Opportunities for Community Energy in Inner West City Council

Authored by Community Power Agency

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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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Content

Community Power Agency

Executive summary

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

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

Community Power Agency has analysed 12 community energy models and programs assessing their appropriateness for the Inner West. Consideration was particularly given to speed of implementation, visibility, and environmental and social impact. From this list, Council identified 5 options that it is interested in investigating further. These options are summarised in Table 1.

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

Models	Projects	Short Description	CPA assessment
Investment model	Investment projects	Community initiated renewable energy projects that are funded by community investors	*Speed of implementation:* short to medium *Visibility/ outreach:* medium to high *Direct kW/ CO2 impact:* low to medium *Social inclusiveness:* low to medium *Overall IW:* 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.
Donation model	Revolving fund	Provide zero interest loans to non-profit organisations and the broader community	*Speed of implementation:* short to medium *Visibility/ outreach:* medium to high *Direct kW/ CO2 impact:* medium (depending on the funding and lifetime, the ultimate sum of all projects could have high impact) *Social inclusiveness:* medium to high *Overall IW:* set up and staff a revolving fund – start by targeting NFPs and consider expanding in the second year to low income households)
Aggregated household model	Solar Gardens	Solar PV system located off-site and the household receives a financial benefit on their bill.	*Speed of implementation:* medium *Visibility/ outreach:* high *Direct kW/ CO2 impact*: depends on the size of the Solar Garden(s) *Social inclusiveness:* high *Overall for IW:* 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.
	Education programs and events	Info-session, individual consultations as well as workshops on the latest clean technology updates.	*Speed of implementation:* short to medium *Visibility/ outreach:* high *Social inclusiveness:* medium *Direct kW/ CO2 impact:* low (could be medium depending on the design)

			Recommendation for IW: Increased promotion, support and visibility of existing initiatives such as Our Energy Future and the Green Living Centre.
	Apartment microgrids	Embedded electricity networks, which serve multiple premises.	*Speed of implementation:* medium to long *Visibility/ outreach:* medium *Direct kW/ CO2 impact:* medium *Social inclusiveness:* depends on the initiator – could be high *Overall IW:* 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.

If Inner West Council wishes to establish itself as a leader in community energy, we recommend Council focus its efforts on Options 1 to 3. Option 4 and 5 should be considered as additional actions 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 6 months. Moreover the Solar Garden option particularly involves a certain degree of risk, but would make Council stand out as pioneer in the Australian renewable energy space.

1. Introduction

The 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 2010 years, to more than 105 groups and 90 operating projects today, the community energy sector in Australia is growing quickly.

Roles of local governments in renewable energy deployment

Councils 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 the fact that energy generation is not part of their formal portfolio of responsibilities. Nevertheless, community enthusiasm and the opportunities that come with new technologies, have LG pursuing renewables projects both for their own needs and those of their community.

National or state government inaction to tackling 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.

In fact, 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.

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

Table 2: Typology of LGs 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 of green energy and undertaking 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 educate 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 to reliable suppliers
4. LG engagement as innovators and participants	Councils actively drive and promote RE engagement to their communities through innovative programs e.g. rates based finance of RE deployment
5. LG engagement as catalysts and supporters	Councils catalyse 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 incl. 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 renewable energy deployment, the institutional environment and energy policy context pose significant challenges. Hence LGs appear as natural allies that can help advance and accelerate local clean energy action.

Introducing Community Renewable Energy

Defining Community Renewable 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 the community needs, availability of local natural resources, technologies and funding, and community support.

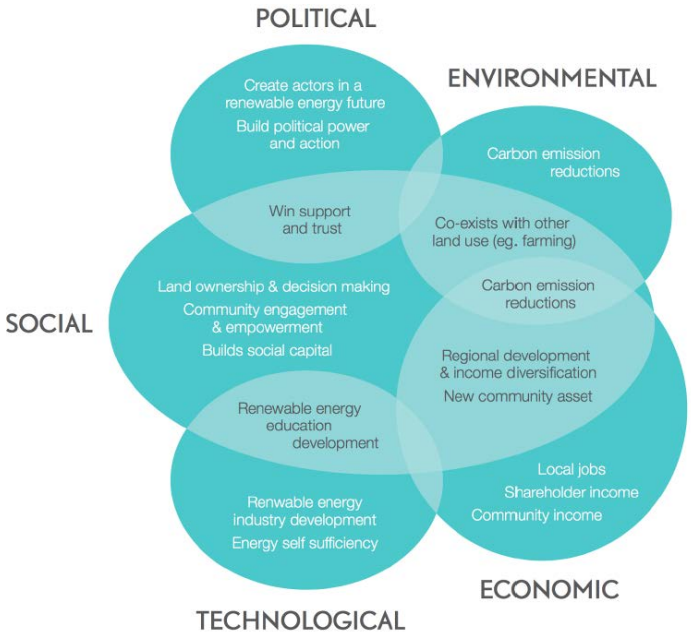
Community energy projects often allow individuals to be involved in clean energy beyond the bounds of their own home or business and in so doing bring a range of benefits and opportunities for their household and for the wider community. Community energy enables collective action, which can go beyond 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).

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 those elements at the beginning of a specific project direction. This will ensure that the motivators ultimately translate into benefits the project is going to seek.

Figure 1: Motivators and benefits of community energy



Source: Hicks, J. & Ison, N., 2012.

Council community energy leadership

While many councils are already sustainability leaders in areas of waste, water, community engagement and more, renewable energy represents a new field that Councils can embrace and 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 LGs in the community energy space include:

- The City of Sydney – has supported Pingala, Young Henrys and Stucco with grant funding enabling the implementation of their community energy projects.
- Darebin City Council – has 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 – has created Australia's first Council operated and community funded solar farms, and
- Moreland City Council – has 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 LGs have all recognised that community energy can help them achieve their community sustainability and climate goals. However, doing so has required:

1. A commitment to innovation, trying new things and thus an appetite for risk, and
2. A willingness to consider more than the bottom line. For example the Lismore community-council solar partnership would not have been possible if Lismore Council had assessed the project purely on financial terms.
3. An internal champion with enough resources and support to drive initiatives forward
4. Different Council teams to better coordinate and share information for example, the environment/energy, community and 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 LGA.

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

- How does the initiative/model 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 models and project examples are listed in Appendix 1 and are structured under the following four main categories:

- Aggregated household models
- Donation models
- Investment models
- Partnership models

It has to be noted that considering the definition of scope (Box 1), this report will not include models and projects that are (exclusively) led or advanced by commercial actors, though benefiting the community.

The report is structured as follows:

Section 2 is focussed on the status of clean energy in Inner West Council area and its sustainability vision and strategies.
Section 3 comprises an overview of community energy challenges and opportunities in general and specifically for the Inner West Council area, including local CRE initiatives.
Section 4 offers a summary of the recommendations which are derived from the list of options listed in Appendix 1.
Section 5 provides detailed explanation of the recommended and selected options

2. Status of clean energy in 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, on the one hand it is focussed on council's own electricity consumption and carbon footprint and on the other hand it facilitates 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 generating 316 kW at Council facilities including pools, libraries, childcare centres and offices. It is also working towards retrofitting all Council-owned buildings with solar PV. Council has also entered into a Power Purchase Agreement (PPA) with Moree solar farm to procure4127MWh of solar power each year, approximately equivalent to councils 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. This means there is need for more support and action on the part of council to overcome the challenges of high levels of renting and apartment living to renewable uptake. However, as the Inner West Council faces similar challenges to other metropolitan councils, there is the possibility of partnerships and joint learning.

Solar PV Capacity in Inner West LGA

- 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)

Australian PV Institute, 2018

Council clean energy programs

To take advantage of the unused potential and to make it easier for the broader community to act, the Council has initiated a number of programs, including:

- The 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 Futures in June 2017 (Ison et al., 2013; Our Energy Futures, 2018)). The Program is delivered by social enterprise Positive Charge and offers quotes from trusted suppliers and detailed advice on solar installation and systems for residents, council staff and small to medium businesses. It ensures that the customers receive tailored free advice from trusted installers on energy efficiency and renewable energy (Our Energy Futures, 2018).
- The Council's Green Living Centre, which played an early role in supporting and brokering Pingala and Young Henry's 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 and the Australian Photovoltaic Institute, Council wants to ensure that the Inner West potential is mapped to inform its residence (households, businesses etc.) about the individual solar rooftops potential. This is done via the online tool SunSpot that makes it easy for individual property owners to calculate how much electricity and money could be saved by installing a solar 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 with clean energy initiatives e.g. Marrickville Youth Resource Centre's Solar and Beyond project, Addison Road Community Centre and other local P&Cs
- In-kind support for local community energy groups – IWCEG, 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).

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

3. Community energy challenges and opportunities in the Inner West LGA

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, 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 Inner West Council specifically.

1. *Finding an appropriate host site:* Most CRE projects currently operate behind the meter and below the load to be economically viable. Hence project sites have to meet a number of technical criteria (with suitable load profiles) to be worth considering. In addition, the owners

of the host sites will have to be motivated by more than commercial success since the interaction with the community group as well as the broader community 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 a lack of resources. Technical feasibility studies and legal advice are needed to determine the viability of CRE projects. These can be rather 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 from business models, to contract negotiation, scaling solar systems, to community engagement. This takes time and practice, which is harder 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 and may act as a barrier to installing solar.

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

Opportunities

Inner West Council area has a relatively young and better educated population than 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. This also means that a greater concentration of higher density dwellings is likely to attract more young adults and smaller households, often renting.

Hence the socio-demographics of the Inner West provide fertile ground for community energy activities which offer both social and environmental solutions. Particularly younger people who are in rental accommodation and hence can't put solar on their roof are a suitable target group 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). In addition many of them are not registered for GST and hence are missing in traditional statistical counts. It is estimated that the real number of businesses of all sizes is closer to 28,000. These very small organisations and businesses could particularly benefit from solar, as they will have higher daytime consumption than most households.

Supporting this target audience would have the duel 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 great number of associations and cooperatives as shown in Table 4. These organisations could be very interested in and first contacts (e.g. promotions) for Council's (extended) offerings regarding community energy.

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

There is also a clear appetite for clean energy innovation in the Inner West, evident by the fact that there are a number of CRE groups and initiatives in the area.

Pingala

One of the local groups is Pingala, a dual organisation combining both a not-for profit association and a cooperative, which works with local businesses and organisations to install solar farms on their roofs (Pingala, 2018). Pingala operates in the Inner West LGA 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 initiative Our Energy Future 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 through Positive Charge and provides advice, services and products to households and businesses through answering phone calls, responding to online enquiries, and 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).

Other initiatives in the Inner West

There are other organisations and community energy initiatives within or in close proximity to the Inner West LGA. They include:

- *Stucco,* a student housing cooperative at Sydney University, has demonstrated how solar–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 additionally topped up by electricity from the grid. 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 is a new social enterprise located in ChippendaleSydney 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 the 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) .
- *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). This is consider community energy since it is driven by a not-for-profit organisation in collaboration with a commercial entity 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). Since not every community organisation will have the money or will easily receive a grant to cover the high upfront costs, there is great potential for councils to adopt initiatives such as this. Inner West Council could adopt the scheme using a low-interest loan as their revolving fund or Council reserves and potentially extend it to a broader audience in the community.

4. Analysis of community energy options

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

The criteria for assessing the viability, feasibly 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 potentially expected impacts and exposure of the initiative(s)/ project(s) to stand out in a crowded market of local, regional and national activities. It is focussed on brand recognition, rising public awareness, driving public engagement and ultimately helping to increase the trust in Council activities. The three levels considered are low (little and very localised impact) medium (fair amount of public involvement and awareness creation) and high (great potential to ensure broad public participation, and to increase brand recognition);
- *Direct kW/ CO2 impact* stands for the potential of the initiative/ project 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/ project to address systemic barriers and actively included 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 equally include disadvantage groups), medium (some capacity to include disadvantaged groups) and high (great potential to include a broad audience incl. disadvantaged and marginalised groups).

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

Table 5: Summary of community energy models

Models	Projects	Short Description	CPA assessment
Aggregated household model	Bulk Buy projects	Aggregate power of community buyers to purchase (a) product(s) at a discounted price.	*Speed of implementation:* short to medium *Visibility/ outreach:* medium to high *Direct kW/ CO2 impact:* medium *Social inclusiveness:* low *Overall for IW:* Initiatives are already underway. Promote existing efforts rather than compete.
	Solar Gardens	Solar PV system located off-site and the household receives a financial benefit on their bill.	*Speed of implementation:* medium *Visibility/ outreach:* high *Direct kW/ CO2 impact*: depends on the size of the Solar Garden(s) *Social inclusiveness:* high *Overall for IW:* 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.
	Education programs and events	Info-session, individual consultations and home energy assessments as well as workshops on the latest clean technology updates.	*Speed of implementation:* short to medium *Visibility/ outreach:* high *Social inclusiveness:* medium *Direct kW/ CO2 impact:* low (could be medium depending on the design) *Recommendation for IW:* Increased promotion, support and visibility of existing initiatives would add great value.
	Apartment microgrids	Embedded electricity networks, which serve multiple premises.	*Speed of implementation:* medium to long *Visibility/ outreach:* medium *Direct kW/ CO2 impact:* medium *Social inclusiveness:* depends on the initiator – could be high *Overall IW:* 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.
	Precinct microgrids	Embedded network on precinct/ community level.	*Speed of implementation:* medium to long *Visibility/ outreach:* medium to high *Direct kW/ CO2 impact:* high *Social inclusiveness:* depends on location could be high *Overall IW:* Pilot project, change planning instruments and approval process for new developments

Models	Projects	Short Description	CPA assessment
Aggregated household model	Rates-based finance	Finance for clean technologies is mediated through Council through special charges or rates levied on the property.	*Speed of implementation:* medium to long *Visibility/ outreach:* high *Direct kW/ CO2 impact:* high *Social inclusiveness:* medium to high *Overall IW:* Not possible in NSW yet, changes to LG Act required. Council could advocate with other councils to drive change
Donation models	Donation based model	Small scale crowdfunded projects for community organisations.	*Speed of implementation:* short *Visibility/ outreach:* medium *Direct kW/ CO2 impact:* low *Social inclusiveness:* n/a *Overall IW:* 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	*Speed of implementation:* short to medium *Visibility/ outreach:* medium to high *Direct kW/ CO2 impact:* medium (depending on the funding and lifetime, the ultimate sum of all projects could have high impact) *Social inclusiveness:* depending on the design – could be medium to high *Overall IW:* set up and staff a revolving fund – start by targeting NFPs and consider expanding in the second year (to e.g. low income households)
Investment model	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.	*Speed of implementation:* short to medium *Visibility/ outreach:* medium to high *Direct kW/ CO2 impact:* low to medium *Social inclusiveness:* low to medium *Overall IW:* 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.
Developer partnership model	Off-site PPAs with community investment		*Speed of implementation:* medium to long *Visibility/ outreach:* high *Direct kW/ CO2 impact:* high *Social inclusiveness:* low to medium *Overall IW:* If IW Council is entering into negotiations to do PPAs with a new large solar or wind farm then include a provision to open up to partial community ownership for Inner West and local residents.

Some of these models could be implemented in collaboration with other councils. This could have the advantage of sharing resources (including funding), knowledge and skills.

In addition to supporting these models of community energy, the Inner West Council could also put in place programs that support multiple models of community energy. For example, Council could 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. Council could set up a fund that would help to increase the capacity and resources of local individuals and

organisations to conduct community energy initiatives including renewable energy generation and energy efficiency measures.

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

1. Grants for community energy project feasibility studies;
2. Grants for capacity building and education of locals to engage in community energy activities; and;
3. Grants for Schools and other community organisations to access programs currently out of their reach and not covered by public funding; and
4. 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 1 or 2 times per year and be available to community organisations, clubs, and businesses.

As with any grant program, there would be a need to establish clear grant-making 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 fromthe private sector, community enthusiasm for renewables and government funding, to support access clean energy technologies such as solar and battery storage.

To start off, these Hubs would have staff with technical, legal, community engagement and finance expertise working to develop partnerships with funders, technology providers and other stakeholders to deliver 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, small business and more.

These Hubs would be connected to regional institutions such as councils and regional development organisations and would deliver programs that were relevant to their region. The Hubs 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 these Hubs would be to unlocking community energy projects. However, a well-designed Hub and support program could also address a range of barriers holding back a fair transition to clean energy, including:

- Access to a source of **impartial and trusted advice** on clean energy solutions. There is a huge amount 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, Australia's energy retailers are trusted less than the big banks (Clark, 2015). 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 accrues sufficient benefit from installing solar or energy efficiency measures to warrant doing so, leaving renters with ever higher energy bills.
    - High upfront costs, where low-income households typically cannot afford the outlay for many clean energy measures, although they would save money. 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 we show earlier in this report, is that there are models that can overcome these barriers, from social access solar gardens to rates-based financing.[1] The bad news is that these models come with their own set of challenges, namely higher complexity and thus high transaction costs. These socially beneficial models of clean energy involve multiple partner organisations, which add transaction costs, which in turn means these models are more expensive for end users. In addition, these models require a duty of care to vulnerable households and require significant face-to-face time to build trust. These models 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 models of clean energy.

A Regional Energy Hub in Practice – 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 $avers project installed solar on 300 low-income pensioners' roofs in Darebin (a suburb of north Melbourne). The participating households are 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.

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 small versions of the program and the Federal ALP and Greens adopting the policy (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 five initiatives were selected in a workshop with council staff on the 25th September 2018. The initiatives are presented in detail and with specific recommendations for implementation below.

1. Community investment model
2. Revolving Fund
3. Solar Gardens
4. Education and promotion
5. Apartment micro-grids

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 and 5 should be considered as additional actions 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 6 months. Moreover the Solar Garden option particularly involves a certain degree of risk, but would make Council stand out as pioneer in the Australian renewable energy space.

[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.

Community Investment model

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 investors-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 to do so. The community organisation following successful negotiation enter 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 investment projects are rooftop solar projects on commercial buildings operating behind the meter and below the load. 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 Zero emissions community objective.

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 brokers 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 you 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

The revolving no-interest loan fund concept has proven itself as a successful model of community energy through CORENA's Quick Win program over the last 5 years. In this model, funds are raised to provide zero interest loans to non-profit organisations. This structure results in a revolving fund, with donated funds being reused for multiple projects. The revolving fund loans can be offered to local households, not-for-profit community groups, public buildings and businesses. Overtime, as funds are re-paid, they can be loaned out to new applicants.

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

- Donations (crowdfunding) provide 'free capital'
- Ensures that the recipients can 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 with new donations new renewable energy and energy efficiency projects can be funded
- It works as long term initiative because the donated money is never 'used up'

Adopted by a council this model could work a little differently. Instead of seeking donations, we propose that Council takes out a low-interest loan to use as their revolving fund pool of money, or they might even use Council reserves for a small pilot program initially. Councils could easily build in 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 $200,000 will fund one new community solar project every 3 months. With $630,000 in the funding pool, one new project every month could be funded, forever. 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.

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

Strength in the Inner West context

Since Inner West Council area is home to a large number of community organisations (see Table 4) and small businesses (see Table 3) and there is great potential to support an initiative like this.

Council has the potential to provide institutional back up and/or run and implement it themselves with administrative and financial management. In addition, councils have access to (cheap capital) low or no interest loans, 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 STCs or LGCs as a condition of projects being eligible for funding.

Challenges in Inner West context

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

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 further details on the revolving fund establishment.
- **Step 2: Determine an implementation mode and identify its legal and financial requirements:** There are three options 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?
    - How could a viable and feasible business model for a revolving fund internally or externally administered look like?
    - Does Council have the capacity and resources to run the Fund internally? Could new 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 program?
    - Does Council have the capacity to also fund at least one staff person to administer the revolving fund program?
    - 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 in 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 Gardens is based on installing a central solar array, generally near a population 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).

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

There are currently no operating Solar Gardens 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 model 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 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 don't have the financial means to access new technologies. The statistics confirm the need to act. In 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 in Australia.

It is important to note that the Solar Garden's 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 and is currently developing a prototype Solar Garden business model.

Challenges in 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 sorted before implementing the first project. The Social Access Solar Gardens project is identifying what contracts 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.** Get in touch with 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 pilot of a Solar Garden. 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/ larger or 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 for a Council Solar Garden. This tool has been developed as part of the Social Access Solar Gardens project. This would allow the Council-led Solar Gardens team the ongoing ability to test different 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

[2] Note: we 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.

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 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.

Promotion, education and capacity building

Description

Promoting existing activities is an important strategy for informing, educating and engaging the Inner West community about existing community energy initiatives. To do this effectively requires a targeted approach. Council has great capacity to reach out to local households through newsletters, local events, social media, regular stalls at markets, the local newspaper and more. 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.

Strength in the Inner West context

Council has already a great number of initiatives which could be promoted through Council channels. The communication or media department in Council could provide the institutional back up to support these efforts.

With both the Green Living Centre and the Our Energy Future initiative, the 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.

Challenges in Inner West context

There is a need for a concerted internal Council approach to communicate and educate the local community about existing initiatives. This might require additional resources for staffing and conducting events, producing newsletters and other collaterals.

Impact/ outcome

Increased efforts in promotion and information sharing will help to raise awareness and engagement in Council initiatives and local community energy activities in the LGA.

Role of council

Engagement is a key element to achieve Inner West Council' zero emission goal and show leadership in sustainability.

Steps for doing more to promote community energy:

- **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 meeting 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.
- **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 trainings. 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.
  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.

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.

- **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.

Another option is to support the National Community Energy Congress to happen in Sydney

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

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 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 rorting 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 accessing 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 system for common areas	One solar system connected to the common areas. Provides power for lifts, HVAC, lights, garage fans, pools etc.	Simplest legally and technically	Small system No solar for residents	Council's DA requires 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 (eg. fridges, AC, electronics etc.) with any excess sold to the grid.	Simple legally Unambiguous technically 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	Maximise solar system Maximise savings	Difficult legally Challenging technically Require specialist advice & service providers	Rollout 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	Rollout Solar Gardens projects in the LGA

Source: Adapted from Sturmberg (2018).

Since the implementation of an apartment micro-grid is a legislative relative complex endeavour, we recommend that Council focusses on the following steps:

- **Step 1: Getting started**. Get in touch with Dr Bjorn Sturmberg 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 micro-grid
  - Engage with respective departments in council and determine ways how this could be implemented
  - Promote the idea with Councillors and get their support
  - Promote it to the community as another sustainability initiative of Council to meet its goal to become a zero emissions community

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Appendix 1

List of existing models and recommendations

Aggregated Household Models

1. Bulk Buy projects	
Description	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. 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. 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. 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.
Impact/ outcome	Community bulk-buys make it easier and more affordable to households, businesses and other organisations to adopt clean energy technologies. 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. Community member often receive substantially discounted material/ equipment as a benefit of the bulk-buying.
Strength in the Inner West context	In the Inner West LGA 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 ShinHub 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	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 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/ 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/
Sources/ resources	Embark Wiki Introduction to a bulk buy, setting up a bulk buy and promoting a bulk buy program

2. Solar Gardens	
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	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. Link: https://arena.gov.au/projects/social-access-solar-gardens/ Link: https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate/social-solar-gardens Enova's Solar Gardens model – behind the meter Link: https://enovaenergy.com.au/solar-garden/
Sources/ resources	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, *Facilitating the Introduction of Local Network Charges and Local Electricity Trading*. The project established that there was sufficient merit in the one-to-many LET model to warrant further and more detailed investigation. Links: https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate/social-solar-gardens https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate-3 The Energy Consumers Australia funded *Renewables for All* 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. Link: http://cpagency.org.au/renewables-for-all-resources/ There are additional examples from several US states, where the idea originally stems from enabled by their virtual net metering policy. Colorado has implemented one of the most publicized and recognized community shared solar program called Community Solar Gardens. Link: https://www.colorado.gov/pacific/energyoffice/community-solar Guide to Community Shared Solar: Link: https://www.nrel.gov/docs/fy12osti/54570.pdf

3. Education events and programs	
Description	*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.*
Impact/ outcome	*See main body of the report.*
Speed of implementation	Short to medium
Case study examples	Pingala is a volunteer led not-for profit organisation with the aim to accelerate a fair energy transition by putting customers first. Pingala's flagship project is about creating energy co-operatives that put the consumer as the prime beneficiary of the business, not shareholders. At Young Henrys Brewery they installed their first community solar investment project. In another project in partnership with The Valley Centre, Pingala continues to provide support to indigenous communities around Australia. Pingala is also involved in the Social Access Solar Gardens project and runs a bulk buy initiative in collaboration with Shinehub. Link: https://pingala.org.au/ Link: http://pingala.org.au/shinehub The National Community Energy Congress took place in 2014 and 2017 and provided great opportunity for the community energy sector to connect, learn and create new momentum to grow. The Congress is an initiative of the Coalition for Community Energy (C4CE) and takes place every two years. 2014 - Link: http://c4ce.net.au/congress./ 2017 - Link: http://c4ce.net.au/congress/
Sources/ resources	The C4CE website, Embark Wiki and Community Power Agency website provide useful resources and material to learn more about community energy. Links: www.c4ce.net.au www.cpagency.org.au http://www.embark.com.au/ Useful resources include: C4CE 2017 Small Scale Solar Guide: C4CE 2017 Webinars 2017 and 2018 Latest How to Guide for Community Owned Renewable Energy (for Victorians) NSW How to Guide for Community Energy

4. Apartment microgrids	
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	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 with six to seven years. 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.
Sources/ resources	Stucco: http://www.stucco.org.au/ https://www.suntenants.com/howitworks/ International example of Apartment Microgrid enabled through the New York State Homes and Community Renewal Link: https://onestepoffthegrid.com.au/glimpse-energy-future-new-york-launches-affordable-housing-microgrid/

5. Community microgrid	
Description	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'. 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 This rapidly emerging sector is of growing interest to a wide range of stakeholders including industry, energy utilities, regulators, policy makers, developers and communities.
Impact/ outcome	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.
Strength in the Inner West context	Council's Zero Net target makes it worthwhile considering precinct level approaches. 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. Population and housing density and the great number of commercial buildings in 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.
Challenges in Inner West context	Challenges come with the implementation of the microgrid on community level, which will require significant resources. In addition as mentioned above there are some uncertainties regarding the regulatory environment (e.g. every customer should be able to choose its own retailer - issues of 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.
Role of council	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. 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.
Speed of implementation	Long term
Case study examples	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. 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. 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), Content Marketing (content development and marketing).

	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. 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. There are a number of other organisations currently working on testing and implementing microgrid solutions e.g. Ovida - Community Energy Hub Project, Euroa Microgrid
Sources/ resources	Totally Renewable Yackandandah Link: http://totallyrenewableyack.org.au/about/100-renewable-by-2022/ Link: Creating the Yackandandah Community Mini Grid Report Ginninderry Microgrid Link: http://www.serree.org.au/projects/ginninderry-microgrid/ https://ginninderry.com/wp-content/uploads/2016/09/Ginninderry-2017-Householder-Attitudes-to-Residential-Renewable-Energy-Futures.pdf Tyalgum Microgrid project – feasibility study Link: http://sustainnorthernrivers.org/wp-content/uploads/2015/09/Tyalgum-final-report.pdf ACT Net Zero Precinct Summary Link: Summary of Net Zero Precincts for ACT

6. Rates finance	
Description	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 finance is not local government money, but is sourced through an external financer. 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 Solar Savers is a type of solar revolving fund used by Darebin, Adelaide and some other Councils. • 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 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).
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	The main role for council is to advocate for legislative changes to include residential and community properties in the Environmental Upgrade Agreement scheme. In collaboration with other councils, form request to the NSW state Government which could be include: • 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	Darebin Solar Saver: The City of Darebin's Solar $avers 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. 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)
Sources/ resources	Link: https://eaga.com.au/projects/solar-savers/ Link: http://www.darebin.vic.gov.au/Darebin-Living/Caring-for-the-environment/EnergyClimate ACT Low Income Households Program https://www.actsmart.act.gov.au/what-can-i-do/homes/Actsmart-household-solar-for-low-income

7. Donation	
Description	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. 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.
Impact/ outcome	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.
Strength in the Inner West context	Inner West Council area is home to a large number of not for profit organisations specifically from the health sector. 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. Ecofestival). The Green Living Centre could also be a place to host events and/or promote projects.
Challenges in Inner West context	There is great competition in the crowdfunding space with many organisations advertising for their good causes. Hence it is important for 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. Donation based community energy initiatives are often run by volunteers, which can lack capacities and resources.
Role of council	Council could promote donation projects in the LGA and also offer to match funding through community grants.
Speed of implementation	Short to medium
Case study examples	Repower Shoalhaven, Repower Shoalhaven is a volunteer unpinned 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 system. 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. Powershop's Your Community Energy Initiative gives customers the opportunity to pay higher rates in order to be distributed to renewable energy projects that were 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).
Sources/ resources	Small Scale Solar Guide: http://c4ce.net.au/strategic-initiatives/webinars-2017-small-scale-community-solar-guide/#donation Link: https://www.repower.net.au/projects.html Link: http://www.cleanas.org.au/hunter-wetlands-solar.html Link: https://www.powershop.com.au/your-community-energy/

8. Revolving Fund	
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	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 project 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. Link: https://corenafund.org.au/quick-win-projects/ Solar Savers Model is used by Darebin, Adelaide, and some other Victorian local councils and could be considered as one form of revolving fund but is specifically enabled through rates based re-finance. Please see rates based finance above.
Sources/ resources	Link: https://corenafund.org.au/clever-climate-economics-for-local-councils/ Link: http://www.darebin.vic.gov.au/Darebin-Living/Caring-for-the-environment/EnergyClimate

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

9. *Investment projects*	
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	Short to medium
Case study examples	Lismore Community Solar farm is an investment model as well as a community-council partnership model. Proprietary companies are established as 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. 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). 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.
Sources/ resources	Lismore Community Solar Link: http://farmingthesun.net/lismore/ and http://farmingthesun.net/lismore/business-model/ Other investment projects have been developed by: • Clear Sky Solar • Pingala • Repower Shoalhaven Another useful resource providing an overview of the different models is: Link: Small-scale Community Solar Guide/ version 2

10. Off-site PPAs with community investment	
Description:	In this approach the community group partners with a commercial energy developer (or similar organisation) to deliver a community energy project. There are only few examples in Australia which have implemented a community-developer partnership. 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 have signed up a PPA to take the output from the Moree solar farm to slash 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 open up to partial community ownership for Inner West and local 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	Clearsky Solar A very successful model has been developed by Clearsky Solar. This organisation has already 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 (eg. the Boggrabri Pub). Sapphire Wind Farm 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). The project differentiates from the 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 most likely an unlisted public company will be established, and an investment offer is made to the community which is ultimately considered just like another funding partner. The benefit for the community members is a simple and 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 later this year with a minimum investment of $5,000.
Sources/ resources	Link: http://www.clearskysolar.com.au/index.php Link: https://www.sapphirewindfarm.com.au/ Link: https://www.melbourne.vic.gov.au/business/sustainable-business/mrep/Pages/melbourne-renewable-energy-project.aspx

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 – Bogabri Pub (operational 2013) Repower Shoalhaven – Kangaroo Valley Fire Station	It was the only model that would stack-up financially and 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 the cost of legals Business model is marginal	Replicable model of community solar RS – two part-time staff Sustainable investment for a few people Lower/more certain bills for host sites Sense of community pride (sometimes) Renewables deployed Increased energy & financial literacy	Smallish start-up grants (<$100k) Capacity building support e.g. Congress

4. Whatever works – ecosystem of models - partnerships/multiple approaches aggregated/retailing 2015 onwards	Enova Z-Net Uralla Sapphire Wind	Communities wanted to innovate and do more – did what they could do with limited support and within regulatory/ policy constraints	Finding funding to get started or keep going	Many	Smart Energy Communities Program: - State-wide capacity building network - Regional energy hubs (MEFLs across Australia/NSW) - Grant funding for community energy projects
5. Social access* ~2017 onwards	Stucco Darebin Solar Savers CORENA/Uralla tenants trial Aboriginal community solar? Solar Gardens???	Community energy groups have a commitment to social justice – want to help address fundamental barriers	Models more complex so don't stack up by themselves (as overcoming fundamental market failures like split incentives) Limited or no government support	Locked out and disadvantaged energy users (low-income households, renters, people who live in apartments etc) can access the benefits of clean energy	Funding to establish the model Rebates or similar to make the model cost-effective for locked-out energy users