



Opportunities for Community Energy the Inner West

Authored by Community Power Agency

About the authors

Community Power Agency (CPA) is one of Australia’s leading organisations supporting the development of community and local energy initiatives. CPA’s mission is to grow a vibrant community energy sector in Australia. We do this through supporting community energy groups, and policy and advocacy work to remove the barriers facing all community energy projects. Formed by Jarra Hicks and Nicky Ison in 2011, CPA has grown to a dynamic team of five people. We are recognised across the sector for our community energy knowledge, networks and policy impact.

For further information visit: www.cpagency.org.au

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Executive summary

Community Power Agency was asked to provide an overview of potential community energy options for Inner West Council to support. This report summarises the findings and recommended options of initiatives that are feasible, viable and desirable in the Inner West context.

The report draws on Community Power Agency’s existing knowledge and experience and applies it to the Inner West, providing a status update on clean energy in the local area. It also gives an overview of community energy challenges and opportunities and offers recommendations and detailed explanations of selected options.

Community Power Agency has analysed 12 community energy options assessing their appropriateness for the Inner West. Consideration was particularly given to speed of implementation, visibility, and environmental and social impact. From this list, the Council identified 4 options that it is interested in investigating further. These options are summarised in Table 1.

Table 1: Summary of recommended community energy options for Inner West Council.

Model	Project	Short Description	CPA assessment
Investment model	Community Investment projects	Community initiated renewable energy projects that are funded by community investors	<p><i>Speed of implementation:</i> short to medium</p> <p><i>Visibility/ outreach:</i> medium to high</p> <p><i>Direct kW/ CO2 impact:</i> low to medium</p> <p><i>Social inclusiveness:</i> low to medium</p> <p><i>Overall IW:</i> employ a staff person to help recruit businesses to community solar programs. Open up at least one council roof to be the host site for a community investment project.</p>
	Revolving fund	Provide zero interest loans to non-profit organisations and the broader community	<p><i>Speed of implementation:</i> short to medium</p> <p><i>Visibility/ outreach:</i> medium to high</p> <p><i>Direct kW/ CO2 impact:</i> medium (depending on the funding and lifetime, the ultimate sum of all projects could have high impact)</p> <p><i>Social inclusiveness:</i> medium to high</p> <p><i>Overall IW:</i> set up and staff a revolving fund – start by targeting NFPs and consider expanding in the second year to low income households)</p>
Aggregated household model	Solar Gardens	Solar PV system located off-site and the household receives a financial benefit on their bill.	<p><i>Speed of implementation:</i> medium</p> <p><i>Visibility/ outreach:</i> high</p> <p><i>Direct kW/ CO2 impact:</i> depends on the size of the Solar Garden(s)</p> <p><i>Social inclusiveness:</i> high</p> <p><i>Overall for IW:</i> Pilot a Solar Garden with a local partner (e.g. Pingala) and/ or other councils. Advocate for a state wide rebate to make Solar Gardens accessible for low income renters.</p>
	Apartment microgrids	Embedded electricity networks, which serve multiple premises.	<p><i>Speed of implementation:</i> medium to long</p> <p><i>Visibility/ outreach:</i> medium</p> <p><i>Direct kW/ CO2 impact:</i> medium</p> <p><i>Social inclusiveness:</i> depends on the initiator – could be high</p> <p><i>Overall IW:</i> Encourage housing operators, community housing providers, strata managers in the Inner West to consider embedded networks. Change planning regulation and approval process for new developments requiring apartment renewable microgrids.</p>

If the Council wishes to establish itself as a leader in community energy, we recommend that it focus its efforts on Options 1 to 3. Option 4 should be considered as an additional action that would build on Council’s existing strengths. All options require additional resources and it should be noted that the implementation will take more than six months. Moreover the solar garden option particularly involves a certain degree of risk, but would make Council stand out as a pioneer in the Australian renewable energy space.

1. Introduction

Inner West Council is seeking to better understand current community energy approaches and identify community energy options that could be supported in their Local Government Area (LGA).

Community Power Agency (CPA) has been commissioned to develop this short report. This report will inform Inner West Council of the current desirable, feasible and viable community energy options suitable in the Inner West Council area.

With a growing interest in community energy, this is a timely piece of work. From a handful of initiatives in the early 2010s, to more than 105 groups and 90 operating projects today, the community energy sector in Australia is growing quickly.

Roles of local government in renewable energy deployment

Council can play an important role supporting and driving clean energy initiatives in, and with, their community. Driven by economic, social and environmental motivations, local governments (LGs) in Australia have become quite involved in small to medium scale renewable energy (RE) generation. This is despite energy generation not being part of their formal portfolio of responsibilities. Nevertheless, community enthusiasm and the opportunities that come with new technologies, have LGs pursuing renewables projects both for their own needs and those of their community.

Federal and state government inaction to tackle climate change is spurring LGs across the world to step into a leadership role. International networks such as ICLEI - Local Governments for Sustainability and national initiatives such as the Climate Council's Cities Power Partnership support LGs to capitalise on clean energy opportunities.

The Climate Council (2017) found that one in five LGs surveyed across Australia are aiming for "100% renewable energy" or "zero emissions" (Stock et al., 2017). These LGs include capital cities like Adelaide, Canberra, Melbourne and Sydney as well as smaller councils such as Byron Shire, Lismore, Indigo Shire and Uralla Shire.

Although LGs have limited resources and capacity, they have found many ways to engage, and ultimately benefit from, renewable energy and energy efficiency activities. These ways of engaging can be classified into the following six roles for LGs:

Table 2: Typology of LG engagement in renewable energy and local community energy activities

Typology	Characteristics
1. LG engagement as RE customers	Most common level of engagement in RE. Councils purchase green energy and undertake energy efficiency measures in order to save money, reduce carbon emissions and lead by example
2. LG engagement as educators/ information providers	Most common level of engagement with their communities in RE. Councils demonstrate good practice as role models by installing small-scale solar PV systems and also educating their community by offering information about RE systems
3. LG engagement as facilitators	Councils facilitate RE action of their communities e.g. coordinate bulk buy purchase and identify and broker relationships with reliable suppliers
4. LG engagement as innovators and participants	Councils actively drive and promote RE engagement with their communities through innovative programs e.g. rates-based finance of RE deployment
5. LG engagement as catalysts and supporters	Councils catalyse community renewable energy (CRE) initiatives by offering administrative support, council rooftop space or land as host site and providing funding to conduct feasibility studies
6. LG engagement as networkers and advocates	Councils collaborate and network with different stakeholders, including other councils, to strengthen their capacities for RE engagement and to advocate for institutional changes and/or new policy schemes on higher government levels that enable locally led RE initiatives

Source: Mey, Diesendorf, & MacGill (2016).

Despite the appetite in Australian communities for RE deployment, the institutional environment and energy policy context pose significant challenges. Hence LGs appear as natural facilitators to advance and accelerate local clean energy action.

Introducing Community Renewable Energy

Definition and benefits of community renewable energy

Community renewable energy initiatives are multifaceted and comprise a wide range of local energy-related activities that are generally led by local volunteers and not-for-profit organisations. Due to the diversity of actions that can fall under the CRE banner, it is important to define the scope of CRE. For the purpose of this report we will use the following definition developed by the Coalition for Community Energy.

Community energy projects are social or community enterprises, driven by local people. That is, community energy groups tend to have a social and environmental driver, as well as an economic one.

Community energy projects encompass a range of technologies and activities across a breadth of scales, determined by community needs, availability of local natural resources, technologies and funding, and community support.

Community energy projects often allow individuals to be involved in clean energy beyond the bounds of their own home or business and in so doing bring a range of benefits and opportunities for their household and for the wider community. Community energy enables collective action, which can go beyond what is possible by individuals acting on their own. A community energy project is founded on more than one of the following elements:

- Ownership and/or decision making power involves local individuals and stakeholders
- Project development and design is driven by local individuals and stakeholders
- Benefits from the project go to local individuals and stakeholders
- The amount of energy produced matches local energy needs
- While communities of place are emphasised in referring to 'local' communities, communities of interest are also relevant – such as the Coalition for Community Energy (C4CE).

Box 1: Defining community renewable energy
Source: C4CE, 2015

There are a number of motivators and drivers for CRE actors as shown in Figure 1. It is important for a community to understand these elements at the beginning of a specific project direction. This will ensure that the motivators ultimately translate into the benefits the project is going to seek.

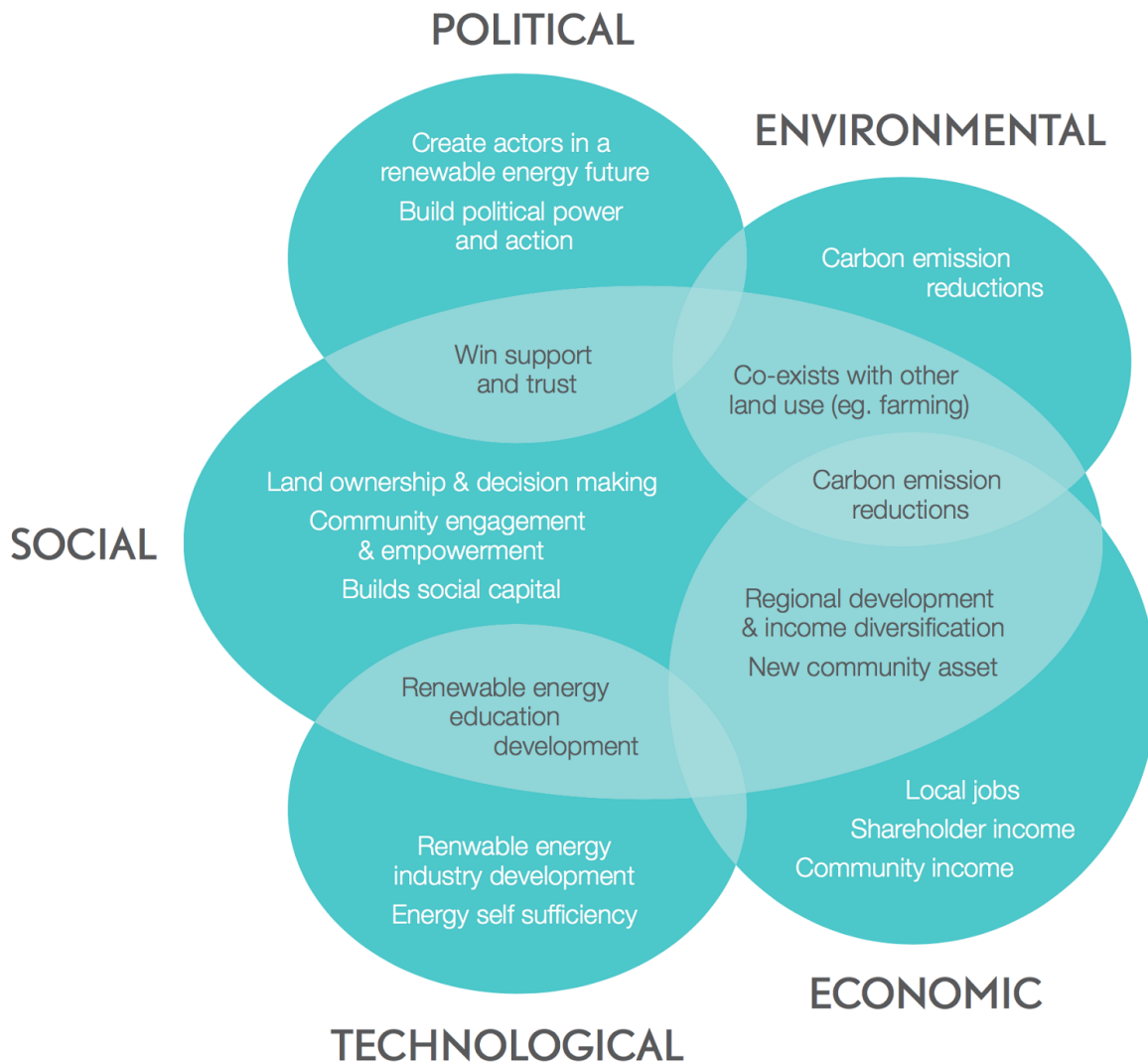


Figure 2: Motivators and benefits of community energy
Source: Hicks, J. & Ison, N., 2012.

Council leadership in community energy

While many councils are already sustainability leaders in areas of waste, water, community engagement and more, renewable energy is a new field that councils can embrace and in which they can demonstrate leadership.

Councils are increasingly taking an enabling approach to clean energy and playing a leadership role supporting community energy projects. This includes facilitating, co-ordinating, promoting and encouraging local clean energy action. Leading Australian councils in the community energy space include:

- City of Sydney Council –supported Pingala, Young Henrys and Stucco with grant funding enabling the implementation of their community energy projects;
- Darebin City Council –pioneered the rates financing mechanism in partnership with Moreland Energy Foundation (MEFL) to enable pensioners and low-income home owners to install solar panels at no up-front cost;
- Lismore City Council –created Australia’s first council-operated and community-funded solar farms; and
- Moreland City Council –established the not-for-profit organisation Moreland Energy Foundation more than a decade ago to work with the local community to reduce greenhouse gas emissions and implement its Zero Carbon Evolution Strategy.

These councils all recognised that community energy can help them achieve their community sustainability and climate goals. However, doing so has required:

- A commitment to innovation, trying new things and thus an appetite for risk;
- A willingness to consider more than the single bottom line. For example, the Lismore community-council solar partnership would not have progressed if Lismore Council had assessed the project purely on financial terms;
- An internal champion with adequate resources and support to drive initiatives forward; and
- Multiple council teams to better coordinate and share information (e.g. the environment/energy, community, business engagement and finance teams).

Methodology

This report draws on Community Power Agency's knowledge of existing CRE models and projects currently under development and operating in Australia. The report has been developed by employing a three-stage methodology to identify viable, feasible and desirable community energy options for the Inner West.

We analysed a range of possible community energy initiatives within the context of the Inner West (see Section 2). To this purpose we considered existing initiatives, socio-demographics and renewable energy capacities in the area, and consulted with Council staff to identify the most desirable and feasible initiatives for the area. Specifically, we have attempted to answer the following main questions:

- How does the initiative work?
- How does it apply and fit in the Inner West Council context?
- Why is it worth pursuing?
- What initiative(s) should be prioritised?

The initiatives that were investigated can be structured under the following four models (see Appendix 1 for more detail):

- Investment models
- Donation models
- Aggregated household models
- Developer partnership models

It should be noted that given the definition of Community Renewable Energy (Box 1), this report will not include models and projects that are exclusively led or advanced by commercial actors, even if they benefit the community.

The report is structured as follows:

Section 2 focuses on the status of clean energy in the Inner West Council area and Council's sustainability vision and strategies.

Section 3 comprises an overview of community energy challenges and opportunities in the Inner West Council area, including local CRE initiatives.

Section 4 offers a summary of the recommendations derived from the list of options in Appendix 1.

Section 5 provides detailed explanations of the recommended and selected options.

2. Status of clean energy in the Inner West LGA

Council & community clean energy deployment

Sydney's Inner West is one of the most progressive urban communities in Australia. This is particularly reflected in the Council's commitment to taking the lead on environment and energy issues by developing strong environmental policies, divesting from fossil fuels and expanding rooftop solar.

In its long term Community Strategic Plan - *Our Inner West 2036* - the Council has set the ambitious goal to become a zero emissions community that generates and owns clean energy (Inner West Council, 2018d). To this purpose Council resolved to establish an Office of Renewable Energy Innovation (REI) to make the Inner West community a leader in renewable energy innovation (Inner West Council, 2017).

Council's strategy is twofold - it is focussed on its own electricity consumption and carbon footprint, as well as supporting the broader community, specifically households and small businesses, to take action on clean energy and energy savings. To deliver on the first focus, Inner West Council has already implemented 31 solar projects with a combined capacity of over 300 kW at Council facilities including pools, libraries, childcare centres and offices. It is also working towards retrofitting all viable Council-owned buildings with solar PV, and is undertaking projects to reduce energy consumption. Council entered into a Power Purchase Agreement (PPA) with Moree solar farm in 2018 to procure just over 4 million kilowatt-hours (kWh) of solar power each year, approximately equivalent to Council's total daytime electricity consumption.

In the broader community it is estimated that almost 15 MW of solar PV has been installed since 2007. This only covers 8.3% (3754) of the dwellings in the LGA, which is low compared with the national average, however is comparable with other metropolitan areas with similar housing tenure and types – rentals and apartments. In order to increase the uptake of renewable energy in the area, Council will need to provide more support and take action to help renters and apartment dwellers overcome the typical barriers to installing solar PV on these dwelling types. As the Inner West Council faces similar challenges to other metropolitan councils, there is the possibility of partnerships and joint learning.

Box 2: Solar PV capacity in the Inner West LGA

Source: Australian PV Institute, 2018

Council clean energy programs

To maximise renewable energy and energy efficiency uptake across the Inner West, Council has initiated a number of programs and activities, including:

- **SSROC's Our Energy Future Renewable Energy Master Plan** collaboration with eight other councils. The Master Plan helped to identify a range of practical and cost effective actions to deploy renewable energy. The Plan has resulted in the launch of SSROC's flagship program Our Energy Future in June 2017 (Ison et al., 2013; Our Energy Future, 2018). The program is delivered by social enterprise Positive Charge and offers quotes from trusted suppliers and detailed advice on

- **Est. dwellings:** 45465
- **Installations:** 3754 (approx. 8.3% of dwellings)
- **Est. installed capacity:** 14956 kW
- **Under 10kW:** 9758 kW (installations: 3586)
- **10-100kW:** 4208 kW (installations: 163)
- **Over 100kW:** 990 kW (installations: 1)

solar systems and installation for residents, council staff and small to medium businesses. The offering is designed to ensure that the customers receive free, tailored advice from trusted installers on energy efficiency and renewable energy (Our Energy Future, 2018).

- **The Council's Green Living Centre**, which played an early role in supporting and brokering Pingala and Young Henrys' community energy project, holds regular solar and energy efficiency workshops. The workshops are complemented by individual solar assessments for local residents who prefer a face-to-face discussion about the solar potential of their property (Green Living Centre, 2018).
- **The development of the SunSpot tool.** Through a recent collaboration with UNSW, the Australian Photovoltaic Institute and Council, the Inner West solar potential is mapped to inform community organisations, households, and businesses of their individual rooftop's potential. The SunSpot tool makes it easy for individual property owners to calculate how much electricity and money could be saved by installing a solar PV system on their rooftops (Australian PV Institute, 2018; Inner West Council, 2018).
- **The Cities Power Partnership.** In 2017, hoping to advance their work for a zero emissions community through access to experts and resources, Inner West Council joined the Cities Power Partnership (Climate Council, 2018) and have made a series of action pledges, including "investigate the best options and support residents and commercial property managers to install and own solar and renewable energy, including solar PV solutions that will decrease the cost of living for low income households."
- **Environmental grants** to support local environmental initiatives (Inner West Council, 2018). For example, grant and in-kind support has been provided in 2017–18 to Climate Change Balmain-Rozelle's Climate in the Pub series.

- **Supporting and advising local community organisations** undertake clean energy initiatives e.g. Marrickville Youth Resource Centre's Solar and Beyond project and Addison Road Community Centre.
- **In-kind support** for local community energy groups – Inner West Community Energy, Pingala, SunTenants - to participate free of charge in local events like Footprints EcoFestival
- **The Business Environment Awards**, which give local communities and innovative businesses the chance to showcase their achievements and be recognised for their work in the community. For example, Young Henrys won the Energy Smart category of the annual Business Environment Awards in 2018 in part for their community energy project with Pingala.

There are also new clean energy programs in development. For example, this year Council is delivering free sustainability consultations to 25 local businesses and organisations, which will include advice on renewables. Council is also considering Solar My School and a partnership with Australian Youth Climate Coalition (AYCC).

Inner West Council is now seeking to build on this track record and more systematically foster community energy in the Inner West.

3. Community energy challenges and opportunities in the Inner West

Starting as a fledgling sector in the early 2010s, CRE has matured to a concept that is more widely understood and recognised for its benefits and contributions to Australian communities. This is evident from the fact that there are currently 106 community energy groups across the country that have embarked on the journey to develop their own renewable or energy efficiency projects. The evolution and growing sophistication of the community energy sector in Australia is summarised in Appendix 2 including project examples, enablers, barriers and outcomes.

Challenges

It is important to note that the Australian energy market context and regulatory environment still pose some significant hurdles for community energy groups.

We have summarised seven of the most relevant challenges facing CRE that apply both to the wider context but also to the Inner West specifically.

1. *Finding an appropriate host site:* Most CRE projects currently operate behind the meter and below the load (see Box 3, below) to be economically viable. Hence project sites have to meet a number of technical criteria (with suitable load profiles) to be viable. In addition, the owners of the host sites will have to be motivated by more than commercial success since the interaction with the CRE groups requires additional work. Understanding that CRE projects will include outcomes and benefits beyond just financial returns is a key requisite to engage with local CRE groups. Finding host sites in the Inner West is made more challenging by the fact that many businesses rent, which makes the contractual arrangements more difficult.
2. *Costs to get the project running:* Usually CRE groups are led and run by volunteers with great enthusiasm but limited resources. Technical feasibility studies and legal advice are needed to determine the viability of CRE projects. These can be cost intensive and volunteer groups often don't have the resources to pay for it.
3. *Technical and legal knowledge:* New community energy groups starting out have to develop a range of skills and new knowledge, ranging from developing business models, to contract negotiation, scaling solar systems, to community engagement. This takes time and practice, especially when depending entirely on volunteers.
4. *Network connection:* Mid-scale renewable energy projects continue to pose a challenge, in significant part due to the grid connection process. Specifically, there is a lack of certainty about the timelines and costs, and network companies are traditionally reticent to engage with community energy groups.
5. *Lack of knowledge of existing programs:* Both council- and community-led energy programs could be much better promoted in the Inner West. However engagement takes resources and support. Securing these promotional resources is currently a challenge.

6. *High prevalence of 'locked-out' energy users:* A high proportion of households and businesses in the Inner West fall into the category of 'locked-out' renewable energy users. They face barriers such as split incentives (renters), unsuitable roofs (shaded or heritage listed) or high levels of complexity (apartment dwellers). There are community and social enterprise models to overcome these barriers, however they are less well developed and need more government support to enact than simpler community energy models such as bulk-buys.
7. *Heritage approvals for solar:* In general household rooftop solar installations do not require development consent if certain requirements are met e.g. limiting impact on neighbours, however heritage listed buildings or homes in a heritage conservation area can require development consent in certain circumstances which may act as a barrier to installing solar.

Addressing these challenges should be part of the remit of any CRE support program.

Box 3: Behind the meter and below the load: explained

Opportunities

The Inner West Council area has a young and educated population compared with the NSW average. Their living situation is split between:

- 50% of households who partially or fully own their home;
- 36.9% are renting privately; and
- 3.5% were in social housing in 2016 (.id community demographics, 2018).

The housing stock is generally medium or high density.

The socio-demographics of the Inner West provide fertile ground for community energy activities which offer both social and environmental solutions. In particular, younger people in rental accommodation, and those living in multi-unit dwellings, are suitable target groups for opportunities such as Solar Gardens (see Appendix 1, Aggregated Household Models), or community energy investments (see Appendix 1, Investment Model).

There are also a number of small local organisations and home-based businesses many of which are in the health and education sector (see Table 3), who could specifically benefit from additional support structures to access solar or other community energy projects in order to reduce their costs. These very small organisations and businesses could particularly benefit from solar, as they will have higher

“Behind the meter” refers to renewable energy generating facilities (e.g. solar PV systems) that produce power intended for use on-site.

“Below the load” means that the system is sized to produce no more energy than can be used on site, with no energy being exported to the grid.

daytime consumption than most households. Supporting this target audience would have the dual benefit of lowering household and business energy bills.

Table 3: Main industry sectors providing employment

Industry	Inner West LGA
Health Care & Social Assistance	12.2%
Education & Training	8.5%
Finance & Insurance Services	7.8%
Professional, Scientific and Technical Services	7.8%
Retail Trade	7.4%
Other	50%

Source: Inner West Council 2018

The Inner West Council area also has a large number of associations and cooperatives as shown in Table 4. Associations and cooperatives often have social aims and visions that are aligned with some of the drivers of CRE, namely community engagement, access and environmental protection. Therefore such organisations may be very interested in CRE and would be natural first contacts for Council's community energy offerings .

Table 4: Counts of community associations and cooperatives in the Inner West Council area.

Postcode	Suburb Name	CO-OPERATIVES	INCORPORATED ASSOCIATION
2204	Marrickville	6	118
2038	Annandale	0	37
2045	Haberfield	2	26
2040	Leichhardt, Lilyfield	3	64
2131	Ashfield	1	79
2048	Stanmore	1	26
2130	Summer Hill	1	26
2041	Birchgrove, Balmain, Balmain East	1	68
2049	Petersham, Lewisham	3	46
2044	Tempe, Sydenham, St Peters	0	34
2203	Dulwich Hill	1	38
2039	Rozelle	0	39
2132	Part of Croydon	1	37
2193	Part of Ashbury, Hurlstone Park	2	57
2133	Part of Croydon Park	0	30
2050	Part of Camperdown	0	21
2042	Part of Newtown, Enmore	5	77
	TOTAL	27	823

Source: Inner West Council 2018

Community energy groups in the Inner West

There is a clear appetite for clean energy innovation in the Inner West, as evidenced by the number of CRE groups and initiatives operating within, or in close proximity to, the area.

Pingala

One of the local groups is Pingala, a dual organisation which is a not-for profit association and cooperative, and works with local businesses and organisations to install solar farms on their roofs (Pingala, 2018). Pingala operates in the Inner West area and had its first project in Newtown.

Pingala's flagship project is a 29.9 kW solar PV system on the roof of Young Henrys, a craft brewery in Newtown. The project was made possible through activating the local community to invest in the project. The project received the Inner West Business Energy Smart Environment Award recognising its contributions made by local businesses to become more sustainable (Inner West Council, 2018).

Pingala also has a partnership with The Valley Centre, working with three Aboriginal communities in remote northern NSW to facilitate community energy projects.

Pingala is involved in the ARENA Social Access Solar Gardens project and is promoting this opportunity for community participation to their networks.

Furthermore Pingala has also recently launched a Solar & Battery bulk buy campaign in collaboration with Solar Citizens, GetUp!, 350.org and ShineHub. Pingala has organised a number of events across Sydney to help households take up solar and batteries at discounted prices (Shinehub, 2018).

Promoting and supporting Pingala's efforts in the Inner West LGA would provide a great opportunity to engage people in community energy.

Inner West Community Energy

Another local community energy group is Inner West Community Energy, who promote energy efficiency and renewable energy to locals including businesses and community organisations. They provide information and facilitate and conduct the installation of individual solar PV household solutions (Inner West Community Energy, 2018).

Renewable Energy Inner West (REWIRE)

This community energy group was founded by volunteers in 2015. The group was working to get a community investment project up on a progressive business in the Inner West, however due to insufficient support, volunteer time and complexity, the project did not proceed. The group shut down in 2016 as it was struggling to make its model work while lacking sufficient resources and support and experiencing increasing volunteer fatigue and frustration.

Positive Charge – Our Energy Future

The Our Energy Future program emerged from a collaboration between SSROC and eight councils including Inner West Council. The initiative was launched in 2017 and offers recommendations on energy efficiency solutions and renewable energy technologies like solar panels and batteries, along with referrals to vetted suppliers and products. It is implemented by the social enterprise, Positive Charge, and provides advice, services and products to households and businesses through workshops, phone calls and online enquiries, providing obligation-free advice and referrals.

An opportunity to extend the Our Energy Future program would be to support community organisations in Inner West Council area like Positive Charge has done for councils in Victoria. This is particularly useful since community organisations often don't have capacity and skills to assess solar quotes and lack trust in suppliers. For example the community group Milparinka (Brunswick) received support through Positive Charge by obtaining quotes and advice on the best suitable system. This group works with people with disabilities and was ultimately able (with a grant from Powershop) to install a solar system (Our Energy Future, 2018).

Stucco

Stucco, a Sydney University student housing cooperative, has demonstrated how photovoltaic and battery storage installation works in the context of multi-unit residences. The system of 114 panels and 36 batteries was installed in December 2016 and provides 80% of the residents' energy needs. Each student is expected to save up to \$35 per month on their electricity bills (\$420 per year). The project was enabled by a \$80,000 grant from the City of Sydney and sinking funds and "grassroots community efforts" of voluntary contributions and pro-bono work (Stucco, 2018).

SunTenants

An offspring of the Stucco initiative, SunTenants is a new social enterprise located in Chippendale Sydney which offers solutions to residential and commercial rental properties to overcome the landlord-tenant dilemma (otherwise known as split incentives). To this purpose, SunTenants offers a guided process for the landlord/owner and tenant that allows rent to be increased by mutual agreement in exchange for the electricity bill savings the tenant receives from having a solar system on the property (SunTenants, 2018).

Better Power Projects

Powershop's Better Power Projects is an initiative in conjunction with GetUp to encourage support for solar projects in NSW, Queensland and Victoria. In the Inner West, the Addison Road Community Centre Solar Project was selected and saw Powershop fund rooftop solar for the community centre (Powershop, 2018). Better Power Projects is considered community, energy even though a commercial entity is a project partner, because it is driven by a not-for-profit organisation and directly benefits community organisations.

CORENA

The Citizens Own Renewable Energy Network Australia Inc. (CORENA) is a not-for-profit organisation that operates Australia-wide and offers low or no interest loans in a donation based revolving fund to

support local community organisations to install solar PV or energy efficiency (see Appendix 1) (CORENA, 2018).

4. Analysis of community energy options

Table 5 provides a summary of the community energy options outlined in detail in Appendix 1.

The criteria for assessing the viability, feasibility and desirability are:

- *Speed of implementation* - short (within the next 6 to 18 months), medium (18 months to 30 months) and long term (more than 30 months);
- *Visibility and outreach* is related to the expected impacts and exposure of the initiative to stand out in a crowded market of local, regional and national activities. It is focussed on brand recognition, raising public awareness, driving public engagement and ultimately helping to increase trust in Council activities. The three levels are low (little and very localised impact) medium (fair amount of public involvement and awareness creation) and high (great potential for broad public participation, and to increase brand recognition);
- *Direct kW/ CO2 impact* stands for the potential of the initiative to directly generate a low (less than 50kW), medium (51 kW – 250 kW) or high amount (greater than 250kW) of kW hours of renewable energy generation and energy savings and so contributing to emissions reduction;
- *Social inclusiveness* refers to the capacity of the initiative to address systemic barriers and actively include people in the Inner West Council area who currently cannot access renewable energy generation such as renters, low-income households and homeowners with unsuitable roofs. The three categories are low (little to no capacity to include disadvantage groups), medium (some capacity to include disadvantaged groups) and high (great potential to include a broad audience including disadvantaged and marginalised groups).

The potential of any initiative to address the above criteria depends on its design and implementation. These criteria should be considered as guidance in discussion and consideration of the recommendations.

Table 5: Summary of community energy options

Models	Projects	Short Description	CPA assessment
Investment model	Community investment projects	Community initiated renewable energy projects that are funded by community investors, on the expectation that these investors will receive a certain return on their investment.	<i>Speed of implementation:</i> Short to medium <i>Visibility/ outreach:</i> Medium to high <i>Direct kW/ CO2 impact:</i> Low to medium <i>Social inclusiveness:</i> Low to medium <i>Overall IW:</i> Employ a staff member to help recruit businesses to community solar programs. Open up at least one Council roof to be the host site for a community investment project.
	Donation based model	Small scale crowdfunded projects for community organisations.	<i>Speed of implementation:</i> Short <i>Visibility/ outreach:</i> Medium <i>Direct kW/ CO2 impact:</i> Low <i>Social inclusiveness:</i> n/a <i>Overall IW:</i> Through promoting existing initiatives and spreading the word to encourage similar activities in the local area.
	Revolving fund	Funds raised are not used for a single renewable energy or energy efficiency project, but to provide zero interest loans to non-profit organisations.	<i>Speed of implementation:</i> Short to medium <i>Visibility/ outreach:</i> Medium to high <i>Direct kW/ CO2 impact:</i> Medium (depending on the funding and lifetime, the ultimate sum of all projects could have high impact) <i>Social inclusiveness:</i> Depending on the design – could be medium to high <i>Overall IW:</i> Employ a staff member and set up a revolving fund – start by targeting NFPs and consider expanding in the second year (e.g. to low income households).

Aggregated household model	Bulk Buy projects	Aggregate power of community buyers to purchase (a) product(s) at a discounted price.	<p><i>Speed of implementation:</i> Short to medium</p> <p><i>Visibility/ outreach:</i> Medium to high</p> <p><i>Direct kW/ CO2 impact:</i> Medium</p> <p><i>Social inclusiveness:</i> Low</p> <p><i>Overall for IW:</i> Initiatives are already underway. Promote existing efforts rather than compete.</p>
	Solar Gardens	Solar PV system located off-site and the household receives a financial benefit on their bill.	<p><i>Speed of implementation:</i> Medium</p> <p><i>Visibility/ outreach:</i> High</p> <p><i>Direct kW/ CO2 impact:</i> Depends on the size of the solar garden</p> <p><i>Social inclusiveness:</i> High</p> <p><i>Overall for IW:</i> Pilot a solar garden with a local partner (e.g. Pingala) and/ or other councils. Advocate for a state wide rebate to make solar gardens accessible for low income renters.</p>
	Apartment microgrids	Embedded electricity networks, which serve multiple premises.	<p><i>Speed of implementation:</i> Medium to long</p> <p><i>Visibility/ outreach:</i> Medium</p> <p><i>Direct kW/ CO2 impact:</i> Medium</p> <p><i>Social inclusiveness:</i> Depends on the initiator – could be high</p> <p><i>Overall IW:</i> Encourage housing operators, community housing providers, strata managers in the Inner West to consider embedded networks. Change planning regulation and approval process for new developments requiring apartment renewable microgrids.</p>
	Precinct microgrids	Embedded network on precinct/ community level.	<p><i>Speed of implementation:</i> Medium to long</p> <p><i>Visibility/ outreach:</i> Medium to high</p> <p><i>Direct kW/ CO2 impact:</i> High</p> <p><i>Social inclusiveness:</i> Depends on location could be high</p> <p><i>Overall IW:</i> Pilot project, change planning instruments and approval process for new developments</p>
	Rates-based finance	Finance for clean technologies is mediated through Council through special charges or rates levied on the property.	<p><i>Speed of implementation:</i> Medium to long</p> <p><i>Visibility/ outreach:</i> High</p> <p><i>Direct kW/ CO2 impact:</i> High</p> <p><i>Social inclusiveness:</i> Medium to high</p> <p><i>Overall IW:</i> Not possible in NSW yet, changes to Local Government Act required. Council could advocate with other councils to drive change</p>
	Developer partnership model	Off-site PPAs with community investment	<p><i>Speed of implementation:</i> Medium to long</p> <p><i>Visibility/ outreach:</i> High</p> <p><i>Direct kW/ CO2 impact:</i> High</p> <p><i>Social inclusiveness:</i> Low to medium</p> <p><i>Overall IW:</i> If Council is entering into negotiations for PPAs with a new large solar or wind farm then include a provision to open up to partial community ownership for Inner West residents.</p>

Some of these models could be implemented in collaboration with other councils. A collaboration has the advantage of sharing resources such as funding, knowledge and skills.

Supporting Programs

In addition to championing these models of community energy, Council could put in place programs that support multiple models of community energy. For example, develop a community energy grants program and/or establish a Community Power Hub.

Community Energy Grant Program

A Community Energy Grant Program (CEGP) would provide grants to local initiatives and organisations in order to undertake or promote community energy activities and initiatives, including renewable energy generation and energy efficiency measures.

The Community Energy Grant Program could have several streams, for example:

- Grants for community energy project feasibility studies;
- Grants for capacity building and education of locals to engage in community energy activities;
- Grants for schools and other community organisations to access programs currently out of their reach and not covered by public funding; and
- Grants for initiatives that are not strictly charitable, such as supporting a new small business to develop a sound business plan, helping them with start-up or expansion costs (or the initiation of an apartment microgrid).

Each year, the CEGP would distribute a portion of funds to eligible applicants whose proposals deliver local (and, ideally, lasting) benefits. Grant rounds should open one or two times per year and be available to community organisations, clubs, and businesses.

As with any grant program, there would be a need for clear guidelines and eligibility criteria, and would require ongoing administration and promotion.

Regional Energy Hubs

Regional Energy Hubs are organisations that leverage the efforts of existing community energy volunteers, contributions from the private sector, government funding and community enthusiasm for renewables to support access to clean energy technologies such as solar and battery storage.

Hubs would have staff with technical, legal, community engagement and finance expertise, and work to develop partnerships with funders, technology providers and other stakeholders. They would develop a range of new renewable energy business models that would deliver a just and speedy transition to clean energy. They would also provide support and advice to local actors such as community energy groups and small business.

Hubs would be connected to regional institutions such as councils and regional development organisations and would deliver programs that were relevant to their region. They would also be connected through a state-wide, and ultimately national, network to ensure that the lessons learnt in one region do not have to be re-learnt elsewhere.

The primary aim of the Hubs would be to unlock community energy projects. A well-designed Hub and support program could also address a range of barriers to a fair transition to clean energy, including:

- Access to a source of **impartial and trusted advice** on clean energy solutions. There is a lot of complexity, confusion and imperfect information in the energy space. The clean energy industry is relatively new and as such there is little understanding of what constitutes a suitable quality product or service. In addition, trust in energy retailers fell to 39% in 2018 (AEMC, 2018). Households, businesses and other consumers wanting to participate in the clean energy revolution are therefore unsure of who to turn to for good advice. A Regional Energy Hub could play this role.
- **Overcoming fundamental market barriers.** There are fundamental market barriers in the energy system that have stumped policy makers for years. These include:
 - Split incentives faced by renters, where neither landlord nor tenant accrue sufficient benefit from installing solar or energy efficiency measures to warrant doing so, leaving renters with ever increasing energy bills.
 - High upfront costs, where low-income households typically cannot afford the outlay for many clean energy options even though they would save money in the longer term. Available finance products are typically not appropriate as either the interest rates are too high or the low-income household is not eligible due to credit rating issues.

The good news, as outlined earlier in this report, is that there are community energy options that can overcome these barriers, from social access solar gardens to rates-based financing.¹ The bad news is that these options come with their own set of challenges, namely higher complexity and thus high transaction costs. These socially beneficial options of clean energy involve multiple partner organisations, adding transaction costs, which in turn means these options are more expensive for end

Moreland Energy Foundation

There are many community energy enterprises implementing innovative community energy projects and programs, but Moreland Energy Foundation is the longest running and a model many communities are trying to emulate.

Moreland Energy Foundation (MEFL) was founded as an independent NFP in 2000 by Moreland Council with revenue from the forced privatisation of the council-owned Brunswick Electricity Supply Department. The Brunswick Electricity Supply Department pioneered a range of world-leading energy efficiency and clean energy programs in the 1980s and MEFL continues that legacy to this day. MEFL is Australia's leading organisation in the implementation of clean energy programs that deliver real value to councils, communities, businesses and households, particularly low-income households.

For example, in partnership with Darebin Council and Energy Matters, MEFL implemented Australia's first residential rates-financing program for solar. The Darebin Solar Savers project installed solar on 300 low-income pensioners' roofs in Darebin (a suburb of north Melbourne). The participating households were better-off from day one. They paid zero upfront for the solar and pay back the cost through their council rates over 10 years, with the additional rate payments coming to less than the savings on their electricity bills.

users. In addition, these options require a duty of care to vulnerable households and require significant face-to-face time to build trust. These options are unlikely to be delivered by the market alone. However, a Hub could be tasked with coordinating and supporting the delivery of these socially beneficial options of clean energy.

Box 4: Moreland Energy Foundation – a Regional Energy Hub in practice

Community Power Agency has been advocating for the establishment of 50 Regional Energy Hubs across Australia as part of a new state-wide or national Smart Energy Communities Program (Community Power Agency, 2018). There has been some success to date, with the NSW and Victorian Governments developing smaller versions of the program and the Federal ALP and Greens adopting the policy of supporting the expansion of community renewable energy (ALP, 2018; State Government Victoria, 2018; The Greens, 2018). The program is modelled on funded volunteer coordination services provided through the National Landcare Program.

5. Recommendations

The following four community energy options were selected in a workshop with council staff on the 25th September 2018. The options are presented in detail with specific recommendations for implementation below.

1. Community investment projects
2. Revolving Fund
3. Solar Gardens
4. Apartment microgrids

If Council wishes to establish itself as a leader in community energy, we recommend Council focus its efforts on Options 1 to 3. Option 4 should be considered as an additional action that would build on

¹ See the Renewables for All project - www.cpagency.org.au/renewables-for-all-resources for case studies of these and other models of socially beneficial clean energy provision.

Council's existing strengths. All options require additional resources and it should be noted that the implementation will take more than 6 months. Moreover the Solar Garden option particularly involves a certain degree of risk, but would make Council stand out as a pioneer in the Australian renewable energy space.

Community Investment Projects

Description

Community energy investment projects are one of the most common types of community energy project in Australia. The community organisation, which could be a trust, public/propriety company or cooperative, sets up a renewable energy project (usually in the size between 10 to 250kW) funded by community investor-members, on the expectation they will receive a certain return on their investment. There are usually up to 20 investor-members per project (except for cooperatives which can have more investor-members). The community organisation will identify and negotiate with a host-site, an organisation that is interested in installing solar and interested in partnering with a community energy group. The community organisation, following successful negotiation, enters into a lease, loan or PPA arrangement with the host site of the renewable energy asset. The community organisation can own, maintain and manage the asset and at the end of its lifetime gift it to the host. The host could be a Council building with a suitable daily electricity demand (load).

In Australia most community investment projects are rooftop solar projects on commercial buildings operating behind the meter and below the load (see Box 3 for explanation). This ensures that the projects are viable and investors receive a reasonable return on their investments.

Impact/ outcome

Community investors will receive a return on their investment. Host site will have lower electricity bills and its environmental footprint will be reduced. The community engagement can also create a stronger sense of community and connectedness in the area. Many of these projects would also help to address Council's goal to work towards a zero emissions community.

Strength in the Inner West context

Progressive, industrial, small to medium sized organisations (businesses) with mid-sized roofs have great potential to serve as host sites for community energy investment projects. There are already two community energy organisations operating in Inner West Council area. With some support, both could initiate and implement further community investment projects.

Challenges in Inner West context

The greatest challenge is to find suitable and willing host sites for community investment projects.

Recommended role of council

Council's role in community energy investment projects could include: facilitate the work of existing organisations, become a host and increase its own promotion efforts of community energy initiatives and related Council activities.

Steps to support more community energy investment projects in the Inner West:

Step 1: Get started. Invite Pingala and Inner West Community Energy and learn what they are working on and identify their needs and requirements.

Step 2: Dedicated staff. Assign and fund a dedicated champion/ staff-person to progress and foster the local community energy initiatives and activities. Entrust this staff person with the following tasks:

- **Establish a host site register and broker relationships.** The new staff person should seek out and meet with local businesses, provide advice on renewable energy and energy efficiency (promoting Our Energy Future) and collect expressions of interest for establishing business owned clean energy projects or interest in a community-energy partnership (e.g. hosting a community energy project). The staff person should register these businesses in a repository including their intents. She/he should help broker the relationship between businesses and community groups. For example, Moreland City Council has supported Moreland Energy Foundation to establish a position dedicated to visiting local businesses, promoting MELF/Positive Charges services and brokering relationships to install solar PV in community partnerships.
- **Identify Council host site.** The staff person should check if any of Council's properties could serve as host site for a community investment project. If this is an option, a solar farm could be established similar to the Lismore model (see Appendix 1, Investment Model). It is recommended

that Council seek advice from Adam Blakester (Starfish Initiatives) and Sharyn Hunnisett (Lismore City Council) for further details.

Step 3: Grant funding. Set up a grant-funding program for feasibility and site assessments for community energy projects. The grants could also assist community groups to promote and conduct community engagement. The new staff person could administer the grant funding program.

Revolving No-Interest Loan Fund

Description

Over the last five years, CORENA's *Quick Win* program has demonstrated that revolving no-interest loan funds are an effective model of community energy. In this model, the funds that are raised through donations are structured as a revolving fund to provide zero interest loans for multiple projects. The revolving fund loans can be offered to local households, not-for-profit community groups, public buildings and businesses. As loans are re-paid, they can be reused to fund new projects.

The main benefits of the revolving fund model applied by CORENA are:

- Donations (crowdfunding) provide 'free capital'
- Recipients always pay back their debt since loans are repaid using the savings on a recipient's energy bills
- The quarterly loan repayments return to the revolving fund and along with new donations, more renewable energy and energy efficiency projects can be funded
- It works as a long term initiative because the donated money is never 'used up'

This model would work slightly differently if led by a council. Instead of seeking donations, Council could either take out a low-interest loan to use as the seed funding pool, or use Council reserves for a small pilot program. Council could easily build the interest cost (or the opportunity cost) into repayments from solar recipients and the scheme would still be very attractive, and if they do that, they too in effect have free capital in their revolving fund.

Impact/ outcome

Experience from CORENA shows that a starting funding pool of around \$210,000 could fund 10 community solar projects upfront with one new project every 6 months for the first 5 years, and then one new project every 3 months. After the first 5 years, all new projects should be fully funded by the loan repayments of previous projects (and not through donations). With \$630,000 in the funding pool, one new project every month could be funded, in perpetuity. This is a powerful self-funding model for more clean energy.

The potential impact/ outcomes include:

- Long-term funding program for local community projects which could include low income households, businesses and community organisations
- Increase energy literacy in the community
- Lower electricity bills and reduced environmental footprint
- Helping to meet Inner West's zero emissions community objective.

Council offering no-interest loans through a revolving fund would help to increase energy efficiency and renewable energy generation in the community, as well as increase energy education and awareness, thereby building Inner West Council's reputation as a sustainable energy leader.

Strength in the Inner West context

There is great potential for a revolving fund because the Inner West Council area is home to a large number of community organisations (see Table 4) and small businesses (see Table 3) who would appreciate the upfront loan funding and may find that the interest-free repayments can be easily paid back through savings on their energy bills.

Council has the potential to provide institutional back up and/or run and implement the fund themselves with administrative and financial management. In addition, councils have access to low or no interest loans (cheap capital), bulk buy prices and benefit from the economy of scale.

This initiative would support Council's zero emissions community objective and could allow Council to retire small-scale technology certificates (STCs) or large-scale generation certificates (LGCs) as a condition of projects being eligible for funding. This retirement of STCs and LGCs will help offset some of Council's emissions.

Challenges in the Inner West context

Any revolving fund would require seed funding for a new or existing organisation to set up the fund, or a long-term commitment from Council for the financial management & administration.

Recommended role of council

Step to starting a clean energy revolving fund:

Step 1: Getting started. Get in touch with CORENA (Margaret Hender) and potentially other councils (e.g. Adelaide City) and request details on their revolving fund establishment.

Step 2: Determine an implementation mode and identify its legal and financial requirements:
There are three options for how Council could implement the fund:

- Option 1 – The Fund is run and administered by Council.
- Option 2 – The Fund is run by an external newly set up organisation.
- Option 3 – The Fund is run by an external existing organisation.

To determine the way forward in relation to the three options, Council's legal and financial team or an external advisor should help to answer the following questions:

- Can Council issue direct loans to not-for-profit organisations and low income households?
- What are the risks, are these manageable and in line with Council bylaws?
- What would a viable and feasible business model for an internally- or externally-administered revolving fund look like?
- Does Council have the capacity and resources to administer the Fund internally? Could additional staff be hired to administer the fund and promote it?
- Where could the money for the initial funding pool come from – loan or Council reserves? How much could be afforded?
- If Council can't do it internally, could an existing organisation administer the fund or does Council want to support the setup of a new organisation?
- What issues have to be taken into account if Council would seed fund (as a loan or a gift) such an organisation to implement a revolving fund?
- How would existing Council promotion channels support this new initiative?

Step 3: Make a decision. Decide which of the three options should be progressed and prepare its implementation.

Step 4: Program Design. Determine the design of the program and the requirements for loan recipients (see below for suggested design features).

Step 5: Project Partners. Seek local partnerships with community energy organisations and other stakeholders to promote the program.

Step 6: Implementation: Establish the revolving fund and identify a flagship project for the first loan. Ensure there is a well-resourced communications plan to promote this flagship project so it starts to create demand.

The revolving fund program will need to consider the following design features. Based on conversations with CORENA we recommend:

- Recipients: while CORENA's revolving fund only includes not-for profit organisations, Inner West Council could use the fund to also support low income households, pensioners and small businesses.
- Cost for GST and interest: There are several options for Council to include or exclude the cost of GST and interest for the scheme participants – it will depend on the ultimate choice of the financing model.
- Payback time: Council might consider a longer term loan for pensioners and low income households (10 years), but set a short payback term for others (e.g. businesses only 5 years), to make the fund more cost-effective.
- Eligible technologies: solar PV and energy efficiency measures, as both are known to have a positive payback in most situations. The purpose of the revolving fund is not to help drive new technology, but rather scale-up and increase access to existing commercially available clean energy solutions.

- **Solar installation size:** medium sized systems (5-10 kW) are more cost effective. Darebin Council encourages households to install 5kW systems (if they fit their roofs and they have a large enough daytime usage) because they will save householders more over the lifetime of the system.

In addition, the program should be delivered in partnership with other state level energy efficiency programs to make sure the organisation(s) or individuals are getting the most out of their investments.

Solar Gardens

Description

The concept of a solar garden is based on installing a central solar array, generally near a populated centre, from which energy customers can purchase or lease panels. The electricity generated is then credited on the customer's electricity bill. The solar panels may be located off-site, but the household receives a financial outcome on their bill, a bit like having solar on their own roof.

A solar garden typically includes multiple organisations working in partnership – a retailer is essential to providing the bill-credit. A facilitating organisation such as a council or a community energy group is also typically needed, as well as a host site for the solar panels (note the host site does not need to purchase the electricity like in community solar investment models).

Solar gardens particularly seek to enable locked out, vulnerable and low-income energy users to participate in solar.

There are currently no solar gardens operating in Australia. However there are a number of organisations working hard to prove the concept and implement the first solar garden.

Impact/ outcome

The great benefit of a solar garden is that any electricity customer can participate in and access solar energy. This includes renters, apartment dwellers, and homeowners with shaded or unsuitable roofs.

Facilitating the set-up of a solar garden would present Council as an innovative leader in the renewable energy space. The model would address Councils' zero emissions community objective and act upon its guiding principles of social and environmental justice as specified in the Community Strategic Plan (Our Inner West 2036, p.13).

Depending on the design, the solar garden option can ensure equity (inclusion of vulnerable households), access (fair access for locked out energy users to RE benefits), participation (opportunity to include a large number of people) and equal rights (opportunity to encouraging people with diverse linguistic, cultural and religious backgrounds to benefit from this service).

Strength in the Inner West context

Inner West Council's Community Strategic Plan (*Our Inner West 2036*) emphasises the importance of social justice in Council's work (Inner West Council, 2018). This is particularly necessary since a large number of people are still excluded from the solar revolution since they are renting or do not have the financial means to access renewable energy technologies. The statistics confirm the need to act. In the Inner West Council area 36.9% people rent, and 3.5% live in social housing, and there are 19,115 low income households as at 2016 (.id community demographics, 2018).

The current ARENA feasibility project coordinated and managed by the Institute for Sustainable Futures and Community Power Agency tests the viability of solar gardens in selected locations in New South Wales, Victoria and Queensland. Inner West Council will have the opportunity to learn from the project findings and specific recommendations about how best to implement a solar garden.

It is important to note that the solar garden model is not yet proven in the Australian context, since there is no operating project yet. That said, there is a great appetite among stakeholders to make the concept work and significant groundwork to build on, which means Community Power Agency is confident that it is just a matter of time (and of course resourcing). For example, a number of retailers including Powershop are interested in supporting the implementation of solar gardens with councils or community groups. Pingala is also involved in the ARENA solar garden feasibility project and has gained expertise in, and is currently developing a prototype, solar garden business model.

Challenges in the Inner West context

There are some challenges associated with developing a solar garden. Specifically, ensuring the economic model is viable – covering costs and lowering bills for households. The model is also based on complex legal and contractual arrangements (e.g. land/ rooftop rights to access, grid connection process, lease and licence arrangement) that must be resolved before implementing the first project.

The Social Access Solar Gardens project (ISF, 2018b) is identifying the contracts that will need to be in place.

Recommended role of council

The Inner West Council could play an important role in the implementation of a solar garden because of:

- Access to available land/properties for installing the solar system,
- Institutional capability and knowledge,
- Trusted position in the community, and
- The focus on social inclusion.

Steps to develop a solar gardens program:²

Step 1: Getting started. Contact the Institute for Sustainable Futures (ISF) and Community Power Agency (CPA) to receive a quote for detailed overview and introduction to setting up a solar garden project. The assistance could take the form of a series of development workshops that would enable the Council to move to a solar garden pilot. ISF and CPA have led Australia's thinking and practice on solar garden development and implementation, starting with national research on Local Electricity Trading (ISF, 2018a), on Renewables for All (Community Power Agency, 2016), and are currently leading a national ARENA-funded project towards establishing up to five pilots of Social Access Solar Gardens (ISF, 2018b).

Step 2: Make a decision, and dedicate staff. Determine if you would like to move forward or not. If Council management decides to pursue the idea select or hire a Council champion (dedicated staff) who would see the project through development, implementation and have a significant role in leveraging Council-community engagement capacity.

Step 3: Project partners. Find a power retailer operating in your LGA which is interested in implementing the solar gardens model with you; reach out to other local stakeholders such as community energy groups (e.g. Pingala), community housing providers or businesses that could be interested collaborating and supporting the project development.

Step 4: Host site search. Check within Council about any feasibility studies done on solar PV for Council buildings, noting that a solar garden does not require a behind-the-meter load. If Council sites are unavailable, consider collaborating with other councils, businesses or other local or regional partners to access land or larger, suitable properties.

Step 5: Financial modelling. ISF could assist Council to undertake a financial assessment of a Council solar garden for selected target audiences, and configure an online financial assessment tool (developed as part of the Social Access Solar Gardens project) for a Council solar garden. Such an assessment tool would allow Council to test the financial viability of different solar garden scenarios.

Step 6: Market research. Identify the most suitable target group and undertake customer research on the level of interest in a solar garden among prospective purchasers, and how best to explain and promote the solar garden concept to customers in the Inner West LGA. Depending on the economics of your particular model this could be middle income renters or vulnerable households.

Step 7: Implementation. Conduct community engagement in collaboration with a local community energy group (e.g. Pingala), install the solar system and recruit your first customers, launch the project and promote it nationwide.

Depending on the chosen business model of your solar garden, there is an option to also facilitate the participation of low income households via low or zero-interest loans. This could be done in collaboration with community housing providers or community neighbourhood centres. For example community centres and the Salvation Army offers interest-free loans for people on low incomes of up to \$1,500 for essential items. It works through community credit, where the repayments are used to fund another community member. An option is for Council to offer seed funding for the loans which could be administered by local community organisations such as the Salvation Army.

It is important to note that developing a solar garden will likely require resourcing from Council beyond staff time. Funding will be needed for support with early-design work, legal assessment and market

² Note: Community Power Agency have recommended organisations that the authors are actively involved with. We do this as we are not aware of any other organisations that have done as much to understand how to develop solar gardens in Australia.

research. If there is a question of sufficient resources, Council could look to apply for grants or work in partnership with other councils to pool resources.

Apartment microgrids

Description

Apartment microgrids are embedded electricity networks, which can serve multiple premises – such as a block of apartments or an urban precinct on a single property title. This means instead of every unit (apartment, shop etc.) having its own connection point to the local network and its own retailer, the building has a single grid connection and manages the metering and billing of units internally. This helps reduce residents' costs by enabling the aggregated purchase of energy (wholesale price), and the utilisation of onsite generation of solar power, battery storage and electric vehicle charging.

An apartment microgrid is best planned and implemented in new property developments. However there are also examples of how to share the locally produced renewable energy by converting existing buildings into embedded networks.

The ownership and finance can be either private (by the developer) or collective (e.g. through a housing cooperative or public/ community housing such as Stucco). It has to be noted that due to its complexity most (apartment) microgrid arrangements are run by commercial clean energy companies or utilities for a group of households and organisations. While there are exceptions such as Stucco (Stucco, 2018), apartment microgrids should generally be considered a *citizen energy* arrangement driven by a commercial provider rather than a *community energy* initiative per se.

Impact/ outcome

By aggregating usage of all individual units within the development and incorporating an embedded network, an opportunity exists for the site's owner to make use of locally generated renewable energy or gain access to the wholesale energy market for a bulk electricity purchase. This will help to reduce the apartment dwellers' electricity bills and manage exposure to electricity price increases in the long term. For example an inner-city Sydney apartment complex, The Burcham, provides a way for residents to purchase energy at up to 20 per cent below the market's lowest retail cost.

In summary, the benefits are:

- Save tenants money;
- Create a new revenue stream for building owners;
- Help businesses minimise their carbon footprint, and;
- Improve security of energy supply

Strength in the Inner West context

The Inner West Council area has an above average share of medium to high density dwellings (73.4%) in comparison to Greater Sydney (44%).

Challenges in the Inner West context

This model requires body corporates to collectively agree to take action, this is the biggest challenge to making this model work. It is a time consuming process with no guarantee of success.

In addition, there are challenges associated with the current regulations that mandate consumers to be able to choose their retailer and not being exposed to monopoly power (as feared in an embedded network setting). This is ensured by the Australian Energy Regulator, which has consequently posed some big hurdles for the Stucco project. So they made a unique agreement that the co-op committed to cover fully the costs of installing a grid meter for any unit whose occupant wishes to exit the embedded network in the future.

There are also real concerns about some embedded network operators routing customers. These concerns can be managed through good tendering and good contractual arrangements that guarantee customer protection.

Recommended role of council

If Council is interested in supporting apartment dwellers to access solar there are a number of ways as outlined in Table 6.

Table 6: Options of supporting apartment dwellers to access renewable energy

Option	Characteristic	Pro	Con	Council's Role
1. Single	One solar system connected to	Simplest legally	Small system	Council's DA requires



system for common areas	the common areas. Provides power for lifts, HVAC, lights, garage fans, pools etc.	and technically	No solar for residents	solar PV for common area's electricity use in all new properties/ and refurbishments
2. Multiple systems, one per unit	Multiple solar systems on roof, each is individually connected to a unit. Potentially also a system for the common area. Provides power for each resident, serving their loads (e.g. fridges, AC, electronics etc.) with any excess sold to the grid.	Legally simple Technically unambiguous Service greater load (more solar) Residents save on bills	Additional upfront costs Issues around ownership Issue with renters i.e. split incentives	Council's DA requires solar PV for each unit in any new property
3. Apartment microgrid - single system shared	Building becomes amalgamated so that the solar power from a single large solar system is shared amongst all residents and the common areas	Maximises solar system Maximises savings	Legally difficult Technically challenging Require specialist advice & service providers	Roll out a large pilot for apartments based on Stucco's experience Encourage private initiatives through grant funding program
4. Off-site Solar	Solar Garden arrangement as explained above	Access for renters	No system operating in Australia yet	Roll out Solar Gardens projects in the LGA

Source: Adapted from Sturmborg (2018).

Steps to establishing an apartment microgrid

Since the implementation of an apartment microgrid is a legislatively complex endeavour, we recommend that Council focusses on the following steps:

Step 1: Getting started. Get in touch with Dr Bjorn Sturmborg and/or his business partners from Stucco, and request further details on the apartment microgrid establishment in particular about the regulatory and legal requirements.

Step 2: Determine the role of council: Decide what role Council would like to play in the establishment of apartment microgrids: run a pilot project and/or facilitate through grant funding or regulation and the planning system.

Step 3: Focus on planning change: We suggest that Inner West Council focuses on changing its planning regulation to require any new multi-dwelling development to have solar, likely through an apartment microgrid:

- Engage with respective departments in Council and determine ways how this could be implemented;
- Promote the idea with Councillors and get their support; and
- Promote it to the community as another sustainability initiative of Council to meet its goal to become a zero emissions community.

Promotion, education and capacity building

Regardless of the option(s) that Council chooses to pursue, it is recommended that Council complement any CRE option with promotion, education and capacity building of existing Council initiatives and local community energy activities in the LGA.

Promoting local community energy activities as well as existing activities is important for informing, educating and engaging the Inner West community about existing community energy initiatives. A targeted approach is required to do this effectively. Council has great capacity to reach out to local households through newsletters, local events, social media, the local newspaper, and at regular stalls at markets. We also understand Council has existing networks with local organisations and businesses. All of these channels can be used to better support and amplify existing community energy projects and programs.

The communication or media department in Council could provide the institutional back up to support these efforts.

With the Green Living Centre and Our Energy Future initiatives, Inner West Council already has a great platform to conduct engagement, education and knowledge sharing measures. These initiatives could be extended and utilised to also reach low income households and the many community organisations and small businesses in the Council area.

Steps for doing more to promote community energy:

1. **Establish a repository of local energy initiatives:** collate information about all local clean energy related initiatives in your LGA and their initiators (including email contacts) in a central public repository and keep it up-to-date. This should include regular meetings with Pingala and other community energy organisations to receive their latest news and developments in the community energy sector. The repository could be used for promoting and informing about the latest RE initiatives from Council and the community.
2. **Escalate and expand the promotion of existing initiatives,** specifically Our Energy Future and Green Living Centre's clean energy services: Set up a detailed communication strategy to promote and inform about Council's existing initiatives and how people can get engaged. The strategy should include additional events and weekly or more frequent stalls to promote and engage people in Our Energy Future program. It should also include further efforts to promote the Green Living Centre's workshops and training. This could comprise reaching out and promoting the services to specific groups in the community including those with little proficiency in English and low income households. Consider a section on community energy in your newsletter.
3. Make sure that all Council communication about renewable energy encompasses information and details about the concept of community energy, why it is important and what Council is doing.
4. In addition: in collaboration with the other SSROC councils extend Our Energy Future/ Positive Charge's services to also include low income households and cover their costs.
5. **Support and promote community energy groups:** If Council is regularly meeting with community energy groups, this information should be the basis of additional promotion by Council of these initiatives through stalls, newsletters, social media, events, info-sessions and more. Council can also support community energy groups by offering other in-kind support such as access to rooms, and facilities.

Council could also consider advocating for a future National Community Energy Congress to be held in Sydney.

References

- .id community demographics. (2018). Inner West Council area. Retrieved September 19, 2018, from <https://profile.id.com.au/inner-west/about?WebID=10>
- ALP. (2018). Climate Change Action Plan. *Website*. Sydney: Australian Labor Party. <https://doi.org/10.1016/B978-1-85617-834-1.10008-0>
- Australian PV Institute. (2018). SunSpot. Retrieved September 15, 2018, from <http://pv-map.apvi.org.au/sunspot>
- C4CE. (2015). *National Community Energy Strategy*. Sydney.
- Clark, T. (2015). Energy giants more disliked than banks, poll finds. *The Guardian Website*. Retrieved from <https://www.theguardian.com/money/2015/jan/26/energy-giants-more-disliked-banks-guardian-icm-poll>
- Climate Council. (2018). Cities Power Partnership Inner West Council is a Power Partner. Retrieved September 19, 2018, from <https://citiespowerpartnership.org.au/partners/inner-west-council/>
- Community Power Agency. (2016). Renewables for All – Resources. Retrieved October 15, 2018, from <http://cpagency.org.au/renewables-for-all-resources>
- Community Power Agency. (2018). Smart Energy Communities Campaign. Retrieved October 15, 2018, from <http://cpagency.org.au/campaigns/>
- CORENA. (2018). Solar revolving fund for Local Councils – Key Points. Retrieved September 15, 2018, from <https://corenafund.org.au/clever-climate-economics-for-local-councils/>

- Green Living Centre. (2018). Green Living Centre Workshops. Retrieved September 15, 2018, from <https://www.greenlivingcentre.org.au/events/>
- Inner West Community Energy. (2018). Promoting renewable energy in Sydney's Inner West. Retrieved September 15, 2018, from <https://innerwestcommunityenergy.org.au/>
- Inner West Council. (2017). Minutes of Ordinary Council Meeting held on 24 October 2017. Retrieved September 15, 2018, from https://innerwest.infocouncil.biz/Open/2017/10/C_24102017_MIN_WEB.htm
- Inner West Council. (2018). Are any approvals required? Retrieved October 5, 2018, from <https://www.innerwest.nsw.gov.au/develop/development-applications/are-any-approvals-required>
- Inner West Council. (2018). Business Environment Awards. Retrieved September 15, 2018, from <https://www.innerwest.nsw.gov.au/live/environment-and-sustainability/sustainability-programs/business-and-environmental-awards>
- Inner West Council. (2018). Media Release - Council makes going solar easy. Retrieved September 15, 2018, from <https://www.innerwest.nsw.gov.au/about/news/media-releases/2018-media-releases/council-makes-going-solar-easy>
- Inner West Council. (2018). *Our Inner West 2036 - A community strategic plan for the Inner West community*. Sydney. Retrieved from <https://www.innerwest.nsw.gov.au/about/the-council/corporate-planning-performance-budget/our-inner-west-2036-community-strategic-plan/community-strategic-plan>
- ISF. (2018a). Facilitating Local Network Charges and Local Electricity Trading. Retrieved October 15, 2018, from <http://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate-2>
- ISF. (2018b). Social access solar gardens. Sydney: Institut for Sustainable Futures. Retrieved from <https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate/social-solar-gardens>
- Ison, N., Ross, K., Cooper, C., Brennan, T., Langham, E., Wynne, L., ... Downes, J. . (2013). *Our Energy Future. Our Energy Future: SSROC RENEWABLE ENERGY MASTER PLAN*. Sydney. <https://doi.org/10.1002/9780470473795.ch1>
- Mey, F., Diesendorf, M., & MacGill, I. (2016). Can local government play a greater role for community renewable energy? A case study from Australia. *Energy Research & Social Science*, 21, 33–43. <https://doi.org/10.1016/j.erss.2016.06.019>
- Our Energy Future. (2018). Community groups go solar. Retrieved September 15, 2018, from <https://ourenergyfuture.org.au/news/2017/03/community-groups-go-solar/>
- Our Energy Futures. (2018). Our Energy Futures. Retrieved September 15, 2018, from <https://ourenergyfuture.org.au/>
- Pingala. (2018). Pingala - Fairer Energy. Retrieved September 15, 2018, from <http://pingala.org.au/>
- Powershop. (2018). Better Power Projects terms and conditions. Retrieved September 15, 2018, from <https://www.powershop.com.au/better-power-projects-terms/>
- Shinehub. (2018). Sydney Community Solar Program. Retrieved September 15, 2018, from https://shinehub.com.au/sydney?lead_source=Pingala
- Starfish Initiatives. (2018). Community Solarfarm Loan Model. Retrieved September 9, 2018, from <http://farmingthesun.net/lismore/business-model/>
- State Government Victoria. (2018). Community Power Hubs. Retrieved October 15, 2018, from <http://www.communitypowerhub.com.au/>
- Stock, P., Rice, M., Hughes, L., Pearce, A., Hussey, K., & Flannery, T. (2017). *Local Leadership: Tracking Local Government Progress on Climate Change*.
- Stucco. (2018). Stucco's Solar System. Retrieved September 15, 2018, from <http://www.stucco.org.au/solar>
- Sturmberg, B. (2018). Solar Power & Apartments Opportunities for Body Corporates. Retrieved October 15, 2018, from https://drive.google.com/file/d/0B_489VqCJdXvTmNwZC00SUvtUXM/view
- SunTenants. (2018). We make solar work for rentals. Fair and simple. Retrieved September 15, 2018, from <https://www.suntenants.com/>
- The Greens. (2018). The Greens plan to support Community Owned Renewables. Retrieved October

15, 2018, from <https://greens.org.au/sites/default/files/2018-06/Community Owned Renewable Energy Initiative.pdf>

Totally Renewable Yackandandah. (2018). The Yackandandah Mini Grid Future. Retrieved October 15, 2018, from <http://totallyrenewableyack.org.au/2017/03/the-yackandandah-mini-grid-future/>

Appendix 1

List of existing models and recommendations

Investment Models

1. Investment projects		Investment Models
Description	<i>See main body of the report.</i>	
Impact/ outcome	<i>See main body of the report.</i>	
Strength in the Inner West context	<i>See main body of the report.</i>	
Challenges in Inner West context	<i>See main body of the report.</i>	
Role of council	<i>See main body of the report.</i>	
Speed of implementation	Short to medium	
Case study examples	<p>Lismore Community Solar farm is an investment model as well as a community-council partnership model. Proprietary companies are established as special purpose vehicles/entities (SPVs) for each project. The model has been developed for situations where the council is the customer. Community investment will provide a loan to fund the build of the solar farms, which will be owned by the Council and they will use all electricity generated on site. Council will repay the investors with interest to the community companies for a period of seven years followed by a 'bullet' repayment of capital in full at the end of the loan.</p> <p>This community solar farm model was developed especially for two 99kW projects in partnership with Lismore City Council. They are the first community-funded and council-operated solar farms in Australia. The minimum investment amount was 90 shares/ \$9,000. A number of 1,800 shares were offered to a maximum of 20 shareholders for each of the two systems (Starfish Initiatives, 2018).</p> <p>Lismore City Council worked through a range of necessary legal reviews, including clearance from the NSW Office for Local Government, which provides a valuable assurance of the legality of this model for other collaborations with local councils. The model is especially well suited to small-sized community energy projects of up to around 100kW in size. It can also be used to fund energy efficiency upgrades. The use of a loan-based financial structure results in relatively simple and minimal requirements in terms of governance, financial, legal, compliance and administration.</p>	
Sources/ resources	<p>Lismore Community Solar</p> <p>Link: http://farmingthesun.net/lismore/ and http://farmingthesun.net/lismore/business-model/</p> <p>Other investment projects have been developed by:</p> <ul style="list-style-type: none"> • Clear Sky Solar • Pingala • Repower Shoalhaven <p>Another useful resource providing an overview of the different models is:</p>	

Donation Models

2. Donation	Donation Models
Description	<p>A very successful community renewable energy approach is the donation-based model. This approach involves a community raising funds through donations to install renewable energy or undertake energy efficiency measures. Typically, the host site and beneficiary of this model is a community organisation such as a school, surf-lifesaving club, fire station, neighbourhood house etc., who would ultimately own the asset. The money is raised through public crowdfunding campaigns and/or through more traditional fundraising methods. The installation could be either covered through the fundraising or as pro-bono work.</p> <p>Since these projects are usually small (5-50kW solar PV or solar hot water) and easier to deliver, they have been used by many community energy groups as a first initiative.</p>
Impact/ outcome	<p>A community organisation will become the owner of a clean energy asset that will help to reduce their electricity bill and their environmental footprint. The initiative will increase the community awareness about environmental and energy issues and solutions. In the sense of “by the community for the community”, it can support a feeling of community connectedness and engagement.</p>
Strength in the Inner West context	<p>Inner West Council area is home to a large number of not-for-profit organisations, specifically from the health sector (who have greater energy needs than other sectors), which would be suitable beneficiaries.</p> <p>There are many fairs and sustainability events in the Inner West Council area that could be used to promote a donation-based project (e.g. Footprints EcoFestival). The Green Living Centre could also host events and/or promote projects.</p>
Challenges in Inner West context	<p>There is great competition in the crowdfunding space with many organisations advertising for their good causes. Hence it is important to the success of such a crowdfunding initiative that there is a local community that has associations/ affiliations with the respective organisation, that the community understands the work and needs of the organisation and sees the value added through the new clean energy assets.</p> <p>Donation based community energy initiatives are often run by volunteers, which can lack capacity and resources.</p>
Role of council	<p>Council could promote donation projects in the LGA and also offer to match funding through community grants.</p>
Speed of implementation	<p>Short to medium</p>
Case study examples	<p>Repower Shoalhaven is a volunteer-based and founded not-for profit organisation in the Shoalhaven area. They develop community solar projects for business and individuals to participate in. Their first solar PV project (9kW) was a donation base initiative for the Kangaroo Valley Community Centre and Ambulance Station in 2014. In collaboration with the Lions Club they raised \$10,000 from 32 community members to pay for the system.</p> <p>The Hunter Wetlands Solar project was one of Clean Energy Association of Newcastle and Surrounds (CleanAs) first initiatives. The project raised \$19,500 funds and a further \$19,000 of matched funding as part of the 2015 Newcastle Stronger Community Grants to enable the installation of 90 solar panels and some energy efficiency retrofits.</p> <p>Powershop’s Your Community Energy Initiative gives customers the opportunity to pay higher power rates to be contributed to renewable energy projects that are community-owned. A number of projects have already benefitted from Powershop’s contribution including Milparinka Centre (Victoria), Castlemaine Childcare Centre (Victoria), Moyola Lodge (Victoria), Mid Mountains Neighbourhood Centre (NSW) and Buckets Way Neighbourhood Centre (NSW).</p>
Sources/ resources	<p>Small Scale Solar Guide: http://c4ce.net.au/strategic-initiatives/webinars-2017-small-scale-community-solar-guide/#donation</p> <p>Link: https://www.repower.net.au/projects.html</p>

Link: <http://www.cleanas.org.au/hunter-wetlands-solar.html>

Link: <https://www.powershop.com.au/your-community-energy/>

3. Revolving Fund		Donation Models
Description	See main body of the report.	
Impact/ outcome	See main body of the report.	
Strength in the Inner West context	See main body of the report.	
Challenges in Inner West context	See main body of the report.	
Role of council	See main body of the report.	
Speed of implementation	Medium	
Case study examples	<p>CORENA has pioneered and implemented the revolving fund model in the Australian community energy sector since 2013. CORENA is a not-for-profit group with nation-wide membership. Their revolving fund initiatives are called Quick Win projects which provide interest-free loans to non-profit community organisations in all parts of Australia. To date CORENA has implemented 24 projects with a value of \$323,000 with a total capacity of 211 kW.</p> <p>Link: https://corenafund.org.au/quick-win-projects/</p> <p>Solar Savers Model, used by Darebin, Adelaide, and some other Victorian local councils, could be considered a form of revolving fund but is specifically enabled through rates based re-finance. Please see rates based finance, below.</p>	
Sources/ resources	<p>Link: https://corenafund.org.au/clever-climate-economics-for-local-councils/</p> <p>Link: http://www.darebin.vic.gov.au/Darebin-Living/Caring-for-the-environment/EnergyClimate</p>	

Source: The information about revolving funds are based on CORENA's data and findings.

Aggregated Household Models

4. Bulk Buy projects		Aggregated Household Models
Description	<p>A community energy bulk buy is where a facilitating organisation aggregates the purchasing power of households to purchase clean energy product(s) at a discounted price. These products can include clean energy technologies such as solar PV systems and storage systems, and also energy efficiency measures such as solar hot water, insulation etc.</p> <p>The facilitating organisation, typically a community organisation or council, selects a trustworthy supplier/ and or installer, typically through a tender process, with the final system price being determined by acceptance of a tender application.</p> <p>Alternatively the facilitator may select a subset or panel of suppliers/ installers offers and allow the buyer to make the final decision on which supplier/ installer to go with.</p> <p>The community organisation or council only adopts the role of a facilitator while the ultimate ownership and finance of the systems would generally remain with the buyer.</p>	
Impact/ outcome	<p>Community bulk-buys make it easier and more affordable to households, businesses and other organisations to adopt clean energy technologies.</p> <p>The bulk buy also supports the decision making process, making it easier when community members are faced with a confusing array of product choices and don't know where to begin.</p> <p>Community members often receive substantially discounted material/ equipment as a</p>	

	benefit of the bulk-buying.
Strength in the Inner West context	In the Inner West there are already initiatives that support community members to get better deals when adopting solar PV and other energy efficiency solutions. The Our Energy Future Program was set up to do this in an ongoing capacity, rather than a time-bound bulk-buy. In addition, Pingala and ShineHub are currently running a solar and battery bulk buy campaign with events across the entire city.
Challenges in Inner West context	The fact that there are existing initiatives, means it does not make sense to add another activity in this space, but rather strengthen existing initiatives.
Role of council	Council could further promote the Our Energy Future Program and support Pingala's campaign by promoting the local events to their community and if needed facilitate further events if the appetite in the local community is great.
Speed of implementation	Short to medium
Case study examples	<p>Sydney Community Solar Program – coordinated and supported by Pingala, Shinehub, GetUp, 350.org, Solar Citizens and Smart Energy Council. Link: https://shinehub.com.au/sydney</p> <p>New England – Power Package bulk-buy – coordinated by Farming the Sun's and Starfish Initiatives in collaboration with Eco Energy & Solar Solutions (EESS) and resulted in a 2% increase of local solar PV installations. Link: https://farmingthesun.net/bulk-buys/solar-power-package-2/</p> <p>Mash – More Australian Solar Homes in Central Victoria has installed more than 950 solar PV systems with more than 4.2 MW installed capacity. Link: https://mash.org.au/</p>
Sources/ resources	<p>Embark Wiki</p> <p>Introduction to a bulk buy, setting up a bulk buy and promoting a bulk buy program</p>

5. Solar Gardens		Aggregated Household Models
Description	See main body of the report.	
Impact/ outcome	See main body of the report.	
Strength in the Inner West context	See main body of the report.	
Challenges in Inner West context	See main body of the report.	
Recommended role of council	See main body of the report.	
Speed of implementation	Medium	
Case study examples	<p>Social Access Solar Gardens – is an ARENA funded pilot project, managed and coordinated by Community Power Agency and the Institute for Sustainable Futures which seeks to prototype five Solar Garden models in Swan Hill in Victoria, Blacktown, Shoalhaven and Byron in NSW and regional Queensland.</p> <p>Link: https://arena.gov.au/projects/social-access-solar-gardens/</p> <p>Link: https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate/social-solar-gardens</p> <p>Enova’s Solar Gardens model – behind the meter</p> <p>Link: https://enovaenergy.com.au/solar-garden/</p>	
Sources/ resources	<p>The Social Access Solar Garden was derived from the ARENA and Victorian Government funded Moira and Swan Hill Local Energy Trading (LET) Project. This project virtually trialled a community solar farm, which was part of a bigger project led by ISF, <i>Facilitating the Introduction of Local Network Charges and Local Electricity Trading</i>. That project established that there was sufficient merit in the one-to-many LET model to warrant further and more detailed investigation.</p> <p>Links: https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate/social-solar-gardens</p> <p>https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate-3</p> <p>The Energy Consumers Australia funded <i>Renewables for All</i> project which identified a series of models and associated policy and regulatory reforms that would allow all Australians, no matter their income or living arrangements, to be able to directly benefit from clean energy solutions such as solar PV, storage and energy efficiency. Solar Gardens were identified as one of the key models in this project, which was led by CPA.</p> <p>Link: http://cpagency.org.au/renewables-for-all-resources/</p> <p>There are additional examples from several US states, where the idea originally stems from, enabled by their virtual net metering policy.</p> <p>Colorado has implemented one of the most publicized and recognized community shared solar program called Community Solar Gardens.</p> <p>Link: https://www.colorado.gov/pacific/energyoffice/community-solar</p> <p>Guide to Community Shared Solar:</p> <p>Link: https://www.nrel.gov/docs/fy12osti/54570.pdf</p>	

6. Apartment microgrids		Aggregated Household Models
Description	<i>See main body of the report.</i>	
Impact/ outcome	<i>See main body of the report.</i>	
Strength in the Inner West context	<i>See main body of the report.</i>	
Challenges in Inner West context	<i>See main body of the report.</i>	
Role of council	<i>See main body of the report.</i>	
Speed of implementation	Medium	
Case study examples	<p>Stucco, a small cooperative housing block in Newtown, has converted their building into an “embedded network”, whereby the building has a single grid connection and manages the metering and billing of units internally. They received an "Environmental Performance Innovation Grant" to the value of \$80,000. The solar project cost \$130,000 (\$97k for the technical system and \$33k in volunteer work and Stucco funds). The payback time was estimated at six to seven years.</p> <p>Stucco received support from Gilbert+Tobin who advised them on regulatory approvals and registrations required for the project, assisted with exemption applications to the Australian Energy Regulator, drafted the power purchasing agreements with members and advised on the implementation of the project within STUCCO's existing governance structure.</p>	
Sources/ resources	<p>Stucco: http://www.stucco.org.au/ https://www.suntenants.com/howitworks/</p> <p>International example of Apartment Microgrid enabled through the New York State Homes and Community Renewal</p> <p>Link: https://onestepoffthegrid.com.au/glimpse-energy-future-new-york-launches-affordable-housing-microgrid/</p>	

7. Community microgrid	Aggregated Household Models
<p>Description</p>	<p>Community-level microgrids have long been deployed in remote areas such as mining sites and island communities. Those solutions are increasingly being considered and adapted for residential communities, both in urban contexts and greenfield developments. A microgrid is defined as ‘a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that can act as a single controllable entity with respect to the grid’.</p> <p>They can be either grid-connected or standalone systems operating off-grid. It can include renewable electricity generation, storage, and (typically) smart energy management. Microgrids can operate independently, or in conjunction with the main electrical grid</p> <p>This rapidly emerging sector is of growing interest to a wide range of stakeholders including industry, energy utilities, regulators, policy makers, developers and communities.</p>
<p>Impact/ outcome</p>	<p>Microgrids operate as small, community level networks are capable of aggregating and optimising resources, using a combination of renewable energy generation, storage and communication and control technologies. They have the capability to manage local renewable energy generation and use appropriate tariff structures to benefit both the user and the network.</p>
<p>Strength in the Inner West context</p>	<p>Council’s goal of a zero emissions community makes it worthwhile considering precinct level approaches.</p> <p>The combination and integration of residential solar and battery storage, commercial solar, small-scale on-site solar farms and precinct-level storage including batteries could generate high impact in terms of kW installed and CO2 emissions reduced.</p> <p>Population and housing density and the large number of commercial buildings in the Inner West make community microgrids an opportunity for households and businesses that can’t install solar on their own roof to access affordable and reliable clean energy. This would help them to hedge against rising electricity cost.</p>
<p>Challenges in Inner West context</p>	<p>Challenges come with the implementation of the microgrid on community level, which will require significant resources.</p> <p>In addition to what is mentioned above there are some uncertainties regarding the regulatory environment (e.g. every customer should be able to choose its own retailer – there are issues of a monopoly situation in a microgrid) and the role of the Network Providers (conflict for them regarding the loss of revenue and assets) which have to be solved.</p>
<p>Role of council</p>	<p>Council could play a role as a grant funding body and set up a small program that enables social research to explore the appetite in the community and determine expectations, concerns and perceived benefits towards renewable energy based microgrids.</p> <p>Beyond that, microgrids can be a great asset in the future of energy supply for newly developed urban precincts. Council could make net zero precinct microgrid solutions (based on renewable energy and storage) a prerequisite for Development Approvals.</p>
<p>Speed of implementation</p>	<p>Long term</p>
<p>Case study examples</p>	<p>Note, most microgrids fit outside the definition of community energy as they are delivered by commercial actors. The main exception we know to this is the partnership between Totally Renewable Yackandandah (TRY) and Mondo Power.</p> <p>TRY has been working on establishing a local mini-grid for its entire community since 2014. Because of the collaboration with Mondo Power it was possible to already offer one Yackandandah neighbourhood a complete solar and battery mini grid solution. The first purchase offer in 2017 saw more than 550kW of solar generation added to the Yackandandah area. Mondo Power has launched a second proposition with the Yackandandah Starter Pack which includes Mondo™ Ubi™ an energy monitoring and management system, battery ready solar and inverters offered at interest free price (Totally Renewable Yackandandah, 2018). Mondo™ Power will contribute towards the battery costs to support the realisation of the mini grid in Yackandandah.</p> <p>Ginninderry Microgrid is a more commercial model. The Ginninderry microgrid will combine and integrate residential solar and battery storage, commercial solar, small-scale on-site solar farms and precinct-level storage including batteries and pumped hydro. Key stakeholders for Ginninderry’s microgrid are Riverview Projects (project managers), ACT Government LDA, Infrastructure Planning & Design and Energy Policy, Beast Solutions (energy system consultants), Elton Consulting (community consultation),</p>

	<p>Content Marketing (content development and marketing).</p> <p>The SERREE Industry Cluster has supported the Ginninderry Microgrid project by providing Riverview Projects with access to grant funding through SERREE's current funding agreement with ARENA.</p> <p>This funding was used to undertake a social research project to explore the uncharted dimension of people's assumptions, expectations, perceived benefits, reservations and objections towards renewable energy systems and the proposed microgrid.</p> <p>There are a number of other organisations currently working on testing and implementing microgrid solutions e.g. Ovida - Community Energy Hub Project, Euroa Microgrid</p>
Sources/ resources	<p>Totally Renewable Yackandandah</p> <p>Link: http://totallyrenewableyack.org.au/about/100-renewable-by-2022/</p> <p>Link: Creating the Yackandandah Community Mini Grid Report</p> <p>Ginninderry Microgrid</p> <p>Link: http://www.serree.org.au/projects/ginninderry-microgrid/</p> <p>https://ginninderry.com/wp-content/uploads/2016/09/Ginninderry-2017-Householder-Attitudes-to-Residential-Renewable-Energy-Futures.pdf</p> <p>Tyalgum Microgrid project – feasibility study</p> <p>Link: http://sustainnorthernrivers.org/wp-content/uploads/2015/09/Tyalgum-final-report.pdf</p> <p>ACT Net Zero Precinct Summary</p> <p>Link: Summary of Net Zero Precincts for ACT</p>

8. Rates finance		Aggregated Household Models
Description	<p>Rates-based finance is mediated through local government. The repayment is enabled through a special charge or rate levied on the property and paid by the occupant through normal rate repayments. Usually (though not always), the upfront finance used to purchase and install the renewable energy system is not local government money, but is sourced through an external financier. Rates-financing can theoretically be used to support any property to undertake clean energy or environmental upgrades. However, given the growing number of finance products available through more traditional sources e.g. banks, we suggest that rates -financing is most useful for households that face significant barriers (market failures) to accessing clean energy i.e. low income households and potentially renters and their landlords</p> <p>Solar Savers is a type of rates-based finance used by Darebin, Adelaide and some other Councils.</p> <ul style="list-style-type: none"> • Council funds the scheme via a low-interest loan • Suppliers submit tenders (bulk-buy prices) that meet high quality and warranty requirements • Homeowners pay Council for their solar installations via a special charge on their rates over 10 years • Solar recipients get generous immediate savings and ultimately 'free' solar that has paid for itself <p>The main form of rates-based financing currently being pursued in Australia is Environmental Upgrade Agreements (EUAs) for commercial buildings. EUAs are allowed under special amendments to the Local Government Act in NSW, Victoria and South Australia. However, so far there have only been a few uses of the mechanism (seven in Victoria and five in NSW, two in South Australia).</p>	
Impact/ outcome	A model to support low income households to access solar and possibly energy efficiency.	
Strength in the Inner West context	Low income households owning their own house would benefit from this scheme.	
Challenges in Inner West context	In NSW the Local Government Act only allows Environmental Upgrade Agreements for commercial buildings. Community organisations or residential buildings are not considered (yet).	

	In addition, implementing rates based schemes will require administrative support to establish a scheme and process rates charges over time. For the scheme to be both effective for participants and efficient for Councils, there needs to be a clear process for establishing participant eligibility, lender and supplier accreditation, and routine collection and processing of payments.
Role of council	<p>The main role for council is to advocate for legislative changes to include residential and community properties in the Environmental Upgrade Agreement scheme.</p> <p>In collaboration with other councils, form request to the NSW state Government which could be include:</p> <ul style="list-style-type: none"> • Review of the Local Government Act and assist legislators in their redrafting of the Act's provisions relating to the use of rates charges • Assist councils and other partners to design and establish a 'shared service' to deliver large scale solar rates programs such as in Victoria
Speed of implementation	Medium to long, since changes to the Local Government Act are necessary in NSW
Case study examples	<p>Darebin Solar Saver: The City of Darebin's Solar Savers program has successfully employed a special rates mechanism to deliver solar to more than 300 households across the municipality. In doing so, the council identified a mechanism to help pensioner and low - income households access the benefits of on-site solar photovoltaic (PV) power, reduce their daytime electricity costs and contribute to climate action through renewable energy generation in Victoria Greenhouse Alliance Solar Savers.</p> <p>The model has been already implemented by a number of Victorian councils and is enabled by the state's Local Government's Environmental Upgrade Mechanisms or Special Rates mechanism for residential buildings (neither are available in NSW)</p>
Sources/ resources	<p>Link: https://eaga.com.au/projects/solar-savers/</p> <p>Link: http://www.darebin.vic.gov.au/Darebin-Living/Caring-for-the-environment/EnergyClimate</p> <p>ACT Low Income Households Program https://www.actsmart.act.gov.au/what-can-i-do/homes/Actsmart-household-solar-for-low-income</p>

Developer Partnership Models

9. Off-site PPAs with community investment		Developer Partnership Models
Description:	In this approach a community group partners with a commercial energy developer (or similar organisation) to deliver a community energy project. There are only a few examples of community-developer partnerships in Australia. ClearSky Solar in Sydney is one example where a community group partners with a solar developer to implement solar projects across Australia. Another example is the Sapphire Wind Farm in northern NSW which is pioneering Australia's first community co-investment into a large-scale wind farm.	
Impact/ outcome	There is a potential for high impact in terms of renewable energy generation (kW/MW) and CO2 reduction. Supports the growth of the renewable energy industry and jobs in regional Australia.	
Strength in the IW context	Interest in sustainability and renewable energy generation and a population that is reasonably affluent and as such there could be significant community interested in investing/participating in such a program. Strategic vision and goals of Council.	
Challenges in IW context	In early October SSROC councils including Inner West signed up to a PPA to take the output from the Moree solar farm to reduce their electricity bills by around one third from the middle of 2019. Hence it is doubtful that further PPAs will be implemented in the near future.	
Role of council:	Council could consider PPAs with community-developer partnership projects e.g. large solar or wind farms. If Council is entering into negotiations for a PPA for new renewable generation, then it could include a provision to open up to partial community ownership for Inner West residents and ensure requirements in regard to community participation and engagement (obtained social license) are met by the developer.	
Speed of implementation	Medium to long	
Case study examples	<p>ClearSky Solar</p> <p>A very successful model has been developed by ClearSky Solar. This organisation has undertaken 11 projects with more than 425 kW installed. The community group emerged as a local chapter of the Clean Energy for Eternity Association established during the heights of the climate movement in 2006. In their model, community investors form a trust which then provides a loan to a solar company who owns and operates the solar PV installation on behalf of the host site (e.g. the Boggabri Pub).</p> <p>Sapphire Wind Farm</p> <p>The approach by CWP Renewables (the developer) was guided by the aim to build long-term community support for the project and test innovative ways to differentiate from competitors by "leading the pack in community engagement" (CWP Head of Development, Ed Mounsey cited by Holmes a Court in The Guardian 2018).</p> <p>The project is different from other initiatives, in particular regarding the co-investment opportunity for predominantly local and regional investors. Co-investment refers to a structure where a community investment vehicle buys rights to a portion of the earnings of the wind energy project but has no decision-making power or control over the operation of the asset. In the case of Sapphire Wind Farm, an investment offer will be made by the company to the community who will be considered just like another funding partner. The benefit for the community members is direct, and offers low-risk access to large-scale investment promising 5-6% floor rate of return. The return would be linked to the performance of the wind farm as a whole rather than one individual turbine. The share offer is expected to open this year with a minimum investment of \$5,000.</p>	
Sources/ resources	<p>Link: http://www.ClearSkysolar.com.au/index.php</p> <p>Link: https://www.sapphirewindfarm.com.au/</p> <p>Link: https://www.melbourne.vic.gov.au/business/sustainable-business/mrep/Pages/melbourne-renewable-energy-project.aspx</p>	

Appendix 2

Waves of Community Energy

Wave	Example project	Reason	Barriers	Outcomes	Primary policy advocated for
1. Bulk buys 2006 onwards	Climate Action Newcastle Solar Bulk-buy (2007)	Make rooftop solar more accessible & help scale up	Cost of solar	Many more early adopters of solar Community working together on clean energy	Feed-in tariffs
2. Community owned wind and solar - MW scale 2011 onwards	Hepburn Wind (operational 2011)	This is how it's done overseas Local opposition to a nearby large wind farm	\$\$\$ for pre-construction costs Completely new idea Capital raising during the financial crisis Grid connection No policy support for community energy like in other countries Negotiating a good PPA – was very hard when LGC price crashed and wholesale price was low	Two community owned wind-farms Flagship projects that inspired the growth of the community energy sector Largest per-MW community benefit fund Increased support for renewables More community energy activity Community energy investment Lower bills for nearby neighbours Increased energy literacy Sense of community pride Sustainable investment for lots of people More tourism	Milestone-based grant funding to get projects to financial close
3. Behind the meter solar and some energy efficiency 2013 onwards	ClearSky Solar – Boggabri Pub (operational 2013) Repower Shoalhaven – Kangaroo Valley Fire Station	The only financially viable model that would give a return with minimal grant support. Relatively simple to administer	Finding a good host-site & negotiating a win-win deal Still a new idea Covering legal costs Business model is marginal	Replicable model of community solar Two part-time staff employed Sustainable investment for a few people Lower/more certain bills for host sites Sense of community pride Renewables deployed Increased energy & financial literacy	Smallish start-up grants (<\$100k) Capacity building support e.g. Congress
4. Whatever works –	Enova	Communities wanted to innovate and do more –	Finding funding to get started or keep going	Many	Smart Energy Communities Program:

<p>ecosystem of models - partnerships/multiple approaches aggregated/retailing</p> <p>2015 onwards</p>	<p>Z-Net Uralla</p> <p>Sapphire Wind</p>	<p>did what they could do with limited support and within regulatory/ policy constraints</p>			<ul style="list-style-type: none"> - State-wide capacity building network - Regional energy hubs (MEFLs across Australia/NSW) - Grant funding for community energy projects
<p>5. Social access* ~2017 onwards</p>	<p>Stucco</p> <p>Darebin Solar Savers</p> <p>CORENA/Uralla tenants trial</p>	<p>Community energy groups have a commitment to social justice – want to help address fundamental barriers</p>	<p>Models more complex so don't stack up by themselves (must overcome fundamental market failures like split incentives)</p> <p>Limited or no government support</p>	<p>Locked out and disadvantaged energy users (e.g. low-income households, renters, people who live in apartments) can access the benefits of clean energy</p>	<p>Funding to establish the model</p> <p>Rebates or similar to make the model cost-effective for locked-out energy users</p>