8.10. Review of Neighbourhood Power Sharing Schemes

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ATTACHMENTS: Nil

PURPOSE:

The purpose of this report is to address the resolution of Council at the 23 May 2022 Council meeting regarding neighbourhood power sharing schemes for North Sydney.

EXECUTIVE SUMMARY:

Different models of neighbourhood power sharing schemes exist in Australia, all with the long-term goal of storing energy generated by solar panels in batteries which can then be shared between neighbours, or to a network.

This report provides an overview of existing models operating in NSW and around Australia, and the current opportunities and challenges for such schemes in North Sydney.

FINANCIAL IMPLICATIONS:

Monies necessary to progress any possible outcomes of the feasibility study is not included in the budget estimates for the 2022/23 financial year. Continued promotion of programs encouraging the uptake of solar will be funded under existing arrangements as approved in the Environmental Levy.

RECOMMENDATION:
1.THAT Council continues to encourage the uptake of rooftop solar systems in the community via the Future Proofing Apartments program and other education campaigns.
2.THAT Council conduct a feasibility study into a power sharing scheme for a Council owned multi-unit social housing property.

LINK TO COMMUNITY STRATEGIC PLAN

The relationship with the Community Strategic Plan is as follows:

1. Our Living Environment
1.2 Environmentally sustainable community

2. Our Built Infrastructure
2.1 Infrastructure and assets meet diverse community needs

BACKGROUND

The idea of energy sharing is to meet individual energy needs through renewable energy sources, typically through rooftop solar electricity, and to sell, store or consume excess energy within a sharing community. By sharing energy generation and demand, involved parties can see cost savings and greater self-sufficiency.

Energy sharing schemes are still relatively new in Australia with most operating in the trial stages, with the exception to this being strata energy sharing which now has a proven model on the market.

This report addresses the resolution of Council at the 23 May 2022 meeting that:

> *1. Council be provided with a report on neighbourhood power sharing schemes, including consideration of a pilot scheme, and identifying areas deemed feasible for such schemes.*
> *2. If such a scheme were found to be feasible, a number of areas be selected as pilot projects, especially where there are concentrations of high and medium density housing with multiple residencies.*

CONSULTATION REQUIREMENTS

Community engagement is not required.

DETAIL

There are currently only a few options for neighbourhood power sharing schemes that exist within Australia. Existing schemes occur on a strata level, sharing power among residents in a multi-unit development (MUD), or a wider community level via neighbourhood/community batteries and microgrids.

A review of existing options is provided below.

1. Strata Energy Sharing

There are currently around 1100 apartments within 120 strata buildings that are utilising energy sharing technology in Australia. Approximately 30 of these schemes are in the Sydney region, and many of these are within the local Ausgrid electricity network, the same network that North Sydney sits within.

Strata energy sharing utilises energy from a single solar system on the common roof and directs it to participating units behind the meter. The technology which enables strata energy sharing can be retrofitted into existing strata buildings, is deemed to be the most straightforward and is currently an available and proven electricity sharing system for MUD's.

The only program currently on the market is SolShare by Allume Energy. SolShare is a distribution box that can direct solar energy to multiple apartments simultaneously. It optimises the solar delivery based on who needs the energy at any point in time, while also ensuring that every apartment receives the same amount of solar over the course of each month. Figure 1 shows how the system works.

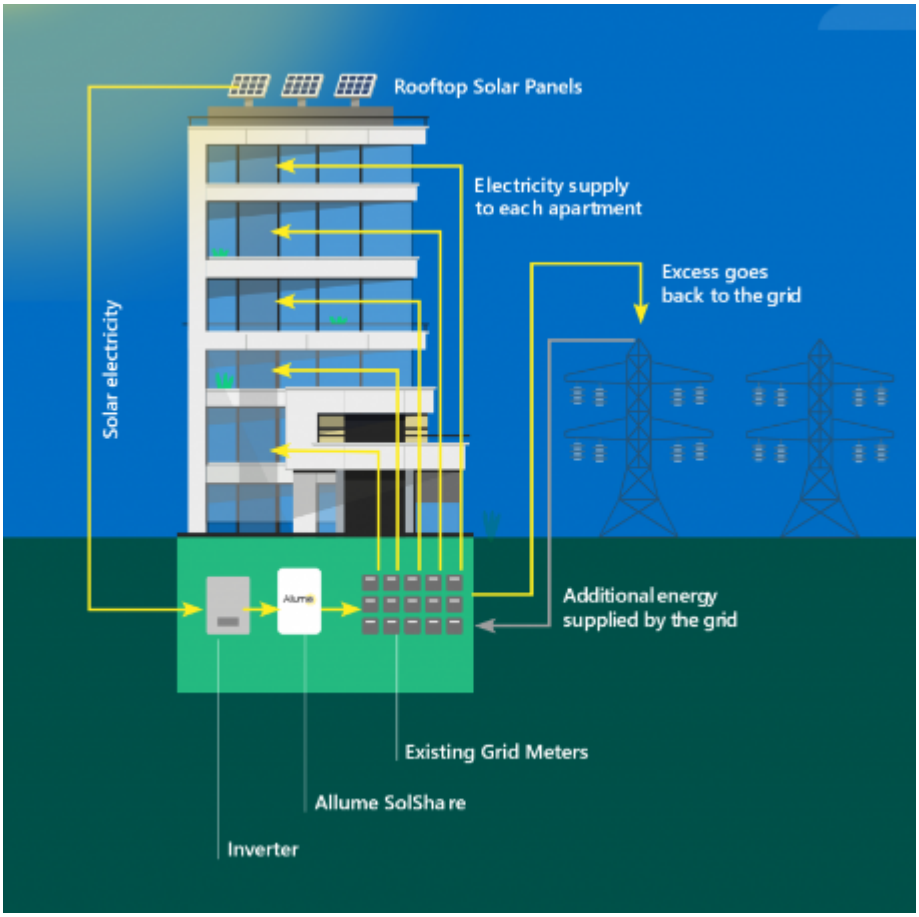


Fig 1. SolShare by Allume Energy (Allume Energy 2022)

A significant advantage of this strata power sharing system is that no batteries are required for power to be shared, and no existing regulatory barriers need to be overcome. Batteries can however be incorporated for additional benefits.

A local example of strata energy sharing is in Neutral Bay where a 4 apartment MUD installed a 16kW solar system on the common roof area. Since installation of the SolShare program each unit is benefitting from $656 savings per household per year, $550 owners corporation savings per year and 11 tonnes of CO2 per year.

This power sharing system is currently on offer within Council's Futureproofing Apartments program and is available to any strata community in Australia. The Future Proofing Apartments program aims to improve the environmental footprint of strata buildings in the North Sydney local government area by identifying and implementing priority actions that reduce greenhouse gas emissions and potable water consumption. The program assists in reaching Councils community carbon footprint target of 65% reduction in GHG emissions by 2030 and aids the strata community by reducing the cost of living in apartment buildings.
Council funds audits that inform a business case for a range of upgrade opportunities that strata can implement, and acts as a liaison between consultants and strata to aid in the successful implementation of projects.

2. Community Batteries

A community battery is a relatively new concept in Australia, offering a shared battery solution in a local neighbourhood, allowing customers and the wider community to access the benefits of battery storage. Community batteries tend to be more suited for parts of the grid where there are lots of rooftop solar systems.

A community battery allows participating customers with rooftop solar to store their spare power in a large battery located outside their property boundary (Fig 2). That power could then be used by them later in the day or shared with others on the same local electricity network.

Whilst there are many direct benefits for solar customers, the benefits of community batteries are not just limited to a select few. These benefits include:

- They encourage greater solar uptake by households and businesses, increasing the amount of renewable energy in the system.
- They make access to battery storage more equitable and accessible for all customers, particularly those who aren't currently able to install their own household battery.
- Lower bills for solar customers because they can consume more of their own stored solar power.
- Easier to participate in energy sharing due to batteries being purchased and maintained by others, at a lower cost per unit of electricity stored, due to community batteries being of a larger scale.
- Helping to reduce overall electricity costs to all customers by reducing peak loads in the system while enabling more solar to be installed on the network.
- Allow greater uptake of electric vehicles in the community.
- Greater electricity network reliability.

- Offer an alternative to traditional infrastructure (poles and wires) investment helping energy distributors place downward pressure on energy prices.

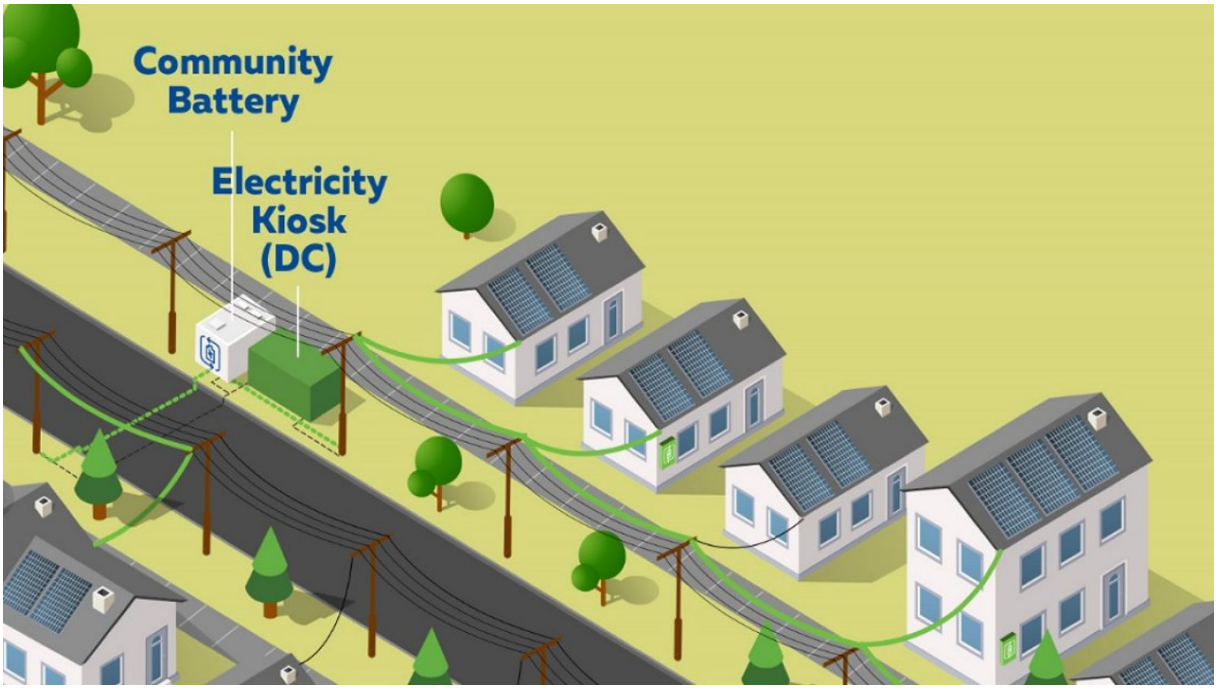


Figure 2. Community Battery Diagram (Solar Quotes 2022)

Currently, Ausgrid has installed three community batteries across its network in NSW and is offering customers in identified trial areas, who either have solar or are about to install solar, the chance to be part of this initiative. Trial locations include Beacon Hill on Sydney's Northern Beaches, Bankstown in Sydney's West and Cameron Park in Lake Macquarie.

Trial sites were selected to maximise the benefit to local solar customers. Areas where there was a high number of customers served by the local distribution kiosk who already had solar power systems were chosen. In addition, sites were selected that showed future growth in solar systems or where customer demand might be better managed by a community battery.

The 2-year trial will test how community batteries can help manage local networks in a flexible manner and the results will inform a potential wider scale roll out in the future.

Community batteries are a great opportunity however there are many challenges that exist in North Sydney that could preclude the installation of them in our community. Some of these challenges include:

- North Sydney has a very low number or concentration of rooftop solar systems, with approximately 2% for residential and 1% for commercial (see Table 1). For context, the national average is 25% of homes with rooftop solar.
- Short supply of suitable land in the North Sydney LGA.
- Planning consent. There are multiple regulations that need to be addressed to enable a battery to be located on public land.

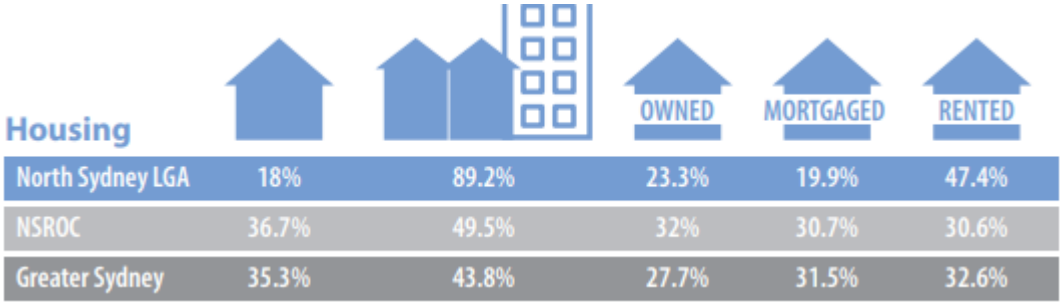
- Community battery schemes are currently in the highly experimental stage due to the considerable complexity within the regulatory & electricity market landscapes.

Table 1. Solar installations in North Sydney LGA

Solar PV installations in the North Sydney LGA (Ausgrid data, 2021)	**Residential customers**	**with solar**	**% of customer base**
	39,700	690	2%
	Business customers	with solar	% of customer base
	6,305	75	1%

As mentioned, community batteries are best suited to areas of high rooftop solar system uptake which unfortunately is not the case in North Sydney. This is primarily due to the high proportion of MUD's and the high percentage of leased properties in the local government area (see Table 2).

Table 2. North Sydney LGA Housing Comparison (Source: North Sydney Vision 2040, Community Strategic Plan)



With 89% of dwellings being MUD's, issues including strata committee buy in and the fact that the financial benefits are often realised by tenants not owners, preclude high rates of solar uptake. In addition, 47% of properties are leased meaning the decision to instal rooftop solar is out of the tenants' hands. Shading from trees and other buildings, as well as heritage concerns are, whilst minor, still important reasons behind low rooftop solar rates in the North Sydney LGA.

Community Battery Case Study- City of Yarra, Victoria

The City of Yarra partnered with the not for profit, Yarra Energy Foundation, to install a 110kW battery (284KwH storage) in Fitzroy North (Fig 3). The battery services 200 properties on the same sub network. The battery is all residential input with no kW minimum and there was no opt in for participation.

To identify the best site for the community battery a solar feasibility study was conducted to map out solar clusters in the LGA. High rates of rooftop solar PV meant that the battery could operate as a 'solar soaker' storing the excess energy generated throughout the day, discharging at night back to the community and the grid.

The Yarra Energy Foundation secured State government funding to purchase the battery which cost approximately $300,000. The battery generates revenue through energy arbitrage where it buys cheap energy during the day and sells back to the grid at night. It is managed by a third party who have aggregated it into its larger fleet as it is too small to operate independently.

Council involvement extended to being the landowner and assisting with planning consent, however they were keenly interested to be a part of the project from the beginning due to their Council targets around greenhouse gas emissions and increasing solar uptake. The Council also had a strategic objective to facilitate the rollout of community batteries across The City of Yarra.

Fig 3. City of Yarra community battery

3. Microgrids

Microgrids are a local electrical grid with defined boundaries, acting as a single and controllable entity. They are typically distinct locations which can be partially isolated from the main grid, that can participate in solar power production and energy storage, within a residential or commercial community (Figure 4). They differ from a commercial or residential strata scheme, where from an electricity grid point of view, they are all individual property entities, while strata schemes are identified as a single strata property entity.

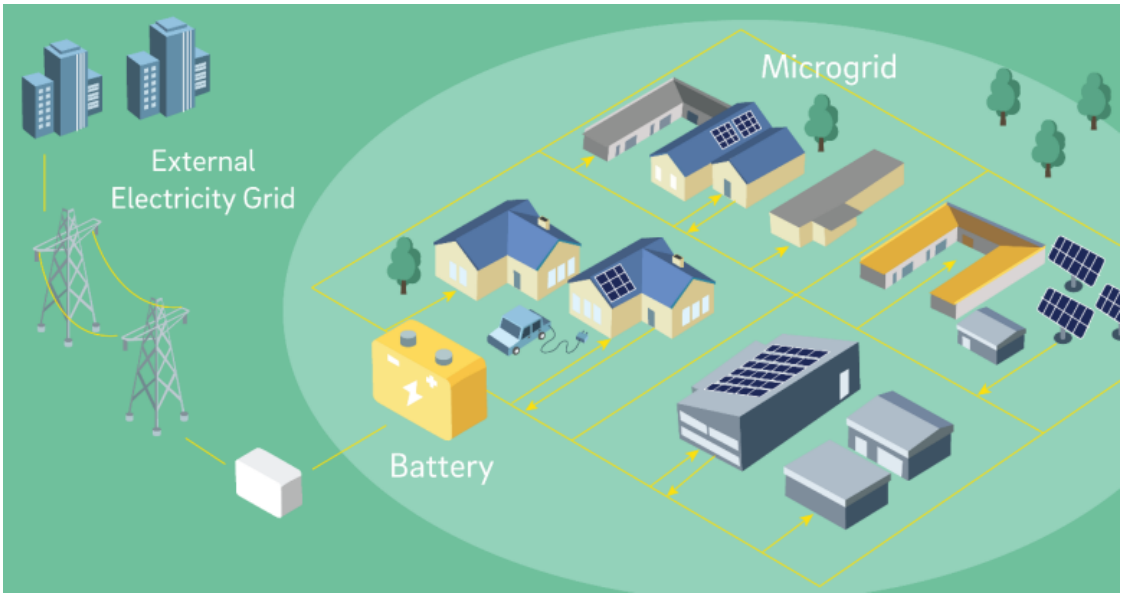


Figure 4. Microgrid diagram (Enova Energy 2022)

From a practical point of view, microgrids are costly to set up, considerably more complex than sharing within strata and are still in the highly experimental stage. There are currently two trials in Australia. The first is the Monash University microgrid which works with multiple meters within a single property boundary and the second is the Byron Bay Industrial microgrid, which is still in the planning stage after 4 years.

Modelling performed on the Monash microgrid indicated that there were generally net cost benefits to participants and net losses of revenue to network operators, meaning there is mixed incentives to each stakeholder which may slow down the rollout of microgrids. It was also found that to be economically viable, embedded networks need a minimum of approximately 30 properties.

Opportunities for North Sydney

Out of the power sharing schemes outlined above, the best opportunity for North Sydney Council and the community to engage in neighbourhood power sharing is through strata energy sharing. Any strata scheme with a roof suitable for solar PV would be able to participate, and the option is already offered through Councils Futureproofing Apartments Program.

Trialling this method on a Council owned multi-unit residential social housing scheme would be a great opportunity to assist Council in achieving our carbon footprint targets as well as providing renewable energy and cheaper electricity prices to those who would not normally be able to access it. Link Wentworth Housing, Councils social housing manager, has indicated three potential sites in the LGA where this could work.

With regards to community batteries, given the fact that rooftop solar system uptake is low in North Sydney, should consideration be given to a community battery, a feasibility study mapping out preferred locations would need to be undertaken. Community input and engagement will also be pivotal in deciding on the best location.