- A steering committee should be established to advise the federal agency and also grant recipients as their projects progress.
- Transparency and auditing of application assessments, awards and financing to gain stakeholder confidence that there is no bias for political or other reasons.
- Ongoing communication between grant recipients should be encouraged to foster capacity building and 'learning by doing'.
- Since there is no market competition involved, all program and individual project documents should be publicly available rather than commercial in confidence
- The federal agency should also be responsible for initiating regulatory reforms where necessary to improve the technical, social and financial viability of selected projects (eg, around tariffs, connection fees/processes, metering/billing, consumer protections)
- The program should be rolled out either in multiple rounds of no less than three years -- e.g.:
  - Year 1 (FY23): Governance framework established; grant applications invited; successful projects selected
  - Year 2 (FY24): Feasibility studies conducted and successful projects greenlit
  - Year 3 (FY25): Construction and commissioning
- Projects should only proceed to construction following a positive feasibility study.
- The federal agency should set out clear project milestones, but reporting requirements for individual projects should be streamlined and infrequent (e.g, every 6 months) and should be balanced against the ability of smaller community-based organisations' ability to meet burdensome requirements.

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(1) The Community Scale Batteries Working Group (CSBWG) is an informal collaboration of staff from environmental and energy user groups, research institutions, community energy groups, retailers and governments around Australia. It was created in late 2020 and meets online monthly to discuss topics of common interest including business cases, technical issues, ownership and operational models, planning, environmental and social license issues, and user experiences. The CSBWG is managed by a steering committee consisting of Dr Mark Byrne, Total Environment Centre (convenor); Dr Marnie Shaw (chair),

ANU; Chris Wallin, Yarra Energy Foundation; Laura Lynch, DELWP Victoria; and Alida Jansen van Vuuren, Ausgrid. The objective of the CSBWG is *to give community scale/community scale batteries the best possible chance of becoming an important part of the energy transition.*

(2) The following Community scale battery working group (CSBWG) members contributed to this document:

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